

Rhizomic Network Analysis: Towards a better understanding of knowledge dynamics of innovation in business networks

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ABSTRACT

There is a general consensus that networks and community interaction provide a critical mechanism for innovation. Of recent years we have seen a growth of interest in the role of social networks, partly fuelled by the fact that the contemporary business world has become more dynamic, complex and global. Today an increasing number of people work in geographically dispersed networks and across organisational boundaries. With this comes the need to re-think the ways in which innovation emerges across locations, enterprises and geographies and consequentially, how this can be analysed.

However, methods for the analysis of social networks have yet to better understand knowledge dynamics of innovation. It is argued for the need to (i) switch the unit of analysis from individuals' ideas to social construction of knowledge and (ii) use the Deleuzo-Guattarian rhizomic view on networks to reveal not only the dynamics of meaning creation, but also those of meaning disruption, both essential conditions for the emergence of new concepts. A new approach, Rhizomic Network Analysis (RNA) is explored, which aims to move analysis beyond mere description of relationship structures towards enabling the differentiation of the type of knowledge dynamics emergent. An example of an entrepreneurial business network is used to illustrate this approach.

Key terms: Knowledge dynamics, social network, innovation, social constructionism, Social Representations Theory, post-structuralism, Deleuze and Guattari, entrepreneurial business networks, Rhizomic Network Analysis (RNA).

INTRODUCTION

In recent years there has been a growth of online networking sites, and one area that is expanding in the use of these networks is the corporate environment. Businesses are beginning to use online networks as a means to connecting employees and helping them to build profiles. This makes them searchable and be connected to other business professionals. Specifically in e-business, since the dotcom crash¹ in 2000, new online business networks have attracted large numbers of entrepreneurs to sign up to their Web-sites. These are networks that connect entrepreneurial businesses by industry, functions, geography and/or areas of interest. Examples in the English speaking arena are Ecademy.com, Ryze.com and LinkedIn.com.

There is a growing interdisciplinary theoretical and methodological debate about ways in which communities and community interaction via networks can be best explained as a critical mechanism for innovation and knowledge management. On the one hand, there is general consensus that networks have gained a new significance due to the modern challenges of an increasingly complex and global world (e.g. Castells, 1996, Wittel, 2001). Yet, on the other hand, opinions are divided as to how social networks can be best captured analytically and understood in terms of the dynamics they engender for knowledge creation (e.g. Duguid, 2005, Snowden, 2005).

One of the central controversies revolves around Social Network Analysis as perhaps one the most influential research streams in modern sociology, information science and organisational studies on the study of social communities in and across organisations (Carley & Hill, 2001; Cross & Parker, 2004). It has brought forward an industry of methods, software and measurement tools and has provided various business applications of network analysis to describe and compare the structural characteristics of business networks across functional and geographical boundaries of organisations (Caldwell, 2006a; Caldwell 2006b; Chung et al., 2006; Krebs, 2005). It mainly stems from network theories that study of graphs as a representation of relations between objects (Borgatti & Everett, 1999). Social Network Analysis enables analysis of relation characteristics in networks, which, in turn, can provide insights into communication and information exchange structures and/or into the extent to which different functional organisational areas are integrated in terms of their information exchange processes.

Nonetheless, Social Network Analysis has been widely criticised for its one-sided structural and individualist perspective on knowledge, creating a very atomistic view on networks as aggregation of individuals and on knowledge creation as a series of interaction processes between people as 'knowledge unit holders'. These drawbacks have been well summarised by Weissmann (2000) in respect of organisation and society and by Snowden (2005) in terms of methods of analysis.

However, despite notable exceptions (Snowden, 2005), there have only been few attempts to forward alternative methods allowing us to generate insights into the social and dynamic characteristics of knowledge creation in networks. Despite strong arguments for the urgent need to better conceptualise the informal, social knowledge processes, and critiques of the economic underpinning view on knowledge (Duguid, 2005), actual alternatives that tackle the dynamic nature of knowledge in innovation are rare.

Perhaps the most prominent contribution in this arena has been made by social theorists concerned with organisational learning and knowledge creation in communities (e.g. Senge, 1990; Lave & Wenger, 1991; Brown & Duguid, 2001; Weick, 2002; Nonaka & Nishiguchi, 2001). Authors oppose individualist economic accounts of knowledge creation and argue that knowledge is created in inter-subjective, local interpretation processes in work practice (Weick, 2002). In a similar vein, with regard to networks, scholars argue that social knowledge creation processes need be located in the social practice of 'networks of interest' and 'communities of practice' (Duguid, 2005; Weick & Sutcliffe, 2001).

However, as this chapter argues, by leaving core meta-theoretical assumptions unquestioned, theorists have begun to lock themselves into a logical impasse about the ways in which we can think 'knowledge dynamics' of innovation. The argument is that a more fundamental shift in perspective is needed in order to capture the dynamics of knowledge in networks. If we are to provide explanations as to how social networks enable innovation, we need to switch from seeing knowledge dynamics as mainly driven by social interaction to the dynamic interplay between meaning creation and meaning disruption.

This chapter attempts a rebalancing in respect of the use of social networks in arguments of knowledge creation and innovation. Rhizomic Network Analysis (RNA) is introduced as an approach to the qualitative analysis of knowledge dynamics in social networks. In what follows, I outline the theoretical grounding as well as the analytical approach of RNA. I then illustrate the approach of RNA with the case of the business network Ecademy.

BACKGROUND

The approach of RNA is based on a study (Steinberg, 2005; Steinberg, 2006) that explored knowledge dynamics of innovation in e-business entrepreneurship networks. With regards to its theoretical claims, the following has been established:

1. Meta-theoretical assumptions with regard to the nature of knowledge are often taken-for-granted and thereby implicitly hamper research endeavours to better understand innovation. By meta-theoretical assumptions we mean epistemological and ontological assumptions that inform and structure critical enquiry and that shape theorising. Specifically to better understand innovation, the very meta-theoretical assumptions of the nature of knowledge dynamics, deeply engrained into contemporary theorising, need to be examined. By dynamics we mean the forces and motions, particularly the social, intellectual and/or physical forces that produce activity, movement and change.

2. The current paradigm of social theorising concerned with alternatives to the dominant individualist, static and structural views on knowledge creation has become somewhat trapped in a relativist, anti-realist paradigm of explaining knowledge creation through processes of social influence relations between subjects or between subjects and their social context. By and large, social theorists reject essentialist realism, that is, above all the assumption that knowledge exists in pre-existent units in human minds (DeLanda, 1998). However, the turn to context-driven, relational and cultural concepts has brought with it in an unquestioned fashion only one alternative: this is the assumption that

dynamic knowledge creation is patterned in dialectic influence relations. And this has created a closed and one-sided paradigm in its own right: any natural dynamic that is not patterned dialogically is thereby automatically excluded from analysis.

3. While it is acknowledged that the human dynamic of knowing is influenced to a considerable extent by physical forces of our embodied existence and the material world, this influence has rarely been examined beyond dialectic influence relations with the social environment. What is overlooked here is that dynamics in the physical realm might be patterned in different ways that may have a disruptive and creative effect on our knowledge.

Far from claiming that RNA will solve these meta-theoretical issues in their entirety, this chapter provides a humble first step towards better understanding knowledge dynamics of innovation by looking at the Deleuzian ontology of becoming to open up our explanatory repertoire towards the more irregular and discontinuous patterns in knowledge dynamics. The Deleuzian perspective provides us with a new way of thinking about the ways in which our very nature as biological beings, part and parcel of a material world, continually impinges on the social dynamics that bring forth new knowledge. The case of innovation serves to specifically scrutinise the notion of disruption. Innovation is not only a social dynamic of knowledge creation of new concepts but also the result of the disruption of social meaning in sense experience.

THE APPROACH OF RHIZOMIC NETWORK ANALYSIS: CENTRAL ASSUMPTIONS

RNA is an approach to analysing the knowledge dynamics of innovation in social networks. The method is based on post-structuralist and social constructionist assumptions with regard to the nature of new knowledge creation; specifically it looks at innovation as a dynamic of the creation of new concepts: it examines the dynamic conditions for the emergence of new concepts in a social network. RNA is based on (i) the notion of social construction of knowledge in processes of social representation (Moscovici 1967/1976, Moscovici, 1984) and (ii) the rhizomic view on networks by Deleuze & Guattari (1987b) which adopts particularly patterns of disruption as essential pre-conditions for dynamics of creation.

RNA holds that it is an essential condition for the emergence of innovation is that both social constructionist and rhizomic dynamics are present and well intertwined. It focuses analysis on encounters between the dynamics of meaning creation and those of meaning disruption. RNA examines these encounters in two steps. Step 1 considers whether dynamics of social construction and rhizomic dynamics are emergent. Specifically, it looks at (i) the extent to which a social reference system is formed and (ii) the extent to which a social network emerges as rhizomic. These two conditions are summarised in table 1. Both are based on two central assumptions about the nature of innovation as a phenomenon of dynamic knowledge creation. Step 2 then looks at the extent to which these two conditions, if present, encounter each other (see figure 1).

	Condition 1	Condition 2
Network	Extent to which a social reference system is formed	Extent to which network is rhizomic
Focus of analysis	Dynamics of social construction	Dynamics of assemblages and disruptions

Table 1: Conditions for the emergence of new concepts

In what follows, these two steps will be outlined in terms of their theoretical and meta-theoretical grounding as well as their positioning in relation to dominant theorising on knowledge and knowledge creation. This is followed by an illustration of RNA using the example of Ecademy.

STEP 1 - Conditions for the emergence of new (socially shared) concepts

Condition 1: Dynamics of social knowledge construction

The first condition for the emergence of new concepts is the extent to which networks emerge as social reference systems. By social reference system we mean a community, in which meaning is shared and continually re-created. With this, RNA recognises that innovation is partly a phenomenon of social knowledge creation and switches the unit of analysis from individuals' ideas in isolation to the social construction of knowledge. For novelty to emerge as an innovation - as an innovative new concept - in the social realm, people need to experience it by collectively making sense of it in communicative interaction.

What does it take to generate an innovation? The desire to seek something new, the satisfaction of finding something, is inextricably linked to sharing, debating and co-constructing the meaning of these findings with others who also recognize them as new. This is what RNA hones into: the process of socially constructing meaning about a novelty is a key ingredient for innovation. If a novel phenomenon does not become socially accepted as an innovation, it remains unknown and unacknowledged. But not only entirely novel phenomena can become innovations; social construction is even more central in cases of innovation where it was not an entirely novel phenomena that triggered it, rather a new ways of sense-making of an existent phenomenon.

Think, for instance, of the new-ness that the World Wide Web has introduced. Its innovative character is not merely constituted by the technological invention of the Internet; this has existed long before the actual rise of the concept of online communication. The innovative character of the World Wide Web was rather inherent to what Castells (1996/97) described as the emergence of a new logic of time, space and interaction around the Internet; the novel ways in which actors, information, commodities and capital travel along new routes and connect in novel patterns. Hence, the innovative character of the World Wide Web can be better understood by looking at the ways in which the new world of concepts and ways of sense-making around the Internet emerged; the way in which worldwide technological connectivity was taken up and made sense of by people collectively.

With this focus on social construction, RNA counters classic individual-centred assumptions on the nature of innovation, widespread in contemporary theorising. A critical look at contemporary perspectives of innovation, both in economic and psychological literatures, highlights a view that assumes knowledge to originate primarily in units in individuals' minds. New knowledge creation is often causally attributed to new ideas conceived by individual entrepreneurs.

Mainstream economic theorising centrally features the individual entrepreneur as the main unit of analysis with regard to knowledge creation in innovation. Both Keynesian and neo-classic economic theory portray the entrepreneur as an agent of change whose special abilities drive innovation in the economy (Holcombe, 1999). In this literature, the entrepreneur is portrayed as an individual with special qualities that are beneficial for economic growth and innovation (Bassetti, 2003; Bolton, 1971; Brockhaus & Horwitz, 1986; Storey, 1982): knowledge creation is implied in concepts of traits and qualities of entrepreneurs.

An example of a model that is often drawn on in this context is the knowledge-attitude-belief (KAB) model based on the theory of reasoned action (Ajzen, 1985; Ajzen & Fishbein, 1980). This is still today one of the most widely adopted psychological models in business and policy research on knowledge creation², postulating a linear relationship between people's individually held knowledge, attitudes and behaviour; with mental constructs such as attitudes seen to be the triggers of action. Economic theories drawing on psychological models such as these suggests that better individual knowledge will lead to new ideas and thus innovation.

More recent conceptualisations of knowledge creation take a more social approach, looking at how innovation is created in communities and networks. Authors turned away from studying the individual as main unit of analysis, arguing that the emphasis placed on the qualities of the individual has been exaggerated (Filion, 2003). Some have adopted an ecological approach, looking at communities and clusters of organisations and their patterns of interaction when innovating (Aldrich, 1999; Mezas & Kuperman, 2001; Aldrich & Zimmer, 1986). Similarly, situated cognition theorists argue that knowledge creation is 'situated' in social context, that doing and thinking are intertwined and affect one another (e.g. Brown et al., 1989; Clancey, 1994; Lave & Wenger, 1991).

Others look at the impact of modern changes in the nature of social relationships on innovation. The core notion is knowledge dissemination and the argument is that in today's digitised, globally networked and knowledge-centred economy (Chell, 2000; Quah, 2003; Shane, 2000) it is paramount for successful innovation that ideas can diffuse more rapidly and more widely (Agre, 1999; Wittel, 2001; Castells, 1996). The aim is to better understand the contemporary nature of social relationships in order to explain the extent to which an idea can disperse widely throughout society (Bjornenak, 1997; Quah, 2003; Chell, 2000).

Despite this timely shift in perspective towards a social perspective, in a similarly unquestioned fashion as in economic orthodoxy, knowledge is taken to exist in 'items' (e.g. Quah, 2003) that are equated with economic commodities such as money, labour, and land (Stacey, 2000). Knowledge is typically spoken of as though it were all of a

piece; a stable entity-like item that people possess; pre-given, as if it had been in this piece forever; and unified, that is, as though essentially knowledge comes in only one kind. A rational and functionalist view on knowledge is taken (Smircich, 1983), which portrays knowledge as a pre-existent economic resource that can be controlled by humans. It is also a view that is similarly to classic economic theories locating these knowledge units into the minds of individuals.

Opposing this exclusive focus on the individual, RNA draws on the theory of social representations (Moscovici, 1961/1976; Moscovici, 1984) to argue for knowledge dynamics as driven by social construction. Developed by Serge Moscovici in the 1960s as a theory for 'the study of social knowledge' (Moscovici, 2001, p. 9), social representations theory locates knowledge creation at the interface between the individual and the social. The theory rejects the Cartesian tradition of assuming the individual mind as the location of knowledge creation by adopting a Hegelian dialectic approach of creation in order to introduce 'a new synthesis between the individual and the social' (Deaux & Philogène, 2001, p. 5).

At the centre of social representation as a dynamic dialectic process of social influence stands the creative force of the unfamiliar. Duveen (2000) called this the power of new ideas. Moscovici suggests that when people are presented with the unfamiliar, as for instance in 'competing versions of reality' (Rose et al., 1995), or in different 'stocks of knowledge' (Flick, 1998), this is perceived by people as a threat (de-Graft Aikins, 2004) and therefore people are 'under the compulsion' (Moscovici, 2000, p. 50) of anchoring and objectifying³ the unfamiliar in the familiar. In other words, the theory argues that in response to the challenge of the unfamiliar, people familiarise the unfamiliar and thus create new knowledge by socially re-negotiating (re-presenting) it in a new way (Moscovici, 1984).

The study of social representations offers a framework for studying knowledge 'in-the-making', directing attention to the continual re-construction and adaptation of shared concepts in response to the novel (Moscovici, 2001). From this perspective, the driving force of social knowledge dynamics can be understood as the evolution of new meanings in everyday communicative interaction (Flick, 1998), triggered by the need to re-negotiate familiar concepts against unfamiliar, challenging ones in social interaction (Moscovici, 1984).

This perspective provides us with a handle on examining how a community reacts to novelty. This is why RNA looks as a first condition of innovation at the extent to which a social reference system is emergent in a network. Crucially, this will allow us to diagnose how a community is likely to deal with a novelty. If a community handles novelty well in that it can be integrated flexibly into the existing set of core meanings then there will be a higher likelihood for new concepts to emerge.

Analytically, RNA establishes this by (i) identifying the core meaning system by means of thematic analysis of data from communicative interaction. Analysing themata means identifying the central shared concepts, the central, most stable and familiar meanings shared by a social community (Moscovici & Vignaux, 2000). They are the main evaluative dimensions of sense-making used by a community of people as they are well-known, highly familiar social references, perceived as universally justifiable⁴; (ii) RNA then looks at the extent to which this system of themata is open or less open to change,

looking at the ‘why?’ and ‘how?’ of recent or sudden changes in these themata, seeking to identify challenging or novel phenomena that change was in response to. I will illustrate this procedure methodologically at a later point by using the example of Ecademy. But first, let us consider the second condition of RNA in terms of innovation.

Condition 2: Rhizomic dynamics of assemblages and disruptions

The second central condition for new concepts is the extent to which a network is ‘rhizomic’. The term rhizomic refers to Deleuze’s and Guattari’s (1987b) notion of the rhizome as an approach to thinking about networks as discontinuous becomings⁵. Deleuze and Guattari assume that what is given to us in experience is not a world of pre-defined beings (essences) but intensive processes of spatio-temporal dynamics (becomings) (DeLanda, 1998). This directs attention to the potentialities of becoming: to novel, spontaneously emergent, unexpected connections between seemingly disparate events or phenomena.

Deleuze developed the notion of the rhizome together with his co-author Guattari in his later work; it is especially featured in their seminal work ‘A Thousand Plateaus’⁶ (Deleuze & Guattari, 1987b). The rhizome is an analogy, looking at networks as phenomena of creation – as phenomena that create multiplicity and expanding complexity in discontinuously overlapping connections (Deleuze & Guattari, 1987b). Based on the image of the underground ‘hidden’ wanderings in plants’ roots (Wood & Ferlie, 2003), Deleuze and Guattari see creative dynamics in networks emergent from the growth and movement of rhizomes; in their view, creative ‘becoming’ is patterned like the wanderings of a rhizome⁷. From this perspective, creation emerges from unusual assemblages - combinations, mergers, incorporations and associations, which are only to a little extent tied to existing cultural meanings or relations (Deleuze & Parnet, 1987).

By looking at networks as rhizomic phenomena of becoming, RNA counters that knowledge dynamics are exclusively patterned in a predictable way by social influence relations. As has been shown elsewhere (Steinberg, 2005), it is not sufficient to assume the driving force for innovation lies exclusively in the social realm of epistemological creation. Rather, the dynamics of social construction need to be seen in relation to the continuous movement and creation in the embodied and physical world.

While a focus on social knowledge construction clearly takes a dynamic perspective on the emergent character of knowledge, and while social representations theory views knowledge creation predicated on the emergence of a novel phenomenon; this novelty, however, is mainly seen as stemming from dialectic differences and tensions, that is, dialectic relations between different types of knowledge held by different communities (Flick, 1998).

Similarly, in the wider social literature on knowledge creation and social interaction, a novel idea is widely assumed to be triggered by some form of challenge to our sense-making through dialectic influence relations with others or with what we experience. For instance, research on knowledge management and organisational learning (e.g. Brown & Duguid, 1991; Hoshmand & Polkinghorne, 1992) focuses in a similar fashion as social representations theory on explanations of knowledge creation through dialectic influence relations in social practice. Scholars argue that new knowledge creation is

rooted in and triggered by 'knowing' in interaction in organisational practice (Blackler, 1995; Varela, Thompson, & Rosch, 1991).

However, this is a view on knowledge as exclusively emergent from existent concepts or entities – notions that at the time they challenge our understanding of something are themselves already 'understood' and socially mediated notions. However, this ignores challenges or triggers from 'non-concepts', from phenomena that, at the time we experience them, do not make sense or we perhaps experience intuitively or 'merely' feel them but they nonetheless impact on our way of sense-making.

Why is this important? To be able to explain how novelty emerges, we need to be able to also account for those 'irrational' moments of disruption of our sense-making and reflection; those instances when current meaning is disrupted. This might be a feeling, a sudden sense experience or event that does not make sense in terms of a given social reference system of meaningful concepts. Generally, novel phenomena, are usually phenomena that we refer to as original, unheard-of or unexampled, as they do not have any meaning attributed to them (yet). When we experience them we refer to them as intuition, feelings, something that we know without being able to describe.

This is what RNA describes here as disruption: a disruption of our 'normal' everyday way of sense-making by something that does not make sense – that does not relate to any pre-existent concept. This is why RNA hones into rhizomic becoming as an important dynamic of innovation as this brings knowing closer to the dynamics in the material world, which we are crucially part of as biological beings. In this way we acknowledge that knowledge creation is not exclusively a dynamic taking place in the disembodied minds of individuals or in a separate ontological⁸ sphere to embodied experience. Rather, it is assumed that new knowledge originates primarily in the intersection of the sphere of thought and interaction with the experienced bio-physical world.

RNA draws on Deleuze and Guattari's (1987b) argument for experience of the physical world and its spatio-temporal dynamics as the main site to explore conditions for creation (DeLanda, 1998). Deleuze and Guattari challenge the classic meta-physical assumption that thought and understanding rule over human perception in sense experience (Bogue, 1989; Bryant, 2000). The argument is that different human faculties such as thought (faculty of understanding) or sensibility (faculty of sense experience) are all essential in generating creation – creation through continuous disruption of each other. In this sense, our sense experience of the material, embodied world may in a similar way determine what we come to construct or make sense of a particular phenomenon, not merely our (disembodied) thought about a phenomenon.

Specifically, for RNA this means that the force of creation and movement in the physical realm needs to be recognised in a particular effect on social construction: this is the effect of de-familiarisation. De-familiarisation occurs when a dominant way of sense-making in a community is disrupted by events. Events, in a Deleuzo-Guattarian sense, are a potential site of the conception of ideas (Deleuze, 1968). And crucially, the Deleuzo-Guattarian notion of events does not refer to the human reflection of experience in sense-making, rather a condition of possibility, the 'inventive potential' (Massumi, 1992, p. 140) of creation that comes with a spatio-temporal dynamic such as physical pressure, tension, differences in intensity.

Looking at networks in such a way, shifts the analytical focus from an exclusive focus on networks as an aggregation of connections between pre-existent human knowledge-nodes in the social world to networks as an intensity of processes of becoming that potentially impact on our sense experience and impact on the way we make sense. We avoid thinking about novelty as being conceived first in the mind, and then later implemented in the experiential realm of action in terms of an 'outside' environment. Rather, forces in the 'environment' become part and parcel of knowledge dynamics in that it potentially affects and disrupts sense-making.

Analysing networks with RNA, then, means (i) conceiving of them as rhizomes, as phenomena of processes of becoming rather than exclusively networks of influence relations between knowledge nodes and (ii) exploring the extent to which novel assemblages disrupt social construction; in other words, the extent to which a social network is not only a context of meaning familiarisation but also one of meaning disruption.

Before we move to the second step of RNA, table 2 provides a summary of social constructionist and rhizomic dynamics as well as of their effect on knowledge.

	Social constructionist dynamics	Rhizomic dynamics
<i>Condition</i>	Evolution of shared meanings (themata) of concepts	Rhizomic movement, discontinuous, multiple, divergent flow of events
<i>Knowledge creation</i>	Shared social references and meanings evolving from communicative interaction	New connections arising from crossings and disruptions of different rhizomic patterns
<i>Effect on knowledge</i>	Collective adjustment of knowledge (familiarisation)	Experience disrupting and inspiring knowledge construction (de-familiarisation)

Table 2: Summary of social constructionist and rhizomic dynamics and their effect on knowledge

STEP 2 - Three types of encounters

As for the second analytical step, RNA looks at the extent to which both conditions of the creation of new concepts, social constructionist and rhizomic dynamics, encounter each other. This is for the reason that social construction without disruptions would mean that there is little amount of change in a social context and vice versa, a high degree of rhizomic dynamics without any presence of social construction would mean that even though there is a lot of movement and creation, there is no human reference system that this movement and creation can cut into; hence, novelty would not even enter the social realm of sense-making. Figure 1 illustrates the three types of encounters that RNA concentrates on, mapping continua of social constructionist and rhizomic dynamics onto each other.

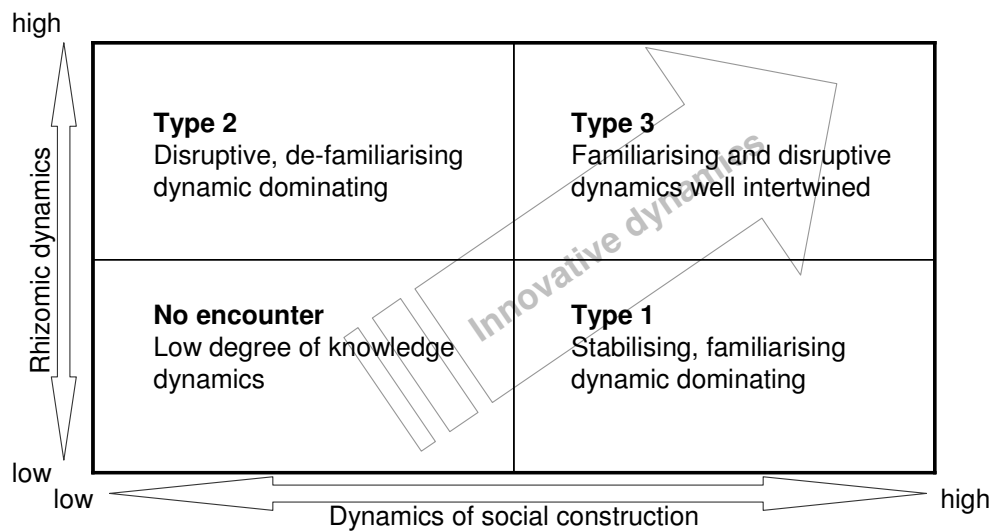


Figure 1: Knowledge dynamics: types of encounters

To diagnose innovative knowledge dynamics, then, RNA focuses on the following three forms of encounters.

Type 1 encounter

This type of encounter describes a social context in which dynamics of social knowledge construction dominate social sense-making. This means people's sense-making is revolving around central and socially objectified themata that are rarely challenged. Rather, people frequently re-iterate them in discourse and if there is a novel theme presented, people would react with a lot of resistance. This would also mean that overall the dominating dynamic is a familiarising and stabilising effect of certain themata in sense-making; people would feel a strong sense of belonging to a certain way of sense-making; hence, a strong and highly familiarised social reference system. By contrast, disruptions of such a social reference system would be rare, novelty would usually be rejected or ignored. A highly institutionalised organisation is an example of such a knowledge dynamic; it is usually social systems with a strong sense of coherence and ordering, highly static in a sense that meanings and events are often pre-categorised and anticipated. Under such conditions, it is unlikely that novelty is going to surface other than in what might be a temporary disruption (perceived negatively) of meaning of a strongly socially accepted and shared concept.

Type 2 encounter

This type of encounter describes a context in which de-familiarising dynamics dominate. This means that people do not share a sense of belonging to a social reference system, the degree to which themes are shared and continuously re-negotiated is low. Rather, what we would find is a variety of disjointed and dispersed meaning elements that are not integrated or related to any pattern of socially shared and anchored meaning. For instance, we can think of an agglomeration of individuals or groups that are inspired by many new ideas and are very open to change and novelty, yet, who share no reference system to bring these new ideas into relation to. This type of dynamic would usually result in a highly unstable social system, de-centred and multi-faceted but with

no social coherence or stability. In a similar vein as in the Type 1 encounter, in such a scenario it is unlikely that novelty is going to evolve socially into shared concepts.

Type 3 encounter

RNA holds that Type 3 encounters point towards a social context in which new concepts (and thus innovation) are likely to emerge. A Type 3 encounter describes a context in which social constructionist and rhizomic dynamics are well intertwined and continuously disrupting each other. This means that there are central shared meanings that are continuously re-negotiated and represented in a community, but they are flexible in that they are open to change and can adapt easily to novelty and challenge. This means that new routes and connections of meaning are possible and frequent, and usually communities would be in the process of substantially reconstructing the meanings of some of their shared, central concepts.

A Type 3 encounter is like a wavering dynamic between the experience of radical difference and the constraints of existent, socially dominant meanings. Together, this creates a discontinuous rhythm of opening up and closing down, which produces a spiralling dynamic of disruption and adaptation of meanings, an alternation between increasing complexity and inspiration by sense experience and the constitution of concepts. This movement, in its new combinations and crossings, allows novelty to be unleashed and while overall, it moves a meaning system forward, at the same time, it hinders it from becoming a chaos.

To illustrate how this diagnostic on knowledge dynamics can help the analysis of business networks we now consider the example of Ecademy (Steinberg, 2005).

The case of Ecademy

In 1998 two entrepreneurs in London's (UK) outskirts launched a social network for e-business entrepreneurs called Ecademy.com, which involved a Web-based networking service offering online introductions to entrepreneurs, as well as regular networking events in London. They expected initial membership of a dozen additional members per month; they achieved hundreds shortly after launch. Today, they have catapulted their network start-up into a global business network with more than 80,000 members worldwide. In fact, Ecademy has transformed into a growth engine that is driven not just by membership fees but also by consulting services to entrepreneurs.

Today the Ecademy business network extends into job marketing, training and consulting services and it continues to drive value and growth of its member entrepreneurial businesses. Given this success in terms of quantitative growth, what can be said about the qualitative reasons for its popularity and its continually growing membership base? Specifically, what can be said about its success in terms of knowledge creation and innovation?

These questions were amongst those asked in a study (Steinberg, 2005) that explored e-business entrepreneurship networks for their innovative dynamics. As for the research design used, a novel combination of methods of analysis was used to address the challenge of operationalising the notion of rhizomic dynamics; an area that has been virtually unexplored from a methodological angle. The methodological design of this

study is outlined in detail elsewhere (Steinberg, 2005); in what follows I briefly outline the main points.

1. RNA necessitates some form of thematic analysis of the content of people's discourse. This is important as the dynamics of social construction are mainly to be captured by tracing changes in themata in communicative interaction. In this study, this was realised by analysing the content of twenty-five semi-structured interviews and a focus group with e-business entrepreneurs.

2. RNA requires explorative sampling of respondents; a pre-defined population with socio-demographic boundaries would contradict the aim of better understanding networks in its character as social reference systems, which span across organisational or other community boundaries. The study adopted an approach of data corpus construction which is functionally identical to purposive sampling (Bauer & Aarts, 2000; Gillespie 2004; Gaskell and Bauer, 2000), yet samples contents, such as shared meanings and novel phenomena. There were minimal candidate criteria for potential respondents: (i) respondents had to be actively involved in creating a nascent small or medium-sized businesses since or since shortly before the dotcom crash; (ii) respondents' entrepreneurial business had to be in Internet-enabled business (Whinston et al., 2001; Small Business Service, 2004) and (iii) the location of the business had to be London⁹.

3. The focus on RNA on rhizomic dynamics demands a novel approach to data analysis, one which integrates Deleuzo-Guattarian ideas into social psychological analysis. While the importance of Deleuzo-Guattarian logic is claimed by many scholars, convincing empirical investigations of their ideas are rare. However, as Brown and Lunt (2002) have argued, Deleuzo-Guattarian ideas offer the possibility of a novel re-interpretation of classic procedures of research. They invite us to re-think the variety of methods that researchers have at their disposal in the context of a new understanding of a theory. What matters, they argue, is not the research instruments per se, but,

“the way we approach [research methods], the phenomena we choose to attend to ..., and the way in which we understand the relationship between the [research method] and the theoretical ...” (Brown & Lunt, 2002, p.20)

With this in mind, the study cited here proves an example of how the Deleuzo-Guattarian notion of disruptions and assemblages was operationalised by triangulating (Flick, 1992) the data from the interviews and the focus group with a Deleuzo-Guattarian interpretation of participant observation (Steinberg, 2005).

Participant observation was chosen as it was important to 'think becoming' along Deleuzo-Guattarian lines, allowing the researcher to escape 'the process of question and answer [which] is made to nourish dualisms' (Deleuze & Parnet, 1987, p. 19). This is important as we are interested in disruption, in events of de-familiarisation rather than the familiarising dynamic of social dialogue re-iterating central themata. Participant observation enabled to turn to a 'rhizomic mode of analysis' that leaves behind the 'grille' (Deleuze & Parnet, 1987, p. 19) of invested concepts – in this case, the invested dialectic concepts about networking. It offers the opportunity to concentrate on what was presented rather than re-represented (Deleuze, 1983) and thus to highlight particularly those phenomena in my experience of networking that did not 'make sense'

either in relation to the 'grille' of concepts in an a list of questions for an interview or focus group (researcher's expectations).

In parallel to the interviews and the focus group, I 'observed-as-participant' in entrepreneurs' firms when interviewing, in coffee houses, a business fair and at networking events. Networking events took place in restaurants, bars, a media club and a theatre. I participated in online networking as well as in eight face-to-face events. In experiencing what entrepreneurs experienced I concentrated on phenomena that were ambivalent to dialectic patterns from either my own expectations (such as in the interview topic guide) or from interview discourse. I focused on startling phenomena I experienced, events which did not translate into any pre-existent concepts (in my own or respondents' discourse) and new connections that would seem counter-intuitive to be working together (according to pre-existent concepts) yet, nonetheless, worked extremely well together.

Ecademy: a new concept of trusted business networking

The case of Ecademy was an example of a network where there were several indicators for Type 3 encounters in knowledge dynamics. At first sight, Ecademy's success seemed to be due to the fact that first, it grew considerably in terms of membership numbers and second, successfully launched new services that could be offered to the network members. One could conclude from this that the success of this network was mainly a case of revenue through consulting services. This would, however, leave unexplained as to why it became so popular and why it grew so rapidly in terms of membership numbers.

The analysis with RNA showed that the success of Ecademy was not exclusively a case of sales of consulting services, but also an innovative new form of business network that enabled trusted business relationships. Specifically, RNA surfaced an emergent knowledge dynamic that showed how a dominant shared theme about trust was becoming disrupted by a novel emergent process of generating trust via online networking. This contributed, at the time of the study, considerable value in fostering a thriving business community.

The new concept of trust in Ecademy unfolded in encounters between (i) the dynamics of social construction of a new social reference system around the community of e-business entrepreneurs, mediated by the historical challenge of being publicly associated with a negative image of dotcom entrepreneurship and (ii) rhizomic dynamics emergent from new combinations between affect and technology in online networking, which became significant in the everyday experience of networking.

As for the social constructionist dynamics, the thematic analysis of the data from semi-structured interviews and the focus group yielded a meaning system that showed that the main meaning at stake was the question of a sense of identity of the modern, post dotcom crash business community of e-business entrepreneurs. An adaptive dynamic of social representation was found that served respondents to familiarise modern elements of e-business with traditional aspects of entrepreneurial business. Three central themata structured entrepreneurs' discourse as evaluative dimensions when sense-making of their business community: (i) collective versus individual, (ii) long-term versus short-term and (iii) modern versus traditional.

The question as to whether e-business entrepreneurship was associated with the dotcom boom was the main challenge for entrepreneurs and in response, a new social representation of e-business entrepreneurship as collective, strategic and long-term business approach had emerged that contrasted dotcom business approaches.

Entrepreneurs were in the process of creating a new sense of identity as a business community by debating the extent to which e-business entrepreneurship has evolved as a modern and new business sector which is different to dotcom entrepreneurship. There was a strong concern for collective-ness as well as for generating strategic, long-term client value. At the same time, entrepreneurs were keen to emphasise that they valued traditional business rules. Together this created a new social reference system, via which respondents evaluated e-business entrepreneurship positively as a new era of business against the notion of 'dotcom entrepreneurship' that was attributed negatively.

As a subset of these central themata found, the theme of 'trust versus distrust' played a prominent role. It served entrepreneurs to oppose the negative dotcom image: respondents constructed a morally 'better' version of networking by contrasting them to the 'arrogant' and self-interested style of informal networking in the dotcom era. Mainly, the debate framed by the trust-distrust theme can be grouped into two themes: 'informal networking events' and 'online networking'. Face-to-face networking was strongly contrasted to online networking as well as to networking events in the pre-dotcom crash era and more traditional face-to-face events in the realm of business referral networking. Informal networking events were represented as more trustworthy than online networking as they were face-to-face.

As for the rhizomic dynamics, the experience of networking via Ecademy had begun to disrupt the dominant way of sense-making of online networking as distrustful. This was mainly due to the fact that trust had begun to emerge from new assemblages¹⁰ of friendship and online networking technologies. Lines of affect and lines of technology¹¹ crossed each other in new ways, which individuated in a new force that empowered online networking to be trusted. The main phenomenon in which this new assemblage individuated¹² and disrupted sense-making was in the online visibility of one's contacts via the personal profile page.

The personal profile page was at the centre of this dynamic. It was in and around the personal profile pages of members of Ecademy that a buzzing universe of interaction amongst entrepreneurs was found; it was here that the creation of a new social reference system of e-business entrepreneurship took place. The personal profile page was a personal Web-space that Ecademy members were assigned to upon registration. Via one's personal profile page one could publish all types of information about oneself and one's business. Essentially, the personal profile page allowed members to create a profile of oneself and then seek out for connections with 'friends' and 'friends of friends' online.

The tool of the personal profile page opened up one's personal network to an unlimited array of contacts. Once registered with Ecademy, one was immediately connected to the online universe of personal profile pages and could browse the pages of other entrepreneurs in related business fields or sub-networks. Members could communicate with each other either by leaving a message in their guestbook, or through a 'private message' system. One could also directly contact 'friends of friends'. Equally, one's own

page could be accessed by all other members of a network; it was also searchable via a search tool.

However, the sheer limitless potential of expansion of one's personal network was variously disrupted by several tools that make one's contacts publicly visible. A central one was the list of friends. It was a tool featured on each personal profile page, embedded into an automatic process of the online system that tracked one's online interactions. More precisely, the list of friends was a dedicated space on the personal profile page that was automatically generated: whenever two network members requested and confirmed their contact online, it added the names of one's contact to a list on both personal profile pages.

A common way of interacting, therefore, was to contact other entrepreneurs by browsing their personal profile pages, and subsequently sending a guestbook note or personal message. Once a first contact was established, the online system automatically offered the option to 'request or confirm friendship' with new contacts. Such confirmation would then result in the name of the contact being displayed on the list of friends, generating a link to that contact's personal profile page from one's own page.

Contacts that network members made in this way were called 'friends'. There were a variety of 'contact management tools' such as private messaging, guestbook features, special interest sub-groups, Weblogs and message boards – all of which could be used to generate new contacts.

This way of interacting online let friendship become an online tool for entrepreneurs: a technology of making business contacts that integrated the personal profile page into the daily socialising apparatus of entrepreneurs. The ways in which lines of technology and lines of affect became enmeshed in Ecademy created new conditions for rearrangements in trust that would otherwise depend primarily on face-to-face interaction. Online interaction became a viable medium to establish trusted relationships amongst entrepreneurs.

Gathering contacts via tools such as the list of friends on Ecademy became a major business activity that was deemed as contributing to entrepreneurs' trustworthiness and credibility for future business. The more a network member could 'prove' via the quantity and quality of 'friends' on the list of friends and via the amount of guest-book sign-ins that s/he 'had' friends, the more this person was deemed trustable and successful. The technology of visualisation of one's contacts thus also became an affect-becoming of technology in that the visualisation of one's network of friends was the central 'organ' of the network – a large and 'busy' list of friends online emerged as a quality criterion for trustworthiness as a business.

What emerged was that networking online became part of the entrepreneurs' technology to establish reputation and to be considered a trustworthy business partner. A mechanism of 'vetting each other online' arose that functioned much like a quality filter for establishing trust to other potential contacts. The technology of the network became part of one's 'real' personal reputation.

This new sense of establishing trusted business connections online variously disrupted the dominant themata of online networking as anonymous and distrustful. The

experience of networking provided by Ecademy opened this milieu up to create a new sense of e-business entrepreneurship ready to compete against other types of business, not merely against its own history.

This is what made Ecademy innovative: a new dynamic had emerged that empowered entrepreneurs to understand and tackle e-business entrepreneurship in novel ways as a community. A new concept of business networking was shaping that worked for entrepreneurs without being rooted in concepts of trust via proximity or shared history. It was an emergent new concept of trusted business networking that created change in sense-making: new potentialities emerged for discourse to be 'freed up' from the dominant theme of the shared history of the dotcom boom and the notion of online interaction as distrustful.

But Ecademy had gone one step further. It not only scrutinised the absence of a basis for trust in digitised interaction, but it also connected it in new ways with face-to-face networking. As part of the new concept of trusted business networking, there was a new emergent discourse of 'network management': at the time of the study, a new debate of effective network management had begun to emerge amongst some of the Ecademy members. Network management had begun to be discussed as a new factor in generating competitive advantage for e-business entrepreneurship against larger multi-national businesses.

Network management was a notion that built strongly on the concept of trusted business networking and structured networking activities around it. It was, for instance, manifested in that Ecademy had begun to frequently host face-to-face networking events that initially took place in London either biweekly or monthly, at different venues, but also increasingly nation-wide and internationally. These face-to-face meetings were closely intertwined with the trusted online networking via the list of friends. They functioned like an extension of the list of friends that intensified this new form of networking; they extended the list of friends into entrepreneurs' private life as well as their everyday life 'outside' the online network - the friendship-technology 'became entangled' with the 'real' everyday life of entrepreneurs.

Overall, therefore, the intersection of the dominant dialectic meaning-system with the new concept of trusted business networking had the effect of (i) discontinuing the salience of representations of trusted networking in e-business entrepreneurship as mainly determined by face-to-face contacts, and of (ii) generating a starting point for a new perspective on networking as a type of managed business based on trusted online networking. Together, this enabled e-business entrepreneurs to break away from their shared past and move into a new direction of competitive and innovative network management based on a new sense of what it meant to be part of the e-entrepreneurial business community.

FUTURE TRENDS

What Ecademy had tackled was the inability of traditional business networks to manage the quantity of contacts and connectivity beyond a certain threshold of size and complexity, but crucially, by, at the same time, addressing issues of anonymity and the risk of false identities in online communication. This supports scholars (e.g. Lash, 2000; Rheingold, 1994; Tucker & Jones, 2000) who argue that there is a new form of trust

emergent not only in online interaction, but also generally as a social phenomenon: a new type of network sociality (Wittel, 2001), that, at its very centre, features an emotional attachment to an apparently bodiless and physically disparate way of engaging with others via computer-mediated social community (Rheingold, 1994).

In Ecademy, business interaction in the real and virtual worlds have become combined in such a way that it allows entrepreneurs to establish flexible and ephemeral conditions for new business contacts and future partnerships independently of face-to-face contact. Thus, via this type of network, people, places and ideas could be linked into new combinations, generating a new sense of what Castells (1996) called 'real virtuality'. It was the distinct way in which Ecademy emerged as a community held together in real virtuality that was innovative and empowering: friendship and trust acquired a new technological character at the same time as technologies such as the list of friends became gradually part of the 'real world' of social interaction of entrepreneurs.

Ecademy's success in terms of its new concept of trusted business networking provides an example that is promising in terms of UK policy for entrepreneurial business support. Since the dotcom crash, there is a growing number of initiatives in UK policy on small business and entrepreneurship¹³ to enhance entrepreneurs' capabilities and skills (Gibb, 1993) Amongst these are efforts through educational establishments and governmental institutions, such as support agencies (Byers, 2000; DTI, 2000), to equip individual businesses and entrepreneurs with appropriate skills for Internet-enabled business (Small Business Service, 2004).

The case of Ecademy presents an example of what type of business support and community entrepreneurs might be seeking. Specifically, given that there is increasingly evidence that policy measures such as the above address entrepreneurs' needs only to a small extent (e.g. Harding, 2002; Harding, 2003), the new concept of trusted business networking as illustrated by the case of Ecademy, suggests an approach to entrepreneurship policy and intervention that focuses to a greater extent on establishing trusted business networks rather than concentrating exclusively educational measures for individuals.

CONCLUSION

The purpose of this chapter has been to introduce RNA as an approach to diagnose business networks in terms of their knowledge dynamics of innovation. The main benefits for analysis are (i) that RNA shifts the focus of analysis from structural and relational characteristics of social networks to emergent dynamics of meaning change in relation to meaning disruption, and (ii) that thereby RNA allows analysis to assess qualitatively whether there are conditions emergent that would favour the creation of new concepts. This overcomes some of the issues identified with implicit assumptions about the nature of knowledge in conventional approaches to analyse knowledge creation and innovation.

To explore these new diagnostic opportunities further, however, further research is necessary to develop our methodological repertoire to operationalise Deleuzo-Guattarian thought on rhizomic dynamics. As we have seen in this chapter, RNA was operationalised by means of thematic analysis of discourse and a new approach to data

analysis informed by Deleuzo-Guattarian philosophy of 'thinking rhizome'. While this proved an invaluable first step, nonetheless, specifically the notion of disruption needs to be tackled in a more fundamental conceptual way in terms of sense experience. While with the current approach sense experience of networking could be described as 'affecting' new assemblages and disrupting sense-making of networking, it would be of great benefit to be able to apply a conceptual construct of affect dynamics (based on Deleuzian logic) to guide the analysis.

A promising inroad here is the study of affect and intuition as biopsychological phenomena. Drawing from neuropsychology and cognitive psychology, it is well established in biopsychosocial studies that individual novelty-seeking behaviour can only be examined and understood in relation to the neuro-physical states (emotion, movement, sense and biological rhythms) we are in (e.g. Amabile, 1996, Amabile et al., 2005; Simonton, 1981). For instance, researchers in this arena look at how real-world complications such as personal interruptions, stress, power conflicts, scheduling constraints, private agendas and so forth impact on our sense-making. These are generally ignored in research, even though they impact on a daily basis on the course of our activities and sense-making.

However, the challenge that remains is to find ways in which conceptions such as affect can be moved onto a meta-theoretical platform that recognises rhizomic becoming as patterns of dynamics. Rather than assuming dialogic influence relations between neuro-physical states and sense-making, theorising needs to become more realist taking into consideration dynamic patterns of creation in the material world in their own right. It is time to open a new chapter in the study of knowledge dynamics: that of the interrelation between embodied sense experience and social sense-making – yet, not in an essentialist or dialectic sense - in a rhizomic sense.

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Definition of key terms

Knowledge dynamics is defined in this chapter as the movement emerging from the cross-fertilisation of the social dynamics of communicative interaction with the continuous dynamics of creation in the material world. This causes all sorts of disruptions and discontinuous flows that, in our everyday experience, play an important role in the way in which we come to make sense of novelty.

Social networks operate on many levels, from families up to the level of nations, and play a critical role in determining the way problems are solved, organisations are run, and the degree to which individuals or communities succeed in achieving their goals. In this chapter, social networks are defined here as the social communities and reference systems that emerge from the flexible connectivity of individuals or organisations through various forms of technology, enabling them to construct and create new knowledge together.

Innovation is defined here a particular type of social knowledge dynamics; it is one which revolves around the emergence of entirely new, socially shared concepts – new meanings, ways of interacting and experiencing – that, at the time they emerge, do not have a place in a given social reference system of meaningful concepts. They are usually phenomena that we refer to as original, unheard-of or unexampled as they do not relate to our existing repertoire of concepts. The construction of these new concepts happens in a dynamic process of de-familiarisation of existing meaning (through some sort of disruption that we experience) and, in turn, through the familiarisation of novelty (see also knowledge dynamics and RNA).

Social constructionism is a sociological theory of knowledge developed by Peter L. Berger and Thomas Luckmann (1966). The main social constructionist theory cited in this chapter, Moscovici's (1961/1976, 1984) theory of social representations, developed this theory further for social psychology.

The focus of social constructionism is to uncover the ways in which individuals and groups participate in the creation of their perceived reality. It involves looking at the ways social phenomena are created, institutionalised, and made into tradition by humans. Socially constructed reality is seen as an ongoing, dynamic process; reality is re-produced by people acting on their interpretations and their knowledge of it. Social constructionists argue that all knowledge, including the most basic, taken-for-granted common sense knowledge of everyday reality, is derived from and maintained by social interactions. When people interact, they do so with the understanding that their respective perceptions of reality are related, and as they act upon this understanding their common knowledge of reality becomes reinforced. Since this common sense knowledge is negotiated by people, human typifications, significations and institutions come to be presented as part of an objective reality. It is in this sense that it can be said that reality is socially constructed.

Social Representation Theory is a body of theory within Social Psychology originally coined by Serge Moscovici (1961/76, 1984). It is inter-related with both Discourse Analysis and Discursive Psychology. Social representation theory is popular among European social psychologists, especially those on the continent.

The theory of social representations was developed by Serge Moscovici in the 1960s as

part of a broader intellectual goal for a social psychology of knowledge. Social representations theory aimed to serve as a conceptual interface between psychology and sociology (Deaux & Philogène, 2001) in the explanation of how knowledge dynamics play a role in processes of social change (Moscovici & Marková, 2000). Starting from the Hegelian principle of dialectics, Moscovici opposed the Cartesian notion of knowledge as 'located' either within the individual or the social, critically emphasising that knowledge is not statically located in either the individual or the social but is rather continually brought forth in the constructive force of communicative interaction (Farr, 1996). It is difficult to provide a singular definition of social representations as many see the actual phenomena as too elaborate to capture its entirety (Marková, 2000) and the history of the concept too rich to be easily compressed into a single definition (Moscovici, 1988). Others see this as a precondition for further development and elaboration (Valsiner, 1998; Wagner, 1994). However, in relation to the particular phenomenon of knowledge dynamics discussed in this chapter, it can be said that Moscovici's conceptualisation of social knowledge offers a perspective of how new knowledge arises from social construction, embedded in a dialectic meta-theory. Social construction is seen as an inter-subjective process driven by the creative force of the tension between the unfamiliar and the familiar.

Hegelian dialectics. In classical philosophy, dialectic refers to an exchange of propositions (theses) and counter-propositions (antitheses) resulting in a synthesis of the opposing assertions, or at least a qualitative transformation in the direction of the dialogue. Over the years, it has been refined and interpreted in various ways, ranging from mathematical algorithms to political manifestos such as in Marxism. In social representations theory, it is particularly Hegel's dialectic method which informed theorising (Marková, 2003). Specifically, Moscovici used the Hegelian dialectic to develop a dynamic and inter-subjective notion of shared representation for social psychology (Marková, 2003). Moscovici's main theoretical achievement in establishing this was to overcome the Cartesian subject-object dichotomy by demonstrating how knowledge evolves from an inter-subjective meaning construction process. It was here where his theorising was particularly inspired by the Hegelian dialectic model of movement (Hegel, 1807, 1830). In social representations theory, Hegel's (1830) dialectic model is mainly featured as a triadic dynamic that continually evolves in 'being', in essences, concepts and identities (Colebrook, 2002) and that passes on through the difference between such beings. This is the notion that one begins with a clearly delineated concept (thesis), then moves to its opposite (antithesis), which represents any contradictions derived from a consideration of the defined thesis. Thesis and antithesis are contrasted and synthesised to form a new thesis (Marková, 2003).

Post-structuralism is a broad historical description of intellectual developments in continental philosophy and critical theory originating in France in the 1960s. The prefix "post" refers to the fact that many contributors such as Jacques Derrida, Michel Foucault, Gilles Deleuze and Félix Guattari (the latter two are cited in this chapter) were highly critical of structuralism. In direct contrast to structuralism's claims of culturally independent meaning, post-structuralists typically view culture as integral to meaning. Post-structuralism is difficult to define or to sum up. There are two main reasons for this. Firstly, by its very nature, poststructuralism rejects definitions that claim to have discovered 'truths' or facts about the world. Secondly, very few people have willingly taken the label 'post-structuralist'. Rather, they have been labeled so by others. This means that no-one has ever felt compelled to construct a 'manifesto' of

poststructuralism. Thus its exact nature and whether it can be considered a single philosophical movement is debated.

Gilles Deleuze and Félix Guattari are known as classic writers in the development of critical theory in the late twentieth century. **Gilles Deleuze** (January 18, 1925 – November 4, 1995) was a French philosopher of the late 20th century. From the early 1960s until his death, Deleuze wrote many influential works on philosophy, literature, film, and fine art. His most popular books were the two volumes of *Capitalism and Schizophrenia: Anti-Oedipus* (1987a) and *A Thousand Plateaus* (1987b), both co-written with Félix Guattari. **Pierre-Félix Guattari** (April 30, 1930 – August 29, 1992) was a French pioneer of institutional psychotherapy, as well as the founder of both Schizoanalysis and Ecosophy.

Critics often loosely describe the Deleuzo-Guattarian approach to philosophy as 'artistic' and indeed, at a first glance, the work of Deleuze and Guattari may appear rather complex and 'different'. Their writings teem with new terminology such as lines of flight, assemblage, intensity, rhizome, becoming, machinism to name but a few. However, a thorough reading of *Difference and Repetition* (Deleuze, 1968) and *A Thousand Plateaus* (Deleuze & Guattari, 1987b) unveils a rather different picture: what we find is a carefully crafted philosophy that is fundamentally concerned with the dynamics of emergence. Deleuze and Guattari's work is a paradigm of thinking about the social dynamics of innovation. It is a logic that is fundamentally concerned with dynamics of experience aiming to discover conditions under which new concepts (Deleuze, 1995, p. 103) might be produced. Deleuze and Guattari fundamentally reject Hegelian dialectics as a dynamic that generates movement.

Entrepreneurial business networks are social organisations offering different types of resources to entrepreneurs to start or improve entrepreneurial projects. The goal of most entrepreneurial networks is to bring together a broad selection of professionals and resources that compliment each other's endeavours. Initially a key priority is to aid successful business launches. Subsequently provide motivation, direction and increase access to opportunities and other skill sets. Promotion of each members talents and services both within the network and out in the broader market increases opportunities for all participants.

Rhizomic Network Analysis (RNA) is an approach of analysing and diagnosing social networks for their type of knowledge dynamics of innovation. The method is based both post-structuralist and social constructionist assumptions of creation and emergence. By combining theories by Deleuze & Guattari on the analogy of the rhizome to better understand the logic of discontinuity and disruption of movement and creation with social representations theory in terms of its dialectic logic of social knowledge construction, it takes a novel analytical view on knowledge dynamics. It offers a new paradigm of understanding the potential of new un-precedented connections, of disruptions and of experience in the emergence of novel concepts. This counters research shaped by a logic of thought that attributes innovation causally to individuals or to the diffusion or transfer of knowledge units between different, artificially separated spheres. This is important, as economic theories based on this view of knowledge often devise educational measures focused on individuals' knowledge or measures that reinforce the bridging of theory and practice, cognition and interaction. RNA argues, by contrast, that if we are to better understand innovation, we need to look at knowledge

creation in social construction and shared experience in communities, in its interplay with disruption by dynamics in the physical world.

Endnotes

¹ Worldwide stockmarket collapse of high-tech firms' values. In the UK alone, hundreds of dotcom firms experienced bankruptcy. The dotcom crash not only meant a major change for the whole sector of e-business entrepreneurship, but it also created a 'start-from-scratch' scenario for many entrepreneurs and raised new questions as to how knowledge management in entrepreneurial business can be approached.

² Theories have been forwarded, for instance, that explain the economic effectiveness of the creation of new ideas as a function of specific entrepreneurial motivational states (e.g. Swayne & Tucker (1973), Moore's (1986)).

³ Anchoring means classifying and naming something new or strange. Moscovici (1984) writes people strive 'to anchor strange ideas, to reduce them to ordinary categories and images, to set them in a familiar context' (p.29). Objectification describes the process of when something anchored leaves the world of the abstract and takes shape in artefacts or physical practices. Objectification, like anchoring, serves to familiarise the unfamiliar.

⁴ As Marková (2000) emphasized, themata are the meaning currency that gives communication and interaction their sense in a social group. They take the form of dyadic oppositions or contrasts, such as 'Generic/specific', 'individualism/sociality' or 'simplicity/complexity' (Holton, 1978).

⁵ Becoming is a Deleuzian term with which Deleuze took up Nietzsche's idea that being is becoming: there is an internal self-differing within the different itself, the different differs from itself in each case. Everything that exists only becomes and never is.

⁶ A Thousand Plateaus is itself designed as a rhizome; it is written as a stream of events, alliances, connections (rather than a discussion of concepts), refusing to follow a single chain of signification. Their writing is a rhizomic becoming itself as it ceaselessly achieves multiplicity by establishing unusual connections.

⁷ Deleuze and Guattari draw on Bergson's (1911/1983) notion of creative evolution, specifically on Bergson's point that 'real' movement always involves a living interpenetration rather than a derived relationship between discrete points or positions in space. What Deleuze and Guattari envision is a pattern of dynamics as the multiplication of connections in a rhizomic system, which cannot be reduced to any sort of fixed pattern or constellation of unities. For them, this is a condition under which new concepts might be produced. This creates a perspective on networks as phenomena of discontinuous movement, multiplicity and disruption, underscoring the importance of unpredictable and divergent patterns of combination.

⁸ Ontology is a word that is used in many different ways. It is often considered to be identical with metaphysics, or as the branch of metaphysics dealing with the nature of being or reality. Here it is used in a more literal sense reflecting its Greek word-stem 'ontos' (to be) as the science of how a thing (object or concept) comes into being.

⁹ London was selected as the context to conduct the exploration due to the fact that it is probably the most vibrant setting of e-business entrepreneurship in the UK and thus was likely to provide a rich source of diversity in terms of e-entrepreneurial businesses from which to recruit respondents for the study.

¹⁰ Please note that in the account on Ecademy, Deleuzian terms such as 'becoming', 'lines' and 'assemblages' are used. This follows the Deleuzo-Guattarian approach to 'think rhizomic' writing an analysis pointed to the possibility of escaping from 'the process of question and answer [which] is made to nourish dualisms' (Deleuze & Parnet, 1987, p. 19). It enabled the analysis to turn to a rhizomic mode of analysis that would leave behind the 'grille' (Deleuze & Parnet, 1987, p. 19) of invested concepts – in this case, preconceived concepts about networking. Rather than merely reiterating these, it offered the opportunity to concentrate on what was presented rather than re-represented (Deleuze, 1983) and thus to highlight particularly novel phenomena from the study.

¹¹ Lines are Deleuzian terms referring to the fact that rhizomes are ambivalent to fixed points or the dyads in an oppositions - they make a rhizome what it is: de-rooted. A line can be an event, an affect, a nonsense, a percept, a something, a movement. Lines can connect to anything; yet can be broken at any instant, only to take off again in any direction. In comparison to dialectic lines of progression, lines do not function in terms of lines with a beginning and an end (Deleuze & Guattari, 1987b). In the analysis of this study, therefore, lines were thus about attempting not to look for origins or destinations, but to focus thinking and writing on what was 'in-between', that is, on those aspects that were ambivalent to existing evaluative dimensions, and second, on future-directedness of things instead of historical anchors.

¹² Individuation is a Deleuzian term which refers to a process of seamless and endless differentiation.

¹³ The UK has been investing a large amount of funds into enhancing entrepreneurial innovation since the late 1970s (Curran & Blackburn, 2000) due to its central importance for the UK economy. Small and medium-sized businesses accounted for over 99% of the UK's 3.8 million businesses at the start of 2002. In addition, since 1995 entrepreneurship is reported to have contributed to a steady increase in job creation and productivity growth in the UK (Harding, 2002, 2003). Today, the UK government spends around £2.5 billion a year on services targeted at small businesses (Small Business Service, 2004). The vision is to 'make the UK the best place in the world to start and grow a business' (Small Business Service, 2004, p.4).