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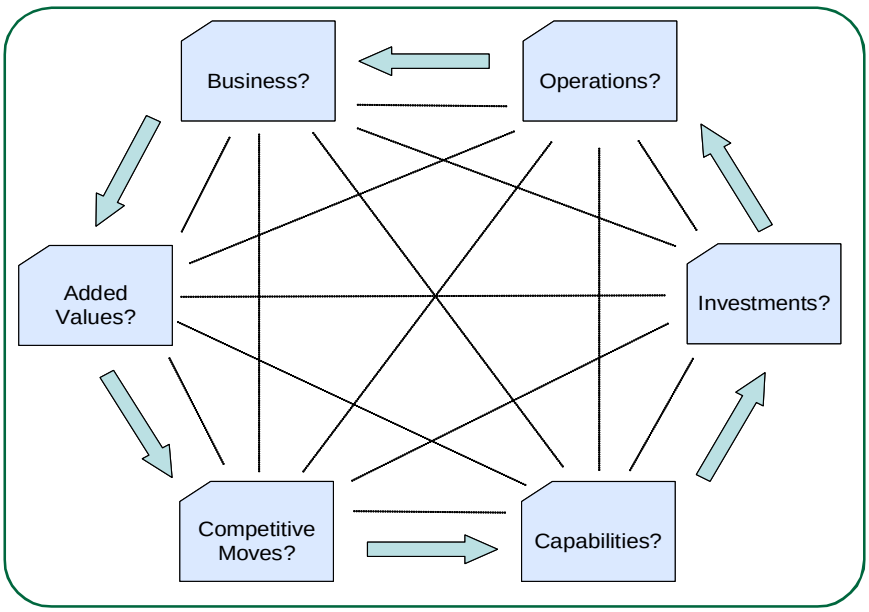

Tapio Koivisto

Developing strategic innovation capability of enterprises

Theoretical and methodological outlines of intervention

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Abstract

The research focuses on the question of the theoretical and methodological basis on which it is possible and sensible to approach and analyse the potentials and limitations of innovation and the development of the innovation capability – in the specific context of communities of practice and situated action and decision-making. What kind of basic theoretical assumptions, basic concepts and methodological solutions are possible and sensible as a starting point in analysing the potentials and limitations of innovation and the development of innovation capability in the specific context of practical activities and decision-making?

There is no ready-made, self-evident, integrating, systemic approach or theory to serve and direct the development of the innovation capability of enterprises. For this very reason, it was necessary to set, define and construct the subject, problem and context of research rather from the point of view of practice and cooperative inquiry – critically assessing, utilising and applying existing innovation research and the theory and strategic management concepts of the enterprise.

Innovation activities and development of the innovation capability of enterprises are not necessarily a priori a self-evident and inherently valuable goal. Underlying this notion is the finding that the consequences of an innovation activity and innovation may also be harmful or destructive. The development of the innovation capability of an enterprise – and innovation activity as a rule – is a contradictory, paradoxical and hence a discursive process. Schumpeter once discerned the paradox of innovation. He called the double dynamics of innovation as a process of “creative destruction”. Innovation means creation of new combinations of methods and machines and at the same time radical devaluation of produced values.

What, at any point of time, a social practice is depends on how human agents interpret it to be. And different interpretations constitute different realities. In other words, actors in enterprises and the management itself may have their own theories of the reform and innovation of products, services and processes. Representatives of enterprises also have their own views on the innovation capability of the enterprise, as well as the needs and challenges for its development – including the idea that no such development needs actually exist. The views of the active actors play a central and fundamental role as regards practical activities and decision-making.

Practical decision-making and activity are linked to a wider network and context consisting of many specialised actors and decision-makers. Practitioners and decision-makers are connected to a world, enterprise population and context of a certain sector that are distributed and multicentered in terms of the division of labour. Organisation is not a strategically isolated entity. It is one element in a broader population of organisations, each of which is using the others as a reference point for their own strategising and sense making activities.

The development of the innovation capability of an enterprise refers here to collaborative joint efforts and "productive inquiry and development" (Dewey) of the firm's innovation capability between researchers and the firm's representatives. Research and development work builds on the reflexive intervention methodology and heuristic principles. This leads us to the question of how the development of a firm's innovation capability can be perceived so that it makes sense. This, again, requires specific insight into "innovation capability", the "enterprise" as well as the mechanisms affecting the innovation capability of enterprises.

The key conclusion of the publication is that the self-referential, autopoietic and paradoxical nature of organisations, enterprises and practical operations in general must be taken seriously in research and development. The solutions proposed by Jan-Peter Vos are on that remarkably promising. The solutions and models developed by Jan-Peter Vos also offer an applicable and viable basis for the development of the strategic innovation capability of enterprises.

Foreword

This publication is the first theory- and methodology-oriented report on the project named Yritysten innovointikyvyn kehittäminen ja arviointi (Innovation Capability of SMEs in Progress – InnoPro). The project is being implemented by the industrial management group of VTT Products and Production. The project is part of the ProACT programme. ProACT is a joint research programme of the Ministry of Trade and Industry and the National Technology Agency (Tekes) into the interaction of technology, commerce and industry, and society.

The purpose of the InnoPro project is to develop a workable approach and method for developing the innovation capability of SMEs. A central issue here is the basis on which an enterprise- and future-oriented approach and method can be developed considering the fragmentation, historically retrospective nature and outsider view of existing innovation research. From the point of view of the actors in enterprises, on the other hand, it is essential to remain future-oriented and to bear in mind that an innovation process is often a contradictory and paradoxical process – "creative destruction". Moreover, from the perspective of the actors in enterprises, invention, innovation and diffusion of innovations cannot be approached as separate processes. They are rather recursively interconnected factors of innovation.

The publication is one phase of a research and development project of limited duration. However, the theoretical and methodological guidelines delineated in the publication are meant to serve as a basis of longer-term research and development.

In this connection I would like to thank especially the steering committee of the InnoPro project for their constructive and patient attitude toward this publication. The research and reporting work revealed in a very concrete way that the innovation of innovation is a process just as risky, contradictory and time-consuming as actual innovation. The project's steering committee has consisted of Pekka Pesonen of Tekes, Petri Honkanen of the Ministry of Trade and Industry, Tuomo Alasoini of the Ministry of Labour, Kari Peltonen of Talentum, and Mika Naumanen and Raimo Hyötyläinen of VTT. The project team has consisted of researchers Merja Airola and Kaisa Ilomäki, and research engineer Jyrki Poikkimäki. Thank you for the good cooperation!

Tampere, 3. November 2005

Contents

1. Introduction

According to many observers (see e.g. Lundvall & Borrás 1997), the changes currently taking place in the international economy increasingly emphasise the role of innovations and innovativeness in the operation of enterprises and regions. Globalisation, liberalisation of trade and the deregulation of markets as well as information technology revolution are changing rules of the competition game and putting innovativeness into the forefront that causes fundamental changes in the socio-economic system. The globalisation of production and markets enforces the tempo of innovation. Sustainable competitiveness of a country depends on the capacity of companies to learn and to innovate on a continuous basis (Schienstock 1999).

Innovation and innovativeness is a key to the economic vitality not only of individual firms but also groups of firms, localities and regions, nations and trading blocks of nations. Given the new competitive conditions in the global economy, innovation is a crucial factor in the ability of firms and countries both to adapt themselves to new constraints and take advantage of new opportunities. This question is crucial for Europe, which is confronted with the paradox of a strong R&D in many respects but a low level of innovation (Delmas 2002).

Prior research has identified a multiplicity of factors which potentially hamper or facilitate innovation. The factors hampering innovation include: manager's risk-averse attitude toward change (Delmas 2002), firm's poor ability to acquire knowledge/poor absorptive (Cohen & Levinthal 1990; Delmas 2002), difficulties in proportion to access to complementary assets, institutional rigidities (Delmas 2002), path dependency (Cohen & Levinthal 1990), technology trajectories (Nelson & Winter 1982), technological paradigms (Dosi 1988b), and lock-ins (David 1985).

Whereas the factors which potentially facilitate innovation include: creativity, imagination, attitude open to change, entrepreneurship (Schumpeter 1939; Drucker 1985), ability to exploit external knowledge (Cohen & Levinthal 1990), learning by doing and learning by using (Rosenberg 1982), learning by interacting (Lundvall 1992), networking and national systems and institutions that facilitates innovation (Freeman 1987).

Furthermore, in the resource-based view firm's capabilities are considered core if they differentiate a company strategically. Traditional core capabilities have a down side that inhibits innovation, called core rigidities (Leonard-Barton 1992). Managers thus face a paradox: how to take advantage of core capabilities without hampered by their dysfunctional flip side.

Besides obstacles mentioned before, prior research has identified some specific obstacles concerning the small and medium-sized enterprises (SMEs). Buratti and Penco (2001), for example, notes that the innovation capabilities of Italian SMEs, with particular reference to those firms operating in mature and fragmented sectors, are accompanied by many weaknesses in technological development. These involves poor ability of entrepreneurs to manage technology as a strategic weapon, limited human resources available for internal implementation or for management of adoption of new external technologies, and weak financial standing. All of these features may hinder the process of development and management of technological innovation.

Many SMEs seems fail to innovate in time, because they seem to be locked in a vicious circle: being fully occupied with solving short-term operational problems, management pays less attention to their long-term strategy and remains stuck in operational problem solving (Vos et al. 1998; Tidd et al. 1997, 70–71; Arnold & Thuriaux 1997).

Innovation can take many forms (Bessant 2003): from simple, incremental development of what is already there to radical development of totally new options. It can range from changes in what is offered – *product or service* – through the ways that offering is created and delivered. It can reflect the *positioning* of a particular offering. For example putting an established product into a new market can represent a powerful source of innovation. It can involve rethinking the underlying mental models (*paradigm*) associated with a particular product or service. The risk is that, even if firms recognise and accept the need for (continuous) innovation, they may find difficulties in framing an appropriate innovation agenda (product/service, process, position, paradigm). With limited resources they may find themselves putting scarce eggs into too few or the wrong baskets. The challenge is for firms to be aware of the extensive space within with innovation possibilities exist and to try and develop s strategic portfolio that covers this territory effectively, balancing risks and resources (Bessant 2003, 4–5).

Concerning the challenges and difficulties of the firms, however, one crucial problem remains: *how it is possible to recognise and identify the obstacles and opportunities of innovation at the right time and at the right place, in a context of situated learning and action* (Lave & Wenger 1991)?

Or, from the point of view of systematic research: *on which theoretical and methodological basis is it possible and sensible to analyse the potentials and limitations of innovation and the development of innovation capability when the context is that of communities of practice and situated action and decision-making?*

These problems also inherently contain the idea that the evolution/development of the innovation capability of an enterprise can be perceived as a process of transformation and change (see Lave & Wenger 1991, 48–49) or a process like learning by expanding (Engeström 1987). The idea of the development of innovation capability also comes relatively close to the view of Pettigrew and Whipp (1991) on the management of strategic change. This, again, is closely linked to the notion that the strategic views, ways of thinking (concepts, cognitions, mental models, intentions) and decisions of company management play a central role in the carrying out of strategic innovation and change processes.

Several authors have made the link between managerial capabilities and firm's growth or innovation. For example, Penrose (1959) suggests that firm growth needs managerial and entrepreneurial resources or services applied to create administrative systems and productive processes that exploit available opportunities. This suggests that managerial competences and abilities are paramount (Macpherson 2005). These competences and abilities obviously include the process of perceiving and assessing environmental change and its implications for the strategies, the technologies and the practices of the firm (Pettigrew et al. 1989).

As such, "learning to growth" (Macpherson 2005) and learning/unlearning to innovate is situated in the day-to-day activities in which managers engage, and in the specific relationships that circumscribe the management learning and decision-making. And at the heart of the process of strategic change and innovation are those dominating ideas and frames of thought which provide

systems of meaning and sense making which in turn filter both intra-organisational and environmental signals (see Pettigrew et al. 1989, 177). If management's general task is to assess changing economic, business and technological conditions and identify and implement new strategies which improve the firm's competitive performance, this implies that management's especial responsibility becomes the management of three related areas. This involves: (i) the management of the strategy content, (ii) the management of the process of change, and (iii) the contexts in which it occurs (Pettigrew et al. 1989, 121; Pettigrew 1985b).

Theorising in terms of practice also means a broad view of human agency (Lave & Wenger 1991), emphasising the relational interdependency of agent and world, activity, meaning, cognition, and knowing. A theory of social practice (ibid., 50–51) emphasises the inherently socially negotiated character of meaning and the interested, concerned character of the thought and action of persons-in-activity. This view also claims that learning, thinking, and knowing are relations among people in activity in, with, and arising from the socially and culturally structured world. This world is socially constituted, and knowledge is socially mediated and open ended. In a theory of practice, cognition and communication in, and with, the social world are situated in the historical development of ongoing activity.

2. Research tasks and goals

The tasks and goals of the research reported here has been to outline the theoretical and methodological guidelines for the development of the innovation capability of enterprises, primarily on the basis of existing innovation research and theories of strategic development of companies.

As already mentioned, the research focuses on the question of the theoretical and methodological basis on which it is possible and sensible to approach and analyse the potentials and limitations of innovation and the development of the innovation capability – in the specific context of communities of practice and *situated action and decision-making*. What kind of basic theoretical assumptions, basic concepts and methodological solutions are possible and sensible as a starting point in analysing the potentials and limitations of innovation and the development of innovation capability in the specific context of practical activities and decision-making?

The research is implicitly[1] based on four constructions that (implicitly) complement each other: (i) the contextual research approach, (ii) the constructive approach, (iii) the "strategy as practice" approach, and, by way of reference, to (iv) Niklas Luhmann's (1995) theory of social systems.

As Pettigrew (1985) notes, all research involves the application of skills, knowledge, and the person to a variety of problems in a variety of contexts. In that sense, it is a craft activity involving skills of individual judgement within a system of collective rules and communication.

So even while we are members of a community, we are also carriers of different root assumptions nurtured and reinforced in the different societal, academic, and political contexts where we practice our craft (ibid.). These *root assumptions*, when crystallised into the various academic subcultures, or paradigms, or rationalities, provide the systems of meaning that inform the kinds of individual

[1] The word "imply" has the same root as the word "implicate", and, as Bohm (1980, 204) argues, each moment of consciousness has a certain *explicit* content, which is foreground, and an *implicit* content, which is a corresponding background. In addition, not only is immediate experience best understood in terms of implicate order, but thought is basically to be comprehended in this order. This means that not just the *content* of thought for which we use the implicate order. Rather, this also means that the actual *structure*, *function* and *activity* of thought is in the implicate order.

judgements we make in the research process: what we choose to study, how we choose to study it, what literature we do or not read, how and with whom we develop relationships in research sites, what we are capable of seeing and making sense of, how we make connections between concepts and data, our capacities for intuition, insight, persistence, craftiness, and courage in getting into and out of research situations, and the extend to which our research is useful for theoretical development and practice.

Pettigrew (ibid.) has suggested that the *contextualist research* offers an opportunity to conduct research that is useful for theoretical development and practice. The central features of contextualist approach are (ibid.): the mutual nature of inquiry, the balance between involvement and distance, the notion that knowledge is created through a process of making, the importance of the situational and multifaceted character of meanings in research settings, and the holistic study of emergent processes in particular and changing contexts.

Like Schön's (1983) practitioners, the contextualist does not begin with the unilateral interventionist stance dominated by values of objectivity, control, and distance under the assumption that scientific truth is out there to be discovered by a process of knowing (Pettigrew 1985b). Rather, the contextualist begins with a more mutual stance, attempts to steer a middle course between involvement and distance, and recognises the relative and multifaceted nature of truth among people involved in the research process. Concepts and meanings are thereby shared and traded in the research process. Insofar acceptable definitions of acts in context emerge, they are not so much discovered by a process of detached knowing as they are created by a process of making. Schön's notion of having reflective conversation with a situation parallels the contextualist's desire not to singularly impose his or her concept of meaning on the actors in the situation. In the contextualist research, either meanings are decided by the actors and are negotiated among the researchers, and the practiotioners, or it is clearly recognised that there are multiple perspectives in the research setting.

In addition, there is also other parallels between Schön's (ibid) reflective practitioner and the contextualist approach, especially the situational nature of inquiry (Pettigrew ibid.). Because practitioners face situations characterised by uncertainty, complexity, instability, uniqueness, and value conflict, practice has at least as much to do with *finding the problem* as with solving it.

"Increasingly we have become aware of the importance to actual practice of phenomena – complexity, uncertainty, instability, uniqueness, and value-conflict – which do not fit the model of Technical Rationality" (Schön 1983).

As Schön (ibid.) states, from the perspective of technical rationality, professional practice is a process of problem *solving*. Problems of choice or decision are solved through the selection, from available means, of the one best suited to established ends. But with this emphasis on problem solving, we ignore problem *setting*, the process by which we define the decision to be made, the ends to be achieved, the means which may be chosen. In real-world practice, problems do not present themselves to the practitioner as givens. They must be *constructed* from the materials of problematic situations which are puzzling, troubling, and uncertain. In order to convert a problematic situation to a problem, a practitioner must do a certain kind of work. He must make sense of uncertain situation that initially makes no sense.

Although problem setting is a necessary condition for technical problem solving, it is not itself a technical problem (Schön 1983). When we set the problem, we select what we will treat as the "things" of the situation. We set the boundaries of our attention to it, and we impose upon it a coherence which allows us to say what is wrong and in what directions the situation needs to be changed. Problem setting is a process in which, interactively, we *name* the things to which we will attend and *frame* the context in which we will attend to them.

When ends are fixed and clear, then the decision to act can present itself as an instrumental problem. But when ends are confused and conflicting, there is as yet no "problem" to solve (ibid.). A conflict of ends cannot be resolved by the use of techniques derived from applied research. It is rather through the non-technical process of framing the problematic situation that we may organise and clarify both the ends to be achieved and the possible means of achieving them.

Constructivist methodology

Over the last years, several strategy researchers have argued for the potential of constructivism as a methodology for strategy research. From the constructivist point of view, the theoretical position held by the researchers not only guides their basic position, but also determines what gets construed as a research problem, what theoretical procedures are used, and what constitutes observations

and evidence (Mir & Watson 2000). Constructivists challenge the notion that research is conducted by impartial, detached, value-neutral subjects, who seek to uncover clearly discernable objects or phenomena. Rather, they view researchers as craftsmen, who are part of a network that creates knowledge.

The epistemological assumptions of constructivism are nonpositivist (Mir & Watson ibid.). According to constructivists, rules and principles do not exist independently of our theorising about them. They suggest that it is our theory that drives all aspects of our empirical inquiry, including what counts as observation, what research designs and experiments will be acceptable, and what problems are worthy of attention.

Mir and Watson (2000) identify six fundamental assumptions that are shared by constructivists. These include following assumptions:

- Knowledge is theory-driven. A researcher always approaches a problem with a preconceived notion about the nature of the problem, and by implication, a set of possible solutions for it.
- The separation of the researcher (subject) and the phenomena under investigation (object) is not feasible.
- The separation between theory and practice is equally unfeasible. Theory and practice are fundamentally interlinked. According the constructivists, practice exists both before and after theory.
- Researchers are neither "objective" nor value-neutral. Theories are discursive and power-laden, and transmitted across space and time through discursive practices.
- Research occurs within a community of scholarship where mutually held assumptions are deployed to create conversations.
- Constructivism constitutes a methodology, which is distinct from method. A method is a tool or a technique that is used in the process of inquiry. In contrast, a methodology may be regarded as an intricate set of ontological and epistemological assumptions that a researcher brings to his or her work. Methodology represents the doctrine of systematic forms of thought, and in order to be clear researchers need to be explicit about their choice of methodology.

Strategy as practice

Most recently, the practice approach has entered the strategy literature, recommending that we focus upon strategists engaged in the real work on strategising (Jarzabkowski 2004). From the perspective of *strategy as practice*, the key question is: what does it take to an effective strategy practitioner? (Whittington 1996). The practice perspective on strategy focuses on strategists and strategising, rather than organisations and strategies.

Whittington (1996) maps four basic perspectives on strategy:

- Emerging in the 1960s, the "planning" approach focuses on tools and techniques to help managers make decisions about business direction. Key analytical aids include the portfolio matrices, industry structure analysis and the concept of core competence.
- From the 1970s onwards, "policy" researchers have developed a new focus, analysing the organisational pay-offs to pursuing different strategic directions. The classical policy option considered has been diversification strategy, but much work has been done on innovation, acquisitions, joint ventures and internationalisation.
- Since the 1980s, "process" researchers have been exploring how organisations come first to recognise the need for strategic change and then actually to achieve it. The best-known process studies are those of Pettigrew (1985) and Johnson (1987).
- The "practice" approach draws on many of the insights of the process school, but returns to the managerial level, concerned with how strategists "strategise".

		Levels	
		Organisations	Managers
Issue	Where	***Policy***	***Planning***
	How	***Process***	***Practice***

Figure 1. Four perspectives on strategy (Whittington 1996).

The thrust of the practice approach is to taken seriously the work and talk of practitioners themselves. In recent years social scientists have been scrutinising the practices of scientists, accountants and architects (see for example Schön 1983). Now it is the turn on strategists (Whittington 1996). Treating strategy as a practice implies a new direction in strategy thinking. Is shifts concern from the core competence of the corporation to the practical competence of the managers as strategist. Like the older planning tradition, it too is aimed at the managerial level but now the focus is broader than the simple analysis of strategic direction. The issue is how managers and consultants act and interact in the whole strategy-making sequence (Whittington ibid.).

The practice perspective is concerned with managerial activity, how managers "do strategy" (ibid.) and practice is concerned with the work of strategising. Getting things done involves the nitty-gritty, often tiresome and repetitive routines of strategy. Here craft skill is as important as technical facility. Essential knowledge is as much tacit as formal, local as general; and persistence and detail may win over brilliance and inspiration.

Strategy practice is not the same for everyone (ibid.). The effective practitioner needs to understand both the local routines and the different roles involved in strategy-making. The ways of doing strategy in each firm harden into distinct and regular patterns, so that knowing the "done thing" locally is essential to

being able to get things done. Often, therefore, practical competence requires a readiness to work within existing structures and routines, rather than knowledge of some textbook ideal.

First and second-order observation

Niklas Luhmann's (1995) theory of social systems regards complexity as the ultimate problem of social systems. The starting point of social system theory is the complexity brought forth by the self-referential distinction between system and environment. Respectively, Luhmann's functional method can be seen as a means to observe the way social system reduce this complexity ant to put their attempts into theoretical perspective (Vos 2003). For this, Luhmann uses the distinction between first and second-order observation.

With first-order empirical observations, the aim is to observe how social systems observe. Respectively, with second-order empirical observations, the aim is to observe what social systems cannot observe because the way they observe (Vos 2002). For second-order observation the researcher needs an observational framework that is more comprehensive or complex than the framework in use by the observed social system. The ultimate goal of functional analysis is to compare functional equivalents on their dysfunctionalities or risks. Function is considered as a regulative heuristic scheme to compare the ways social problems are solved and to observe the unintended consequences of these functional equivalents.

The second order observation qualifies, justifies and improves knowledge. The second order observation refers to a process of reflection: the second order observer (the observer of the observer) reflects the criteria the first order observer uses. Second order observations come close to "double loop learning" reflecting to basic assumptions of action (Schreyögg & Kliesch 2005). By double-loop learning, the background assumptions ("theories-in-use") that were previously taken for granted and which guide the selection and linking, are called into question (Argyris & Schön 1978). The learned way of doing things is made subject of reflection and thereby opened up to alternative options. In other words, through this observation, strategies and competencies are marked as potentially revisable (Schreyöegg & Kliesch 2005). It is marked with an index of uncertainty and the validity and temporality of competence becomes a critical issue in the organisational discourse.

This research focuses on the problem of the development of a firm's (strategic) innovation capability. What kind of basic theoretical assumptions, basic concepts and methodological solutions make it possible and sensible to analyse the potentials and limitations of innovation and the development of innovation capability, if the context of practical activities and decision-making is adopted as a starting point, and the issue is approached from the perspective of "second-order observation".

In the following, the question of the development of a firm's innovation capability and the potentials and limitations of the development are approached from a problem-oriented perspective, based on existing literature and in particular existing innovation and business research. Chapter three focuses first on existing innovation research and its contribution to the basic commitments and aims of this research project. A central conclusion is that there is a need to define, construct and explicate the approach, subject, problem and context of the research from the point of view of practical activities and decision-making. This Chapter specifies the basic research approaches adopted and basic metaphor of the research subject.

In Chapter four the analysis focuses on central concepts of innovation, innovativeness, innovation capability and strategic innovation pertaining to the normative orientation of research and development. Chapter five departs from the notion that the development of the innovation capability of an enterprise is a time-determined and time-dependent process. How should the evolution/development of the innovation capability of an enterprise be understood with respect to the time factor? The key concept in this analysis is "dynamic capability". The conclusion is that the dynamic capability of an enterprise can be developed if a distinction is made between first-order and second-order observation.

Chapter six deals with the special factors that should be taken into consideration when the target of the research and development work is a group of unknown potential client companies. In other words, which factors should be taken into account when approaching the development of the skills and know-how of enterprises on the enterprise population level. Chapter seven endeavours to delineate the central (limiting) mechanisms (Hedström & Swedberg 1998) affecting the innovation capability of a company. Chapter eight outlines a workable methodological and methodical approach to the problem of the development of the innovation capability of a company.

3. Innovation research and the problem of the development of innovation capability

The original starting point of this research was the idea that the problem of the development of innovation capability can be set, defined and circumscribed contentually based on existing innovation and business research. This idea was complemented by the assumption that an approach and methods to serve the development of the innovation capability of an enterprise or enterprises can also be constructed on the basis of existing innovation and business research. However, it soon became evident that we are facing a highly problematic, complex and contradictory challenge.

Both business research and innovation research are fragmented into many intradisciplinary fractions and traditions with little interaction. For example, innovation research is conducted at least within evolutionary economic theory (for a summary see e.g. Hofer & Polt 1998), history of technology (e.g. Hughes 1983), social shaping of technology approaches (see e.g. Bijker & Law 1992), and German technology genetic research (e.g. Rammert 1997). Innovation management (see e.g. Tidd et al. 1997) is typically concerned with more pragmatic problems. Even within innovation management discussion has divided into separate areas. These include (Tidd 1997) the management of research and development or technology (technology management), new product development and marketing, as well as organisational development and change management. Different disciplines and schools typically have their own research subjects and problem formulations.

As Vergragt et al. (1992) note, in *microeconomic and managerial analyses*, the focus is on the organizational structures (and practices) of firms determining the success or failure of technological innovations. In *evolutionary economics*, the emphasis is rather on the interaction between the technology and its external environment. In *social constructivist theories* of technological innovation, the external social actors seem to play a dominant role in the shaping of technologies, but the economic aspects are not included in the analysis.

As regards to the specific theme innovation and organisations a plethora of books has been written. However, no dominant theoretical perspective have been

emerged to integrate the multiple streams of innovation research and in innovation research there is little in the way of common theoretical underpinnings to guide its development (Drazin & Schoonhoven 1996). The uncommon evolution of the study of innovation may be driven by a set of concerns shared collectively by its research community. The study of innovation appears derive from practical rather than theoretical concerns. Innovation theory has been dominated by normative explanations of how to achieve an outcome seen as central to the interests of managers: increasing the number of innovation generated.

The theory used to explain these outcomes has changed little over 30 years. At its core, innovation theory is an adaptationist perspective guided by three basic assumptions (Drazin & Schoonhoven 1996): 1) innovation is universally desirable for organizations, 2) once an organization increases its size beyond critical mass it becomes more inert, less capable of meaningful organizational change, and only haltingly proficient at innovation, and 3) certain structures and practices can overcome inertia and increase the generation rate of innovation.

Although varied in content and method, most of research on organisations and innovation has been constructed around two core assumptions (Drazin & Schoonhoven 1996). First, researchers have usually portrayed innovation as a universally useful and productive end in and of itself. They have typically not distinguished between types of innovations or examined the commercial success of innovations in the marketplace. Second, the contextual factors that have been examined are numerous but generally represent organization-level features that create contexts hat can be considered as enabling or inhibiting innovation. However, there is need to expand the view of context significantly, examining factors that are not purely organisational in character. On the whole, as Drazin and Schoonhoven (ibid.) suggest, there is a need for additional theoretical integration to link (i) organisational context of innovation and (ii) industry-level dynamics of innovation.

In other words, during the research it became evident that constructing an approach to serve the development of the innovation capability of an enterprise based on existing innovation and business research is a contradictory and problematic task in terms of content, schedule, and social impacts.

To start with, it is a *contentually* problematic and contradictory task. Innovation research has divided into several intradisciplinary and tradition-specific blocks. There is no "dominant" view or approach to adhere to. It is difficult to find a special theory or model on innovation activities or management of innovation processes in enterprises to serve as a basis for developing a workable approach and methods (cf. Burgoyne & Jackson 1997). Creating a "uniform theory" can in practice be considered an overly complex or even impossible task. In different disciplines and traditions innovation processes are approached from contentually different perspectives and problem formulations. There is no common contentual denominator to bridge different research traditions.

Moreover, the innovation activity and development of innovation capability of enterprises is in itself a contradictory process:

- innovation dilemma (Rammert 1988; cf. Christensen 1997)
- technological information and know-how, the functioning and properties of a product are determined by utility value logics; on the other hand, business expertise and know-how, commercialisation and profit-making are based on exchange value logics
- manufacturability issues
- reception and functioning in a practical context
- threat from competing technologies; a technology project may prove outdated even before its completion.

As far as existing innovation research is concerned, we are dealing with a task that is problematic and contradictory also in terms of the *time dimension.* In innovation research the development and diffusion of innovations has typically been analysed afterwards, from the point of view of realised innovations. Traditional innovation research has focused on the ex post reconstruction of historically realised processes. In the InnoPro project the question of the development of the innovation capability of enterprises is rather approached ex ante, peering into the future and focusing on future development potentials. At the same time, experiences indicating that the innovation activities of enterprises

are time-wise uncertain and contradictory processes. In other words, innovation processes are contingent, conditional and situational processes (Drejer 2002)[2].

Developing a workable approach based on existing innovation research is also *socially* problematic. Departing from the traditional objectivistic view of science and "representationistic" information theory, one might assume that it is possible to construct a model based on an outsider view of the factors underlying innovation processes and hence on principles for managing innovation processes. Unfortunately there is no privileged position from which reality might objectively be viewed. What, at any point of time, a social practice is depends on how human agents interpret it to be. And different interpretations constitute different realities (Tsoukas 1996). In other words, the actors and the company management have their own theories of the innovation of products, services and processes. Representatives of enterprises also have their own ideas of the innovation capability of the enterprise and related development needs and challenges – including the notion that no actual development needs exist. These very ideas play a central role in practice. A universally relevant and applicable theory or model of innovation and the management of innovation processes does not and cannot exist. Innovations emerge and diffuse in a multilateral and multicentered world where many centres and data banks for steering and managing innovations exist simultaneously (cf. Luhmann 1995).

Thus there is no ready-made, self-evident, integrating, systemic approach or theory to serve and direct the development of the innovation capability of enterprises. For this very reason, it is necessary to set, define and construct the subject, problem and context of research rather from the *point of view of practice and cooperation* – critically assessing, utilising and applying existing innovation research and the theory and strategic management concepts of the enterprise. In other words, one way to untangle the problems is to depart from the above-mentioned problem of enterprise representatives having their own views on the innovation capability of the enterprise and related development needs and

[2] In an essential sense, innovation concerns the search for, and the discovery, experimentation, development, imitation and adoption of new products, new production processes and new organisational set-ups. Almost by definition, what is searched for cannot be known with any precision before the activity itself of search and experimentation, so that the techical (and, more so, commercial) outcomes of innovative efforts can hardly be known ex ante. Innovation involves a fundamental element of uncertainty (see e.g. Dosi 1988a).

challenges. This, again, is closely linked to the problem of *intervention* and *cooperative development*.

The discussion about problems and adequate forms of intervention by social scientist is dominated by two paradigms (Moldaschl & Brödner 2002). The first is the model of knowledge transfer from science into practice. The roles of subject and object are of intervention and research are well defined, with the researcher or consultant as the subject, and the organisational members as the object of change, even if their participation is allowed or desired. Moldaschl and Brödner (ibid.) call this model *expert-centred* or prescriptive, or "expertocratic". It starts from the assumption that scientific knowledge is superior to the practitioner's knowledge, and allows the deduction of unambiguous, empirically provable design criteria. The repertoire of methods for change is underdeveloped because this approach assumes that the intended effects will be achieved when the recommendations are detailed enough and their application is precisely controlled.

The second model dispenses with the idea of an optimal solution, or with the idea of clear causalities between an external context an requirements for organisational solutions (Moldaschl & Brödner 2002). Instead, it is assumed that the relevant knowledge is already present in the organisation, and it only has to be mobilised by stimulating and moderating organisational communication. In this view, organisations and groups should be supported only in processes of self-organisation by communicative procedures. There is no claim of superior expert knowledge, except the communicative aspects. Moldaschl and Brödner (ibid.) call the interventionists of this model procedural experts, and the paradigm *proceduralistic or discursive*, because it restricts itself to procedural methods, and claims to refrain from inducing external goals, models, norms and values. The social scientist or consultant understands himself as a mediator of self-change, as a communicator who helps people to develop a common view on an organisational problem, and to achieve a consensual definition of a goal.

With the concept of a "*reflexive methodology of intervention*" Moldaschl and Brödner (2002) propose an alternative *beyond* to both of the dominant paradigms. This alternative is inspired by anti-rationalistic epistemological positions, which understand science as one practice, and practice as situated action. Reflexivity in its cognitive dimension emphasizes the specificity of

practice, looks for the embeddedness of action and thinking in specific contexts, and concentrates on the recursive production (co-evolution) of context and action. As a consequence, it argues against the search for universal principles of intervention. Being reflexive means that an action researcher or consultant is aware that she or he can neither be value-free nor control the effects of her intervention; she knows that her own categories, concepts, ideas and interpretations are always situated; her activity is based on numerous undiscovered conditions; her intervention will cause side effects; and finally, she would replace substantialist categories by a relational thinking.

Moldaschl and Brödner (2002) propose some heuristics for the reflexive methodology of organisational intervention:

- *Legitimacy and power of an intervention*. It is necessary to think in two categories of contract: a formal one, constituting a legal and an economic commitment, and a social one, constituting trust relations and mutual commitment between the external expert and each social group he works with.
- *Focus on side effects*. Reflexivity means being aware of the contextual embeddedness of activities and strategies. Reflexive methodology of intervention focuses on side effects on both levels of strategy-in-practice: the practitioner's and the scientist's. The iterative evaluation of strategies with respect to the actual outcomes of intervention is a central practice of reflexive methodology.
- *Conceptualisation*. To follow a reflexive methodology of intervention means to remain sceptical of any universalism, any recommendation of "one-best-way" or "best practice". Any social system has its history, culture and context, and must be treated according to that specificity. Instead of offering general problem solving models, the researcher would prefer a thinking in dilemmas.
- *Reflexivity through expert knowledge*. In contrast to procedural paradigm, reflexive scientists assume that not all necessary knowledge is given in the respective organisation, and that knowledge transfer makes sense. Reflexive methodology draws attention of the practitioners to alternatives, or offers them the opportunity for a co-construction of alternatives. This implies mistrusting former reasoning, and opening mentally closed spaces of action.

Reflexive scientist pleads for an institutional reflexivity instead of rule-following behaviour. This requires from the external expert a deep contextual knowledge of models and practices in the specific branch or industry, as well as the specific organisation in order to assess their applicability.

- *Decentering – the power of questioning*. Only if we are aware that not only the practitioners but also researchers are loaded of implicit theories can we open to discover and question implicit values and intentions. Reciprocal openness and observation between researcher and practitioner are a central element for the legitimacy of intervention.
- *Confinement of identities*. A methodology of reflexive intervention will only be able to increase the reflexivity of practice if it is aware of, and care for its particular identity, its relative autonomy. A reflexive methodology of intervention implies accepting the legitimacy of the practitioner's rationalities, and does not claim a superior scientific rationality. At the same time, it encourages the researcher to insist on a difference in perspectives, and to use this difference as a means of productive puzzling of implicit everyday assumptions.
- *Recentering*. Recentering emphasises action. Reflexive researchers will not assume that they could succeed in remaining "independent". They are aware that there is no presence in the field without effects; that they intervene merely by observing, asking and answering. They gather experience through participating in practice, try to apply what they have learned by decentring, and utilise the effects of being actors among actors.
- *Politics and organisational change*. The idea of reflexive intervention accepts that there is a difference between perspectives or interests between science and practice. But this is only the special case of a social constructionist view which assumes that different social practices – with science as one of them – create different perspectives and interests. It is necessary, therefore to refer to adequate organisation theories. Reflexive researchers would never assume a uniform organisational purpose or goal. Instead, attention would be focused on the structuring interplay of these different interests.

As Moldaschl and Brödner (ibid.) put it, the reflexive intervention approach requires the support of an adequate theory concerning the subject of research and development. Their concept of reflexive intervention is contentually related to the development of work and work organisations. The development of work and work organisations has a relatively long tradition as a subject of the sociological and psychological study of work.

Departing from the reflexive intervention approach and expanding its scope of application, we need to ask, what kind of basic assumptions, concepts and metaphors systematic research and development work should be built on when the problem formulation involves the development of the innovation capability of an enterprise and the focus is on intervention and cooperative development.

One key premise of the research is the notion that innovation activities and development of the innovation capability of enterprises are not necessarily a priori a self-evident and inherently valuable goal (cf. Drazin & Schoonhoven 1996). Underlying this notion is the finding that the corollaries (proliferation of cars) of an innovation (car) may also be harmful. The development of the innovation capability of an enterprise – and innovation activity as a rule – is a contradictory, paradoxical and hence a discursive process.

As Rammert (2000) notes, Schumpeter once discerned the paradox of innovation. He called the double dynamics of innovation as a process of "creative destruction". Innovation means *creation of new combinations* of methods and machines *and* at the same time *radical devaluation* of produced values, including well-functioning machines, effective production methods, and highly qualified workforce.

The second key starting point of the research is the idea: What, at any point of time, a social practice is depends on how human agents interpret it to be. And different interpretations constitute different realities (Tsoukas 1996). In other words, actors in enterprises and the management itself may have their own theories of the reform and innovation of products, services and processes. Representatives of enterprises also have their own views on the innovation capability of the enterprise, as well as the needs and challenges for its development – including the idea that no such development needs actually exist.

The views of the active actors play a central and fundamental role as regards practical activities and decision-making.

The third key starting point of the research is the idea that practical decision-making and activity is linked to a wider network and context consisting of many specialised actors and decision-makers. Practitioners and decision-makers are connected to a world, enterprise population and context of a certain sector that are distributed and multicentered in terms of the division of labour. As Porac and Thomas (2002, 173) note, organisation is not a strategically isolated entity. It is one element in a broader population of organisations, each of which is using the others as a reference point for their own strategising and sensemaking activities.

From these starting points, the central contentual tasks and questions of the research can now be delimited and concretised as follows.

The subject of the research and development project are enterprises and, in particular, small and medium-sized enterprises. The development of the innovation capability of an enterprise refers to collaborative joint efforts and "productive inquiry and development" (Dewey) of the firm's innovation capability between researchers and the firm's representatives. Research and development work builds on the reflexive intervention methodology and heuristic principles (see above). This leads us to the question of how the development of a firm's innovation capability can be perceived so that it makes sense. This, again, requires specific insight into "innovation capability", the "enterprise" as well as the mechanisms affecting the innovation capability of enterprises (Figure 2).

The primary challenge of this research is to answer the question about the content of the specific view of the innovation capability of the enterprise/enterprises that steers the systematic research and development. Should the problem and task be limited to the level and framework of certain internal functions or processes of the enterprise (R&D, product development, management of product development processes)? Or should the firm's innovation capability and its evolution and development be defined in a more comprehensive and more systemic way? The specific starting point of the research is the notion that the innovation capability of an enterprise/enterprises has to do with systemic ability (inability) arising from the combined effect of

many factors. The innovation capability of an enterprise is by nature a relational concept: in fact it refers to the communicative relation between the enterprise and the environment; the innovation capability of an enterprise is realised in the form of new kinds of offerings, products, services and delivery contents.3 As a relational concept, the innovation capability of an enterprise also refers to its specific know-how and its distinctness from other actors and competitors in the same field.

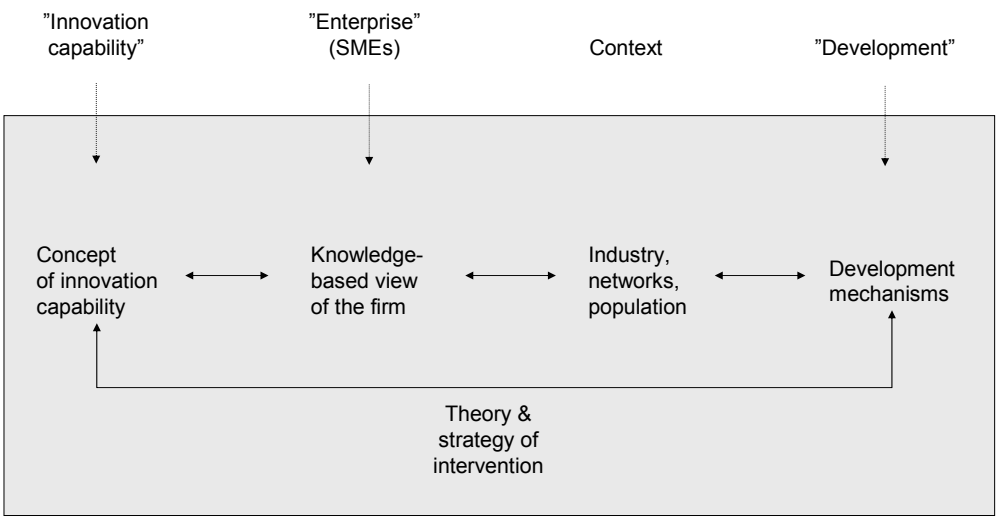

Figure 2. Design of the study.

Another task of the research project is to answer the question on how the innovation capability of an enterprise is expected to develop. This requires special insight into both the enterprise and factors and mechanisms (for more on concept of “mechanisms” see Elster 1989; Hedström & Swedberg 1998) affecting the development of its innovation capability.

Chapter five focuses on the question of the innovativeness and innovation capability of an enterprise. Chapter six specifies the view of the enterprise used to steer research and development work. Chapter seven approaches the enterprise and enterprises from the perspective of a broader group of enterprises

[3] “We suggest that innovation is a core process concerned with *renewing what the organization offers* (its products and/or services) and *the ways in which it generates and delivers these*” (Tidd et al. 1997, 14).

and business networks. Chapter eight endeavours – still on the level of an enterprise population – to outline the central mechanisms affecting the development of the innovation capability of enterprises. Chapter nine focuses on the synthesising approach on the level of an individual enterprise. Chapter ten specifies the central methodological choices concerning the research and development work.

4. Innovation and innovativeness

The Oxford English Dictionary defines innovation as "making *changes to something established*". Invention, by contrast, is the act of "coming up or finding: discovery". Innovations frequently *disrupt* the way that business do things and may have been doing them for years. (www.tutor2u.net//Economics of Innovation.)

Many ideas proposed by the "father" of innovation research, Joseph Schumpeter (1912), are still topical. Unlike later innovation research, Schumpeter was not primarily interested in (technological) innovations as such. Schumpeter was interested in the development and cyclical changes of the economy. The birth and diffusion of innovations are factors that are useful in understanding and explaining economic cycles. Schumpeter viewed innovations from the perspective of economic development and dynamics of growth. Entrepreneurs and entrepreneurship are engines of development and growth.

According to Schumpeter (1912), innovation means "introducing and carrying out new combinations". New combinations of means and factors of production may be realised in the form of 1) new goods 2) new production methods 3) new sales markets 4) new procurement sources 5) new ways to organise operations. Entrepreneurs and entrepreneurship play a key role in the introduction and diffusion of innovations (Schumpeter 1912; see also Drucker 1985). This is ultimately a question of struggle, leadership and overcoming resistance. Entrepreneurship and the ability to wage a persistent struggle distinguishes entrepreneurs from "masters" and "capitalists", who may assume some financial risks by financing innovations but are not personally involved in the carrying through of the innovations. Entrepreneurship and entrepreneurial skills are scarce resources, because innovations represent to Schumpeter something that is not normal and ordinary, and are realised only after overcoming the "law of inertia of the social mass".

For Schumpeter, companies engaged in entrepreneurship are the key actors in an economy. The basic mechanism behind economic growth and development is competition between enterprises and entrepreneurs based on innovation. In fact, Schumpeter developed two versions of the theory of the introduction and diffusion of innovations (Nelson & Winter 1982; Lemola 2000). The first version

(Schumpeter 1912) focuses on SMEs and entrepreneurial operations. New innovators, SMEs with their new ideas, products and processes join industrial production. They cause changes in production and distribution systems and replace old innovations with new ones. In the latter model (Schumpeter 1943) SMEs were replaced by big ones. The entrepreneurial operations of SMEs were replaced by the centralised research organisations of big enterprises. Their extensive financial resources, accumulating technological-scientific knowledge and know-how and ability to run research, development and commercialisation projects effectively diminish the significance and role of SMEs.

Schumpeter's innovation concept can be described as quite comprehensive. Besides technological changes it also considers *organisational, institutional* and *social* innovations and their significance to the development of enterprises and the economy[4].

The current discussion about innovations and innovation competition is very much focused on technical innovations. But the innovation concept is not restricted to technical innovations. Schumpeter already had a much broader concept, defining innovations as the doing new things or the doing of things that are already done in a new way (Schumpeter 1939, 87). New production processes, new organisation forms, the opening of a new market, the development of new products as well as new ways of marketing are perceived as innovation by Schumpeter.

4.1 Three inherent aspects of innovation

The concept of innovation is often confused. In thinking about innovation, people have in mind – and confuse – three different conceptualisations (Tether 2003). The first is *innovation as achievement*. The second is the *consequences* or impacts that arise from achievements. The third is the *capacity to change*.

[4] Womack et al. (1990) argued that it is because of *social* and not so much because of technological innovations that Japanese car producers could take the lead in global competition. Academic refer to new organisation forms, management practices and work regulations to explain the success of Japanese companies on the global market. The following typology gives an overview of the variety of social innovations (Schienstock 1999): new organisational forms within and between companies (team work, several networks), new services, new social techniques (telework at home), new patterns of servicing demands (tele-learning), new patterns of consumption, new institutions etc.

Innovation as (technological) achievement

When we think about our lives and the technologies that enhance them we think about innovations as achievements (Tether 2003). When we think about "great innovations" we tend to think primarily about the impact of the innovation, but that impact was rarely if ever fully anticipated at the time the innovation was first introduced. There are many examples of inventors failing to recognise the potential of their ideas. In addition, most "great innovations" are part of technological systems, which were not invented in a flash of genius, but have instead evolved over time. One reason why some technological advances are not adopted to any great extend is because "mainstream technologies" are often cumulative, that is they are patterned and build upon one another. Some radical technologies are overlooked because they imply too much disruption to the existing system. When we think about innovations as achievements, we should try to think about them in their technological and temporal context (ibid.).

Innovation as the consequences of achievements

"Great innovations" are primarily thought great because of the consequences of technologies, and not necessarily because of the novelty of the achievement itself, which in any case has usually transformed substantially from the original achievement through the accretion of little details (Tether 2003). There is two things – one is the achievement itself, the second is the extend to which it is valued or comes to have an impact on our society. Two aircraft, Concorde and Boeing 747, were developed around the same time and along certain technological trajectories. Concorde was the more impressive technological feat, but was never profitable. Meanwhile, Boeing 747 has become the symbol of the success of global aviation (ibid.).

What is important here is that innovations tend to have *unintended consequences*. Economists could designate these unintended consequences positive and/or negative externalities. One way to look at the consequences of innovations is in terms of their relationship to existing capabilities of other players and companies in industries. Innovations – as discontinuities – can either enhance or destroy existing competencies (Tuschman & Anderson 1986; Henderson & Clark 1990; see also Christensen 1997). *Competence-enhancing innovations* represent incremental improvements either in the price-quality ratio,

or in the performance of existing products. Similar innovations replace the old technique, but without nullifying the existing knowledge-base. *A competence-destroying product* discontinuity either creates a new product class or substitutes existing one. Competence-destroying *process* discontinuities represent a new way of making a given product. Competence-destroying process breakthroughs may involve combining previously discrete steps into a more continuous flow or may involve a completely different process.

Competence-destroying discontinuities are so fundamentally different from previously dominant technologies or modes of operation that the skills and knowledge base required to operate the core technology shift. Such major changes in skills, distinctive competence, and production processes are associated with major changes in the distribution of power and control within firms and industries (Tushman & Anderson 1986, 442). For example, the ascendance of automatically controlled machine tooling increased the power of industrial engineers within the machine-tool industry, while the diffusion of high-volume production processes led to the rise of professional managers within more formally structured organisations (ibid.). On the hole one could say that *paradox of competence-enhancing and competence-destroying tendencies* is an inherent feature of all kind of innovations.

"Architectural innovations" refers innovations that change the architecture of a product without changing its components (Henderson & Clark 1990). Henderson and Clark (ibid.) showed that architectural innovations could destroy the usefulness of the architectural knowledge of established firms, and that since architectural knowledge tends to become embedded in the structure and information-processing procedures of established organisations, this destruction if difficult for firms to recognise and hard to correct. Much of what the firm knows is useful and needs to be applied in the new product, but some of what it knows is not only useless but may actually handicap the firm. Recognising what is useful and what is not, and acquiring and applying new knowledge when necessary, may be quite difficult for an established firm because of the way (architectural) knowledge is organised and managed (Henderson & Clark 1990, 13). One could say that architectural innovation confuses the collective mind (Weick & Roberts 1993) – dominant logic, recurrent patterns of interaction, problem solving strategies etc. – of the established organisation.

Innovation as "dynamic capabilities"

A conceptualisation of innovation as a process is becoming more widespread. Innovation is less associated with particular acts or achievements, and is more associated with an attitude of mind, and a whole ensemble of behaviours and practices associated with that attitude (Tether 2003). Advances in technology or other areas of human endeavour rarely happen by chance, and even if they do, "chance favours the prepared mind" (Louis Pasteur). Research, development and innovation can be seen as systematic, managed and leaded processes. They are processes focused on to ability to learn and adapt. A truly innovative firm is not the one that introduces a new product "once in a blue moon", but is instead one that is continuously engaged in practices intended to enhance the probability that it will discover new or better products or processes of making them. Central to this concept of innovation is *being alive to change* (Tether 2003). Being flexible, that is, being able to adapt what is done in different circumstances, such as to particular customer needs, is usually insufficient to constitute being truly innovative.

Innovation alone may not always lead to business success. Although there is evidence to connect innovation with performance, success depends on other factors as well. If the fundamentals of the business are weak, then all the innovation in the world may not be sufficient to save it. This argues for strategically focused innovation as part of a "balanced scorecard" of results management (Tidd et al. 1997, 37).

We also need to consider the time perspective. The real test of innovation success is not a one-off success in the short term but sustained growth through continuous invention and adaptation (ibid.). It is relatively simple to succeed once with a lucky combination of new ideas and receptive market at the time – but it is quite another thing to repeat the performance consistently.

4.2 Innovation capability of the firm

Establishing and classifying the novelty value of innovations, for instance, as "radical" or "incremental" often depends on the perspective and level of observation. Technological systems are often characterised by a hierarchical composition (Constant 1987). For example, a radical innovation on the level of

microchips is not necessarily a radical innovation from the perspective of aircraft construction which utilises the microchips. Or, after the radio had been invented, reinventing it was no longer a new invention – but installing it in a car, that is, the invention of the "car radio" can be considered a new innovation. Thus, the novelty value of an innovation depends on the level of observation.

Constant (1987) proposes actually three different social loci for technological practice: 1) the technological community, 2) the complex organisations or corporations and 3) the technological system. Technological knowledge is expressed in well-winnowed traditions of practice that are the possession of well-defined communities of technological practitioners. For example, turbojets are designed by a collection of engineers and other specialists, who together constitute an identifiable community of practitioners. Turbojets are designed within and manufactured by a handful of complex organisations that are lumped together as an industrial sector, which is a way of expressing the structure of practice at a more aggregate level (ibid., 224–225).

As Constant (1987, 231) further notes, people – as customers – rarely buy either technological knowledge or large technological systems in their entirely. People buy artefacts or the output of complex system. Purchase or use of almost any modern technology is mediated by the complex organisations that are required to integrate the knowledge and resources necessary to produce and distribute the artefact or service. This custom of buying an organisationally mediated function, not knowledge or a system as such, has two related implications (ibid.). First, technological knowledge is newer pure, it is to be expressed as a tactile, functional artefact. This implies the cooperation of adherents of multiple communities of practitioners, and the integration of this multiple expertise in turn implies complex organisation (company). Second, that organisation is required invokes a vast array of organisational variables in the performance of function. The necessity of social organisation also redefines technological function (ibid., 232). I not only want a car that is built in accordance with the basic principles of physics and in light of an empirically verified, well-winnowed tradition of automobile design, but I also want it screwed together right. Quality, reliability, service, style, economy of operation, expected resale value – all matter and all are to a major degree a function of organisational decisions and efficacy rather than pure technical solutions to pure technical problems.

Hence, the concept of innovative capability of the firm is functionally definable in two ways: as an integrative capability or function of the firm and as a communicative function of the firm. Integrative function refers to the production of innovation and communicative function to the diffusion of innovation.

As Lawson and Samson (2001) note, there is no one generic formula of innovation capacity. Innovation capacity can proposed as a *higher-order integration capability*, that is, the ability to mould and manage multiple capabilities. An innovation capability can be defined as the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders. Innovation capability itself is not a separately identifiable construct. The capability is composed of reinforcing practices and processes within the firm.

Teece et al. (1997; see also Zollo & Winter 2002), in turn, define *dynamic capabilities* as the firm's ability to *integrate*, *build*, and *reconfigure* internal and external competences to address rapidly changing environments. Dynamic capabilities thus reflect an organization's ability to achieve new and innovative forms of competitive advantage given path dependencies and market positions.

On the other hand – from the viewpoint of the diffusion of innovations – the innovation capability of an enterprise refers to a (communicative) relation between the enterprise and the environment. Also in this sense, innovation capability is a relational concept, and is realised in the form of offerings presented by the enterprise to the environment and (renewal of) delivery contents. As Vos (2002, 5) notes, neither the environment nor organisational capabilities mean something on their own. The environment means only something with respect to organisational capabilities and organisational capabilities mean only something with respect to the environment.

As Rogers (1995, 5) states, diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. It is a special type of communication, in that the messages are concerned with new ideas. According to Rogers (ibid., 5–6) communication is a process in which participants create and share information with one another in order to reach an mutual understanding. Communication is a two-way process of convergence or divergence, rather than a one-way, linear act in which one seeks

to transfer a message to another in order to achieve certain effects. For example, the client may come to the change agent with a problem, and the innovation is recommended as a possible solution to this need. The change agent-client interaction may continue through several cycles, as a process of information exchange. Thus, diffusion is a special type of communication, in which the messages are about a new idea or solution. The newness of the idea means that some (large) degree of uncertainty is involved in diffusion. Uncertainty is the degree to which a number of alternatives are perceived with respect to the occurrence of an event and the relative probability of these alternatives.

From diffusion point of view, an innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behaviour is concerned, whether or not an idea is objectively new as measured by the lapse of time since first use or discovery. The perceived newness of the idea for the individual determines his or her reaction to it. If the idea seems new to the individual, it is an innovation (Rogers 1995, 11).

Innovation capability of the firm is realised, in the end, in the form of offerings. Tidd et al. (1997, 14) have suggested accordingly that innovation could be described as a process concerned with renewing what the organisation offers (products, services or solutions) and the ways in which it generates and delivers these (process innovation). However, before these offerings are offered and realised in the market, managers or entrepreneurs must *recognise or discover opportunities for profitable change*. Because opportunities do not appear in a prepackaged form, this process of opportunity identification is far from trivial. Entrepreneurs could fail to identify any opportunities, or could identify wrong opportunities, making an explanation for the discovery of opportunities an important part of the domain of entrepreneurship (Shane 2000). In this sense innovation and innovativeness refers *at the outset* to the *recognition of opportunities for profitable change and the pursuit of those opportunities all the way through to their adoption in practice* (Baumol 2002, 10)[5].

[5] Baumol (2002, 57) uses the term "entrepreneur" in the Schumpeterian sense to mean the imaginative deviator from established business patterns and practices, who constantly seeks the opportunity to introduce new patterns and new procedures, to invade new markets, and to create new organisational forms. The entrepreneur is the *independent innovator*, meaning that the activities of this individual include, but go considerably beyond, technical inventions and their utilisation.

In addition, as Francis and Bessant (2005) have noted, defining innovation in terms of offerings is to that extent insufficient that it does not take into account explicitly two essential dimensions where innovation is possible – market position and business models. Thus, firm's "opportunity space" of innovation contains actually *four* potential dimensions of opportunities (ibid.):

- P1 innovation to introduce or improve *products*
- P2 innovation to introduce or improve *processes*
- P3 innovation to define or re-define the *positioning* of the firm or products
- P4 innovation to define or re-define the dominant *paradigm* of the firm.

In other words (ibid.), it is possible for a firm to introduce a commercially successful new type of market offering or a commercially successful offer process, just by repositioning itself (P3), or by redefining its basic operating principles (P4).

4.3 Strategic innovation

Markides (2002) has examined several business companies which have succeeded in attacking an established industry leader *without* to help of a radical technological innovation, without riding the wave of technological discontinuities. In fact, according to Markides (ibid.), they *broke the rules of the game* in their industry. The common element in all successful attacks was *strategic innovation*. Significant shifts in market share and fortunes occur not because companies try to play the game better than the competition but because they change the rules of the game.

Markides (2002) notes that without the benefit of a new technological innovation, it is difficult for any firm to successfully enter a new market where established players exist. According to Markides (ibid.), the strategy that seems to improve the probability of success in those situations is the strategy of breaking the rules, that is, strategic innovation. On the other hand, if product innovation is to be really successful and process innovation it to show its true worth, there must be new strategies to help and to encourage them. The creativity will be apparent because the new strategy will typically break some

established norm or rule and challenge accepted thinking about how the organisation as a whole should behave (Baden-Fuller & Pitt 1996).

Creativity and innovation have traditionally been associated with areas such as product development and marketing. More recently, there has been a call for greater innovation and creativity in *strategy development* (Styles & Seymour 2004). The argument for strategic innovation is voiced by number of academics and consultants. Influential writers in this new strategic innovation movement include e.g. Hamel and Prahalad (1994), Drucker (1998), and Markides (1999).

The theoretical foundations underpinning the new strategic innovation movement come from two sources (Styles & Seymour 2004; Styles & Goddard 2004). The first is the resource-based theory of the firm, originally drawing from the writing of Edith Penrose (1959). The second is the work of the economist Schumpeter (e.g. 1939), and his concept of "creative destruction".

Traditional approaches to strategy development are best suited to maximising value from current business models, but are too rigid for developing *entirely new business models*. Innovation requires nonlinear creativity, which could be considered the antithesis of normative checklists. In fact, strategies have *lifecycles* in the same way that products do. The strategist therefore has two tasks: 1) maximise value from the current business model; and 2) develop the new business model that will ultimately "destroy" the old (Styles & Seymour 2004).

However, as Markides (2002) notes, it is not enough to proclaim the virtues of breaking the rules and to prompt companies "just do it". It is easy to argue for innovation and to dissect strategic successes afterward. Over and above deciding when it makes sense to break the and when it is better to play the existing game, the real question is, is there a systematic way of thinking about the issues that allows a company to come up with ideas that break the rules? According the Markides (ibid.) strategic innovation could occur when a company identifies gaps in the industry positioning map and decides to fill them. Gaps refers to 1) new, emerging customer segments that other competitors have neglected; 2) new, emerging customer needs or existing customer needs not served well by other competitors; and 3) new ways of producing, delivering, or distributing existing or new products or services to existing or new customer segments. Gaps appears for a number of reasons, such as changing consumer tastes and

preferences, changing technologies, changing policies, and so on. Gaps can be created by external changes or proactively by the company.

How can a company proactively and systematically think about and develop a new game plan or model of business? According to Markides (2002) five generic approaches of the successful strategic innovators can provide clues (see also Chapter 9 in this publication):

1) Redefine the business.
2) Redefine the *who*. Who is our customer?
3) Redefine the *what*. What products or services are we offering these customers?
4) Redefine the *how*. Companies should leverage existing core competencies to build new products or a better way of doing business and then find the right customers.
5) Start the thinking process at different points. For example, instead of thinking, this is our customer, this is what he wants, and this is how we can offer it, start by asking, what are our unique capabilities.

These methodological solutions serving the development of the strategic innovation capability of an enterprise will be discussed in more detail in the last Chapter of this publication. However, before that we need to discuss more systematically the research approach to an enterprise and engage in a closer analysis of mechanisms that may limit the development of the strategic innovation capability of an enterprise.

5. The firm as knowing system

In Eisenhardt's and Santos's (2002) words the knowledge movement is sweeping through the field of strategy. The last several years have witnessed the widespread use of a knowledge perspective for research on a variety of topics within strategy, including alliances, capabilities transfer, acquisitions and product development. An emerging knowledge-based view (KBV) of strategy underlies this research. Customary knowledge-based view considers knowledge as the most strategically significant resource of the firm, and its proponents argue that heterogeneous knowledge bases and capabilities among firms are the main determinants of sustained competitive advantage and superior corporate performance.

Organisational learning can be seen as a part of the foundation that underlies knowledge-based thinking (Eisenhardt & Santos 2002). Learning can be defined as the process by which new information is incorporated into the behaviour of agents, changing their patterns of behaviour and possibly, but not always, leading to better outcomes.

As Eisenhardt and Santos (2002) note, Penrose's seminal work on the growth of the firm (1959) is an important starting point for understanding organisational learning. Penrose describes how learning processes create new knowledge and form the basis of the growth of organisations through the recombination of existing resources. Cyert and March (1963) developed significant thinking around the concept of organisational *routines*. Organisational routines form the basis of collective learning in organisations. Nelson and Winter (1982) were among the first to integrate organisational knowledge and routines with the notion of dynamic competitive environments. Cohen and Levinthal (1990) related organisational learning and innovation to the evolving knowledge base of the firm. They define *absorptive capacity* as the ability to recognise the value of information, assimilate it and apply it to commercial ends. They argue that the ability of a firm to recognise the value of new, external information, assimilate it and apply it is critical to its innovative capabilities. Absorptive capacity is largely a function of the level of the firms' prior knowledge and is *history or path dependent*. The cumulativeness of absorptive capacity and its effect on *expectation formation* suggest an extreme case of path dependence in which once a firm ceases investing in its absorptive capacity in a quickly moving field, it may never assimilate and exploit new information in that field, regardless of the value of that information.

Path dependency on the one hand allows for adaptive learning and development. Companies are able to fully exploit the productivity and innovation potential of the existing development path. However, path dependency can also lead to core-rigidities (Leonard-Barton 1992) and lock-ins (see e.g. Grabher 1993). A lock-in exist if a specific development path in an economy or in an industry exhausts itself, which is indicated by a loss of competitiveness, innovativeness and retarding economic growth.

Brown and Duguid (1991) have further proposed a unified view of *working, learning and innovation*, which links individual and organisational levels of knowledge. Brown and Duguid argue that learning theory should be distanced from codified, transferable and objective notions of knowledge, and focus instead on *knowledge in context*. In their view, meaningful knowledge is deeply related to daily work, and the acquisition of new knowledge is socially constructed from working practices[6]. This social construction of knowledge occurs within *informal communities-of-practice*, where knowledge is shared through collaborative mechanisms such as narration and joint work. Communities-of-practice are likely to engage in innovative activities because their view of the world is constantly challenged by the demands of daily work. This perspective on organisational learning and innovation implies a view of organisations as *multiple* communities-of-practice (Eisenhardt & Santos 2002).

In summary, it can be stated that informal practical communities extend beyond the boundaries of enterprises and organisations (cf. Brown & Duguid 2001) so that, for example, the practical activities, know-how and identity formation of the people responsible for product development and product design in an enterprise are strongly connected to a practical community of, for example, "machine design engineers". Likewise, the practical knowledge, activity and identification of the company management – especially in SMEs – may be strongly connected to the practical community of "business executives of the field".

[6] As Brown and Duguid (2001) note, learning doesn't just involve the acquisition of facts about the world, it also involves acquiring the ability to act in the world in socially recognised ways. People become managers or engineers not only by modelling themselves on managers or engineers, but also by gaining the acceptance and recognition of managers and engineers. Learning involves acquiring identities that reflect both how a learner sees the world and how the world sees the learner.

The growing interest in the knowledge-based view of strategy or in the knowledge management does however not concur with a growing clarity and depth on what the concept really means (Schreyögg & Geiger 2002) or how we could make sense of it.

The process or practice of knowing, as opposed to knowledge as resource, has been the focus of the critical perspective towards the dominant knowledge-based view. Cook and Brown (1999) argue that tacit and explicit knowledge are distinct forms of knowledge. White tacit knowledge might be useful to generate explicit knowledge and vice-versa, one type of knowledge cannot be converted into another. Individual and group knowledge also are distinct forms of knowledge. These distinct types of knowledge are linked to the processes of knowing, which are deeply related to the interaction of individuals with the world.

Cook and Brown (1999, 386–390) outline some guidelines toward an epistemology of practice. In common usage practice can mean either to develop a competency through drill or rote actions as in "to practice the piano" or to exercise a competency as in "to practice medicine". The former suggest drill in preparation for doing the "real work", while the latter suggest the "real work" itself: the practice of managers, engineers, physicians, woodworkers, etc. Correspondingly we can say that the term "practice" refers to *the coordinated activities of individuals and groups in doing their "real work" as it is informed by a particular organisational or group context*. In this sense it is possible to distinguish practice from both behaviour and action. Doing of any sort we could call "behaviour", while "action" refers to the behaviour imbued by meaning, whereas the term "practice" refers to the action informed by meaning drawn from a particular group context. If the physician raps the patient's knee as part of an exam, it is practice. This is because the meaning of her action comes from the organised context of her training and ongoing work in medicine where it can draw on, contribute to, and evaluated in the work others in her field.

Cook and Brown (1999, 387) use the term "knowing" to refer to *the epistemological dimension of action itself*. Knowing refers not so much something that is *used* in action or something *necessary to* action, but rather something that is a part of individual or group action. Knowing refers to the epistemic work that is done as part of action or practice, like that done in the actual making of a medical diagnosis. Following the ideas of American

philosophical school pf Pragmatism, and in particular the work of Dewey, "knowing something" refers to an *aspect of* action or practice, not to something assumed to underlie, enable, or be used in action. To be accomplished in a profession, discipline, or craft is necessarily tied up with *practicing it*. If you want to understand the essentials of what accomplished engineers know, you need to look at what they do as well as at what they possess. This also means that we must see knowledge as *a tool at the service of knowing* not as something that, once possessed, is all that is needed to enable practice. Respectively improved practice may not always be the product of acquiring more knowledge. At times it may be the result of developing innovative ways of using knowledge already possessed.

Since knowing is as aspect of action or practice, it is about interaction with the world. Correspondingly knowing does not focus on what we possess in our heads. It focuses on our interactions with the things of the social and physical world (Cook & Brown 1999, 388–389). "Knowledge" is about possession. "Knowing" is about relation: it is about interaction between the knower(s) and the world. To interact with the world effectively we need to *honour* the world and the properties of the world[7]. One cannot make reliable objects for example through the haphazard use of clay or steel. Similarly, in the social world, one must honour the strengths, limitations, and character of individuals and groups to engender coordinated and directed practice – as for example all good managers at least intuitively knows, as do the members of such group.

Within the relational and interactive character of knowing, the world shapes our actions by requiring that we honour it, just as we shape the world by interacting with it in a disciplined way. In sum, knowing is to interact with and honour the world using knowledge as a tool (Cook & Brown 1999, 389).

Legitimate peripheral participation

From the concept of the epistemology of practice there is connection to the learning as a "legitimate peripheral participation" (Lave & Wenger 1991). In legitimate peripheral participation learning is conceived occur as individuals (or groups) become members of the communities of practice. To know is to be

[7] One can remind us that complexity of the world, market and power relations etc. constitute the world.

capable of participating with the requisite competence in the complex web of relationships among people and activities.

Within communities of practice it is not the acquisition of skill or knowledge with the universal currency that identifies the "competent" member. Rather, it is a demonstrated ability to "read" to local context and act in ways that are recognised and valued by other members of the immediate community of practice that is all-important (Lave & Wenger 1991). In this respect learning is not adequately understood as the transmission or acquiring of information or skill but inter alia involves the construction of identities (Lave & Wenger 1991; Contu & Willmott 2003). People do not simply learn *about*; they also learn *to be* (Brown & Duguid 2001). Learning does not just involve the acquisition of *facts about* the world. It also involves acquiring the *ability to act* in the world, and it involves acquiring the ability to act in the world *in socially recognised ways* (ibid.). That is, it is not enough to claim to be an engineer or a manager; people, particularly other engineers or managers, have to recognise you as such. People become managers or engineers not only by modelling themselves on managers or engineers, but also by gaining the acceptance and recognition of managers or engineers.

The firm as a distributed knowledge system

Weick and Roberts (1993) have developed the notion of *collective mind* in order to explain organisational performance in complex situations requiring continuous *operational reliability*. Processes of mind are presumed to be inherent in *all* organisations. Collective mind refers to actors or individuals who act as if they are group. "Mind" is a dispositional term that denotes a propensity to act in a certain manner or style. Collective mind is conceptualised as a pattern of heedful interrelations of actions in a social system. Just as the individual could be located in the specific activities individuals engage in, so the collective mind is manifested in the manner in which individuals interrelate their action. Actors in the system construct their actions (contributions), understanding that the system consist of connected actions by themselves and others (representation), and interrelate their actions within the system (subordination). As heedful interrelating and mindful comprehension increase, organisational errors decrease. Thus, reliable systems are smart systems.

For the authors (Weick & Roberts 1993; see also Tsoukas 1996) the individual contributions and the collective mind which they enact are mutually constituted. A contribution helps enact the collective mind to the extent to which it is heedfully interrelated with the imagined requirements of other contributing actors in a situation of joint action (or business operations TK). Thus, the collective mind is an emergent joint accomplishment rather than an already defined representation of any one individual or actor. The collective mind is constituted as individual contributions become more heedfully interrelated in time. Being an emergent phenomenon, the collective mind is known in its entirety to no one, although portions of it are known differentially to all. Hence, the collective mind is a distributed system (Weick & Roberts 1993; Tsoukas 1996).

Weick and Roberts do not, however, address the question of how individuals construct their actions, or how does the distributed character of social systems come about? According to Tsoukas (1996, 15), to explore this question one would need to inquire into the nature of practical action, particularly as it occurs in the context of *rule-bound or rule-following social practices*. For example in stock controller's case (ibid.) actions are part of a complex practical activity which involves the intentional use of both language and tools. Looking at his actions over time, we can discern a pattern; there are certain regularities, which indicates that he follows certain rules in carrying out his job. These rules do not just give shape to his actions. They function as normative constraints, namely as criteria by which his behaviour may be guided and assessed. A practitioner engages in a particular discursive practice and this particular practice is what it is by virtue of the background distinctions that are embodied in it. The meaning of those distinctions is established through their use in discourse. Every act of human understanding is based on an unarticulated background of what is taken for granted. The human agent's understanding and knowing resides, first and foremost, in the practice in which he participates; his understanding and knowing how to follow rule is implicitly in the activity in which he engages (Tsoukas 1996, 16).

According to Tsoukas (1996, 17):

(i) All articulated knowledge is based on an unarticulated background, a set of subsidiary particulars which are tacitly integrated by individuals. Those particulars reside in the social practices, our forms of life, into which we

happen to participate. Before we are cognising subjects we are Daseins (beings-in-the-world). An utterance is possible only by the speaker's dwelling in a tacitly accepted background.

(ii) A practitioner's ability to follow rules is grounded on an unarticulated background. Hence the rules an observer is able to postulate in a practice (rules-as-represented) are different from the rules actually operating in the activities of the agents (rules-as-guides-in-practice).

(iii) The unarticulated background in which we dwell is known by us through our having been socialised into it by others. The background understanding that socialisation imparts to us is not only cognitive but also embodied; we acquire particular skills through our bodies to relate in certain ways to the world. Through our socialisation into a practice, we internalise a set of background distinctions which are constitutive of the practice.

But where do those rules come from? Moreover, if rules do make social life patterned and reliable, where does *novelty* come from (Tsoukas 1996, 17)? In fact, social practices can be viewed as consisting of three dimensions (Mouzelis 1995; Tsoukas 1996, 17–18):

- First, the social position or role dimension, that is, the normative expectations that are associated with the carrying out of a particular role. In the case of stock controller (see Tsoukas 1996, 15–16), this would involve the normative expectations held of him by his superiors, his peers, and his associates in other firms.
- Secondly, the dispositional dimension, namely the system of mental patterns of perception, appreciation, and action which has been acquired by an actor via past socialisation. This is Bourdieu's notion of habitus. History leaves its marks on how actors see the world. Every time we act we do so by means of the habits of thinking we acquired through our past sosialisations. At any point in time, our habits of thinking have been historically formed through our participation into historically constituted practices.
- Third, the interactive-situational dimension, that is, the specific context of a social activity (e.g. business operations TK) within which normative expectations and the habitus are activated.

Given that positions and dispositions entail certain types of quasi-automatic behaviour on the part of actors, how are we to account for the *diversity* of actors' behaviour? According to Tsoukas (1996, 19; Mouzelis 1995) the answer lies in the effort agents make to manage to unavoidable *tensions* between social positions (roles), dispositions and interactive situations. First, normative expectations are unlikely to be identical to an actor's habitus, although in the corporation's or group's eyes practices that deviate from the canonical are, by definition, deviant practices (Brown & Duguid 1991, 42). Second, normative expectations and dispositions are activated within particular interactive situations, and how such activation occurs is a local matter. Thus human agency is always and at every moment confronted with specific conditions and choices. Human agent selects out on the other hand what they understand to be the relevant aspects of both their relevant role-related normative expectations and their sets of dispositions, and on the other those relevant aspects of the local conditions within which their actions take place (Tsoukas 1996, 19).

All in all, the main claims Tsoukas (1996, 21–22) suggests are the following:

- The resources a firm uses are neither given, nor discovered, but created. It is not so much the resources per se that are important to a firm as the services rendered by those resources (Penrose 1959). The services depend on how resources are viewed, which is a function of the knowledge applied to them.
- The organisational problem firms face is the utilisation of knowledge which is not, and cannot be, known in its totality by a single mind.
- The firm is a distributed knowledge system. A firm's knowledge is inherently indeterminate. Nobody knows in advance what the knowledge is or need be.
- A firm's knowledge is distributed in an additional sense; it is partly derived from the broader industrial and societal context within which a firm is embedded.
- Normative expectations, dispositions and interactive situations are inevitably in tension. There are always gaps between "canonical practice" and "noncanonical practice" (Brown & Duguid 1991). Those gaps are closed only through practitioners exercising their judgement. They can select out what they take to be the relevant features of each one of the three dimensions making up social practices.

From research point of view, what needs to be explained is according to Tsoukas (ibid., 22) not so much "why firms differ", as what are the processes or mechanisms that make them similar.

The conclusion is that the business of a firm largely depends on its growth and development into a reliable partner and supplier and its active participation in business operations in a wider context of business communities. The development and growth of enterprises and entrepreneurs can be viewed as a "legitimate peripheral participation" (Lave & Wenger 1991). Newcomers are typically innovative enterprises and learning organisations (see Hurst 1995). With the establishment of positions, characters and identities of actors business practices may become "canonical conventions". The renewal of canonical conventions depends on the actors themselves. The actors may also act in a non-canonical, innovative way, creating new conventions.

6. Capability development in industrial and institutional context

In the following we will discuss the special factors and viewpoints that should be taken into account when approaching the development of the know-how and knowledge of enterprises in a mesosystemic and enterprise population context.

Within the evolutionary research program a distinction can be made between two main types of theory, ontogenetic and phylogenetic (Knudsen 1995a; Hodgson 1993). *Ontogenetic* theories are concerned with studying how a single organisation develops during the cource of its existence. *Phylogenetic* theories are concerned with the historical development of a whole species. An example of ontogenetic type of theory is Penrose's (1959) The Theory of the Growth of the Firm. On the other hand, Chandler's (1990) study of the development of new organisational forms is an example of phylogenetic type of theory (Knudsen 1995a).

As has already been noted, the innovation capability of an enterprise refers to a relational concept. It is therefore sensible and highly necessary to approach the factors affecting the development of the innovation capability of an enterprise from a wider (meso)systemic perspective and on the enterprise population level. It is also sensible to perceive individual enterprises as parts of a wider network or chain of actors, population or group of enterprises. For example, many "best practices" models of innovation management typically overlook the fact – which is evident from the population perspective – that enterprises are different and that the competitiveness of an enterprise is based on its special know-how. Furthermore, many institutionalised conventions, conceptions and norms and expectations that have become customary in the business world are connected to this wider context of business activities. From the mesosystemic and population point of view the key considerations and factors concerning the development of the company´s innovation capability are the following:

1. Enterprises are different and their innovative capabilities must be developed from enterprise-specific starting points.
2. Enterprises are embedded in a wider social, cultural and functional context (Granovetter 1985).

3. Leadership plays a central role in creating distinctions between enterprises (Knudsen 1995a, 1995b). Business know-how does not result from "natural selection" based on the environment and market mechanisms. The deterministic model of thought must be rejected as erroneous (see also Child 1972, 1997; Whittington 1988) if we want to understand the factors and mechanisms affecting the orientation and development of the innovation capability of an enterprise. The internal selection environment of an enterprise, i.e., its internal decision-making and selection processes, are equally important for the development of its innovation capability as the external environment.

6.1 Firms are essentially heterogenous

The firm of neoclassic theory is characterized as being an entity without any history since changes in its productive knowledge are entirely the result of exogenous shifts in its production function. Moreover, neoclassic theory views firms within the same industry as *identical* because they possess knowledge of the same production techniques (Knudsen 1995b, 203). Evolutionary theory conceptualizes the firm as a bundle of routines containing and passing on rather *idiosyncratic knowledge* about how various activities should be performed. Firms are seen as having developed *different capabilities* and will thus be perceived as having *different identities* (ibid.).

By stressing the *heterogeneity* rather than homogeneity of the firm's productive services (Penrose 1959), it becomes possible to understand the firm and a competitive advantage in a way far more adequate to the field of strategic management (Knudsen 1995b, 207). Neoclassical theory assumes that all firms within an industry have access to the same "cookbook" of recipes and are subject to identical cost and demand conditions. However, the neoclassical theory has difficulties in explaining why some firms have competitive advantage over their competitors. Viewed from Penrose's growth perspective, heterogeneity among firms – and hence the ability of certain firms to gain sustained competitive advantages over other firms within the same industry – could be explained by the fact that each individual firm, through its life cycle, accumulated very *idiosyncratic knowledge* (ibid.).

Since firms are heterogeneous, there is no single correct model, method or "best practice" for management, or innovation management (cf. Patton 2001; Christensen & Raynor 2003). Best practices are specific to the firm, situation and context.[8]

As Lawson and Samson (2001; see also Tidd 1997; Tidd et al. 1997) state, there is *no one* generic formula of innovation capacity. Innovation capacity can proposed in the first place as a higher-order integration capability, that is, the ability to mould and manage multiple capabilities. An innovation capability can defined as the ability to continuously transform knowledge and ideas into new products, processes and systems for the benefit of the firm and its stakeholders.

Evolutionary theories typically approach the differentiation of firms *diachronically*, as a historical and chronologically evolving process. In other words, evolutionary theories typically depart from the hypothesis that the differentiation of firms and economic actors results from cumulation of knowledge and know-how over time. Austrian economics complements and expands this view by adding a *synchronic* perspective that stresses the uneven and asymmetrical distribution of knowledge.

For example, Shane (2000; see also Eckhardt & Shane 2003) focuses on entrepreneurs and the question of the recognition of new business opportunities. Shane (ibid.) departs from the Austrian economics and the idea of the distribution of information between many different actors.

As Shane (ibid.) notes, *before* technological change leads to new processes, products, markets, or ways of organising, entrepreneurs must *discover opportunities* in which to exploit the new technology. Because opportunities do not appear in a prepackaged form, this process of opportunity identification is essential. In any given new technology, entrepreneurs could fail to identify any opportunities, or could identify the wrong opportunities, making an explanation

[8] In their article Christensen and Raynor (2003) discuss how management theories can lead business leaders down destructive paths. They point to companies that divided into multiple business units on the advice of management consultants who touted decentralization and autonomy. They note that at Lucent Technologies, the decision to decentralize proved disastrous since effective product development required the integration of various development groups around a unified product strategy. Only by re-centralizing has Lucent been able to restore some of its former market strength.

for the discovery of opportunities an important part of the domain of entrepreneurship research (Shane 2000, 448).

Most research on entrepreneurship investigates the entrepreneurial process *after opportunities have been discovered* (ibid.). Researchers typically adopt this approach because they draw on neoclassical economic or psychological theories that assume people will discover the same opportunities in a given technological change, or discover opportunities that are uncorrelated with the attributes of the discoverers. Austrian economics challenge the validity of these assumptions, arguing that *different people* will discover *different opportunities* in a given technological change because they possess different prior knowledge. According to the Austrian argument the discovery of entrepreneurial opportunities depends, in the first place, on the *distribution of information* in society (Shane 2000, 448–449).

Neoclassical equilibrium theories of entrepreneurship assume that 1) everyone can recognise all entrepreneurial opportunities, and 2) fundamental attributes of people, rather than information about opportunities, determine who becomes an entrepreneur (Shane 2000). Whereas Austrian economics assume that equilibrium theories fail to offer a satisfying theoretical framework for understanding market process. They assume that a viable theory of a market system cannot assume equilibrium conditions but must explain how a market would achieve that equilibrium *from nonequilibrium initial conditions*. The Austrians assume that markets are composed of people who possess different information (Hayek 1945). The possession of idiosyncratic information allows people to see particular opportunities that others cannot see, even if they are not actively searching for such opportunities.

Given that information asymmetry is necessary for entrepreneurial opportunities to exist, everyone in society must not be equally likely to recognise all opportunities and, respectively, all individuals are not equally likely to recognise a given opportunity (Shane 2000, 451).

Moreover, before an individual can earn an entrepreneurial profit from opportunity, he or she must discover that it has value. Two alternative explanations exist for this discovery processes: *search* and *recognition* (ibid.). Austrian economists argue that people do not search for entrepreneurial opportunities because opportunity, by definition, is *unknown until discovered*

and one cannot search for something that one does not know exists. This argument leads to the proposition that people can and will discover entrepreneurial opportunities without actively searching for them (ibid.).

Each person's idiosyncratic prior knowledge creates a "knowledge corridor" that allows him/her to recognise *certain* opportunities, but not others (Shane 2000, 452). Prior information, whether developed from work experience, education, and via several learning mechanisms, influences the entrepreneur's ability to comprehend, extrapolate, interpret, and apply new information in ways that those lacking that prior information or experience cannot replicate. Therefore, even if information about a technological change is disseminated broadly, only some subset of the population will possess prior information that will trigger the discovery of a particular entrepreneurial opportunity. Three major dimensions of prior knowledge are particularly important to the process of entrepreneurial discovery (Shane, ibid.): prior knowledge of markets, prior knowledge of ways to serve markets, and prior knowledge of customer problems. Grounding on above arguments, Shane (ibid.) suggests the following proprositions:

- People's prior knowledge about markets will influence their discovery of *which markets to enter to exploit a new technology.*
- People's prior knowledge about *how to serve markets* will influence their discovery *of how to use a new technology* to serve a market.
- People's prior knowledge *of customer problems* will influence their discovery *of products and services* to exploit a new technology.

6.2 Embeddedness of economic operations

Despite its important insights, the resource-based view has not looked beyond the properties of resources and resource markets to explain *enduring* firm heterogeneity and *sustainable* competitive advantage. In particular is has not examined the social context within which resource selection decisions are embedded and how this context might affect sustainable firm differences (Oliver 1997).

Embeddedness refers in the first place to the fact that economic actions and outcomes, like all social action and outcomes, are affected by actors' dyadic

relations and especially by the structure of the overall network of relations. Social influences are not simply conceived of as frictional drags. Rather, they are also seen as contextual factors that support economic behaviour (Grabher 1993).

In embeddedness theories (as an overview see Dacin et al. 1999) the structural, social, cultural and cognitive context of economic action is brought in. Instead of taking the internal capabilities as the focus of analysis, emphasis is placed on formal and informal patterns of economic action that are collectively shared and agreed upon. Much of embeddedness research seeks to demonstrate that economic action is embedded in larger and complex social process. While embeddedness can regarded as a constraint, the strategic implications also involve the creation of distinctive sets. So, it is important to consider the duality or paradoxical nature (Uzzi 1997) of embeddedness in addressing its implications for strategy and practical action (Dacin et al. 1999). According to Uzzi (1997) the same process, by which embeddedness creates a requisite fit with the current environment, ca paradoxically reduce an organisation's ability to adapt or innovate.

In his classical essay on embeddedness Granovetter (1985) contrasts "undersocialised" (classical and neoclassical economics) and "oversocialised" (sociology, Parsons) conceptions of economic action. According to Granovetter (ibid., 485) despite the apparent contrast between under- and oversocialised views, both have in common a conception of action and decision carried out by *atomised actors*. In the undersocialised account, atomisation results from narrow utilitarian pursuit of self-interest; in the oversocialised one, from the fact that behavioural patterns have been internalised and ongoing social relations thus have only peripheral affects on behaviour. That the internalised rules of behaviour are social in origin does not differentiate this argument decisively from a utilitarian one, in which the source of utility functions is left open, leaving room for behaviour guided entirely by consensually determined norms an values. Under- and oversocialised resolutions of the problem of order thus merge in their atomisation of actors from immediate social context (ibid.).

According to Granovetter (1985, 487), a fruitful analysis of economic action requires us to avoid the atomization implicit in the theoretical extremes of under- and oversocialised conceptions. Actors do not behave or decide as atoms outside the social context, nor do they adhere slavishly to a script written for them by the

particular intersection of social categories that they happen to occupy. Their attempts at purposive action are instead embedded in concrete, ongoing systems of social relations.

It is the merit of the so-called national innovation systems approach (see for example Lundvall 1992; Nelson 1993) to have point to the fact that companies, although they are the developers of new products and services, very seldom innovate in isolation (DeBresson 1999). In pursuit of technical, organisational or managerial innovations they interact with other organisations to gain, developed and exchange various kinds of information, knowledge and other resources. The concept of an innovation system takes into account that due to the intensive exchange of knowledge, information and other resources, it often makes no sense to regard innovative firms as isolated individual decision-makers. Instead, it becomes useful to analyse firms embedded in a network of economic actors (Schienstock 1999).

Companies not only interact with other organisations, but are also embedded in an institutional environment together with them (ibid.). The function of an institution is to regulate the relationships between people and groups of people within as well as between and outside the organisations. Institutions reduce uncertainty and provide with information, institutions regulate conflicts and co-operation and provide incentives.

As Hodgson (1988, 205) states, in a world of uncertainty, rules, norms and institutions play a functional role in providing a basis for decision-making, expectation and belief. Without these "rigidities", without social routine and habit to reproduce them and without institutionally conditioned conceptual frameworks, an uncertain world would present a chaos of sense data in which it would be impossible for the agent to make sensible decisions an to act.

In brief, path and context dependency on the other hand allows for adaptive learning (Schienstock 1999). Companies undertake technological and organisational changes to be able to fully exploit to productivity and innovation potential of the existing trajectory. However, path and context dependency can also lead to so-called "lock-ins" (Grabher 1993). According to Grabher (ibid.) a distinctions can be made between a structural, a political and a cognitive lock-in. In the case of the decline of the Ruhr, Grabher (1993, 262) illuminates the

phenomena of cognitive lock-in as follows. Within the coal, iron, and steel complex a specific world view was developed on the basis of social reinforcement. This world view determined which phenomena were perceived and which phenomena were ignored. Then, when events and signals were perceived, the world view determined how they had to be interpreted. This world view referred to the long-term development of demand for the main product of the Ruhr: steel. Particularly on account of the long-term continuity in demand trends, the slumps in the early 1970s were at first interpreted as breaks in a growth path that was stable in the long run. In other words, the sharp downturns in demand were interpreted as a phase in a business cycle, not as the beginning of long-term decline. This unchallenged groupthink interpretation prevented a reorganisation of the regional economy in an early period of decline, when the region was still well equipped with resources for innovation. Intensive relations limited the perception of innovation opportunities and left no room for "bridging relationships", those that transcend a firm's own narrowly circumscribed group and bring together information from different sources.

As Edquist and Johnson (1997, 59) state, organisations are strongly influenced, colored, and shaped by institutions. Organisations can be said to be embedded in an institutional environment or set of rules. But institutions are also embedded in organisations, which may be seen as concrete host or even source for specific institutions. Moreover, the overall architecture of an inter-firm network (structural, relational and cognitive embeddedness, Figure 3) is partly shaped by the each member firm's entrepreneurial needs, which themselves are driven by *intra*-organisational sensemaking (Simsek et al. 2003). In other words, just as the inter-*firm* network influences (potentially) each member firm's entrepreneurial behaviours, so too does each member firm's entrepreneurial behaviour influence (potentially) the network. At the core of this thesis is the recognition that within every firm resides a network of decision makers. These can be seen as intra-firm sensemaking communities that are nested within the inter-firm sensemaking community (ibid.). While sensemaking occurs at both levels, the contexts for sensemaking are different.

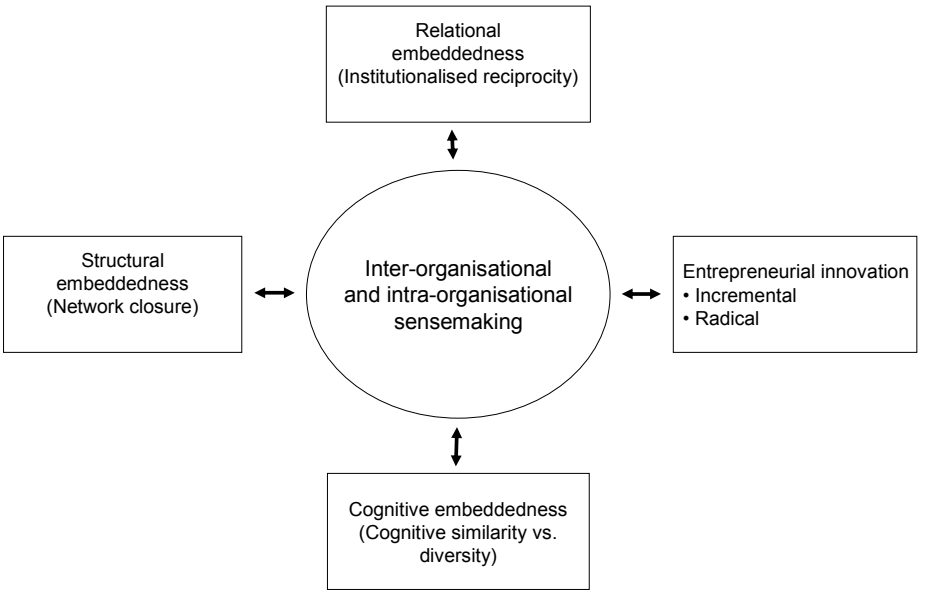

Figure 3. Embeddedness and innovation (see Simsek et al. 2003).

Enterprises and organisations are not isolated entities. They are members in a broader population of enterprises, each of which is using the others as a reference point for their own strategising and sensemaking activities (Porac & Thomas 2002). In addition, these different levels and processes of sensemaking can be seen developing as a *co-evolutionary* process (Simsek et al. 2003; Lewin & Volberda 1999; Van den Bosch et al. 1999). Co-evolution processes exist as complex systems of continual and reciprocal interactions, where one condition influences and is influenced by another. Thus, co-evolutionary processes do not lend themselves to simple linear progressions or to directional relationships, but instead to recursive relationships among variables within the system.

Thus, the paradox of sustainable competitive advantage can be formulated as follows (Oliver 1997, 700):

- From the institutional and contextual point of view firms' tendencies toward conformity with predominant norms, traditions, and social influences in their internal and external environments lead to *homogeneity* among firms in their structures and activities; successful firms are those that gain support and legitimacy by conforming social pressures.

- In contrast, from the internal, resource- or competence-based view, rare, specialised, inimitable resources and knowledge-bases and resource market imperfections cause firm *heterogeneity*; successful firma are those that acquire and maintain valuable *idiosyncratic* resources and knowledge-bases for sustainable competitive advantage.

6.3 Agency and innovation

Schumpeter discerned, among other things, the paradox of innovation (Rammert 2000). He called the double dynamics of innovation as a process of "creative destruction". The innovative actions of daring entrepreneurs produce the dynamics of capitalism. The protestant principle of timesaving and the methods of rational work organisation cannot explain its expansion and acceleration sufficiently. Innovation means *creation of new combinations* of methods and machines *and* at the same time *radical devaluation* of produced values, including well-functioning machines, effective production methods, and highly qualified workforce (ibid.). For Schumpeter, to be an entrepreneur was to be an *agent of change*. The defining characteristic of entrepreneur is the doing of new things or the doing of things that are already being done in a new way.

As Knudsen (1995a) notes, the intellectual fields of sociology and economics have traditionally been separated by a deep gulf. For decades, economics has been regarded as almost synonymous with the maximisation principle, emphasising the free choices of agents. In sociology, by contrast, social structures determine to a large extent the behaviour of individuals and limit their freedom of action. Economic models study *agents*, that is, individuals whose main characteristic is their ability to take independent action. Sociological model, on the other hand, study *actors*, that is individuals – like stage actors – are assumed to play certain roles in accordance with the expectations of others in their environment (Knudsen ibid.).

According to Giddens (1984, 9) *agent* refers not to the intentions people have in doing things but to their capability of doing those things in the first place. Agency concerns events of which an individual is the perpetrator, in the sense that the individual could, at any phase in a given sequence of conduct, *have acted differently*. Whatever happened would not have happened if that individual had not intervened.

To be able to "act otherwise" means being able to intervene in the world, or to refrain from such intervention, with the effect of influencing a specific process or state of affairs (Giddens 1984, 14). This presumes that to be an agent is to able to deploy a range of causal powers, including that of influencing those deployed by others. Action depends upon the capability of the individual to "make a difference" to a pre-existing state of affairs or course of events. An agent *ceases to be such* if he or she loses to capability to "make a difference", that is, to exercise some sort of power. According to Giddens (ibid., 15) action logically involves power in the sense of *transformative capacity*.

Giddens' view of agency and structure (structuration) can also be used as a theoretical framework to explore the link between the entrepreneur (as agent) and the context or structure (Jack & Anderson 2002). Giddens' view of structuration deals with the duality of structure and agency. Giddens accords structure a formative position in social action, but also recognises the agents' freedom within the structure, that is a freedom to modify the structure. According to Jack and Anderson (ibid.) embedding mechanisms allows us to link structure and agency in a dynamic relationship. And, in order to understand entrepreneurship, we must take into account of both structure and agency. We can then appreciate how societal influences shape entrepreneurial agency and how agency redefines or develops structure.

Social embeddedness is relevant to entrepreneuship because it, for example, helps the entrepreneur identify social resources, an essential step to founding organisations. Moreover, being embedded within the social context means access to more support during the entrepreneurial process but also a likelihood of increased entrepreneurial activity. However, embeddedness can also act as a constraint. Uzzi (1997, 57–59) explicates some conditions that could turn embeddedness into a liability. For example the unexpected loss of a network's core organisation or a deep and sudden structural change in resource flows can cause embeddedness to shift from an asset to a liability. A contractor may become highly skilled at working with a manufacturer's fabric, production schedule, and design specifications. If that manufacturer closes shop or migrates offshore, then the embedded relationship that originally benefited the contractor may now put it at a higher risk of failure that if it had diversified its ties. On the other hand, overembeddedness can reduce the flow of new or novel information into to network because redundant ties to the same network partners mean that

there are few or no links to outside members who can potentially contribute innovative ideas.

According to structuration theory, in order to enact a social practice, participants must draw on a set of rules (Jack & Anderson 2002). These rules can also be seen to structure and to shape the practices they help organise. Agents draw on rules in the enactment of actions, but the capacity to modify the rule in an ever-present possibility. At each point of structural reproduction, there is also the potential for change.

7. Embedding and disembedding mechanisms

As Mintzberg et al. (1998, 299) have noticed, what distinguished strategic management from other fields in management is its very focus on *strategic choice*: how to find it and where to find it, or else how to create it when it can't be found, and then how to exploit it.

Focussing on strategic choice raises all kinds of interesting questions (Tsoukas & Knudsen 2002, 411): What is choice and how is it explained best? To what extend can it be said that human choices are an expression of free will rather than a deterministic reflection of circumstances? How is thinking related to action? How are choices made at one point in time related to choices made at earlier points in time, and to what do they foreclose choices to be made at later points in time? Are there certain strategic choices that are systematically connected to creating competitive advantage? Do such choices already exist waiting to be discovered, or are they uniquely created? How are corporate coherence and corporate renewal achieved over time?

According to Tsoukas and Knudsen (2002, 411) much of strategic management literature seems to be limited to decision making situations that are relatively stable and repetitive, involving no surprises and few uncertainties (no changes). On the other hand, attempting to conceptualise change processes, some researchers have tended to build models that reduce the element of human agency to a minimum, relying on selection forces rather than human intentionality to design viable organisations and strategies.

Thus, the field of strategic management seems to be confronted with a dilemma: strategy thinkers have either drawn on theories that account for strategic choices but no changes; or they have drawn on theories that account for changes but no strategic choices (Tsoukas & Knudsen 2002, 412).

7.1 Strategic choice

John Child's strategic choice perspective (Child 1972) was originally advanced as a corrective to the view that the way in which organisations are designed and structured is determined by their operational contingencies (Child 1997). This view overlooked the ways in which the leaders of organisations were able in practice to influence organisational forms to suit their own preferences. Strategic choice drew attention to the active role of leading groups who had the power to influence the structures of their organisations through an essentially political process.

The exercise of strategic choice (Child 1972) by organizational decision-makers refers to a process in which the first stage is their evaluation of the organization's position: the expectations placed on it by external resource providers, the trend of relevant external events, the organization's recent performance, how comfortable the decision-makers are with its internal configuration, and so on. A choice of objectives for the organization is assumed to follow on from this evaluation, and to be reflected in the strategic actions decided on. (Child 1997.)

Externally oriented actions may include a move into or out of given markets or areas of activity in order to try and secure a favourable demand or response that will be expressed by a high consumer valuation of the organization's products or services. Internally oriented actions may involve an attempt, within the limits of resource availability and indivisibility, to establish a configuration of personnel, technologies and work organization which is both internally consistent and compatible with the scale and nature of the operations planned. (Child 1997.)

The strategic choice perspective gave some attention to the choice of internal organisation with reference to the contextual parameters of size and technology. It was, however, more fundamentally concerned with the relationship between agency and environment (Child 1997). The three key issues arising from strategic choice analysis concern

- the nature of agency and choice
- the nature of environment
- the nature of relationship between organisational agents and the environment.

Agency and choice

The problem of human agency has had a continuing intellectual significance in the social sciences. It has been regarded as problematic because of the "dismal paradox that human agency becomes human bondage because of the very nature of human agency" (Dawe 1979; Child 1997, 49). That is, human beings have succeeded during the course of their history in creating socially-organised systems which then limit further exercise of human agency, even to the point of determining human action. Such organised constraint acts both upon individuals and organisations. The forms it takes include culture (collective mental programming), institutionalised norms for socially approved action and the constricting bureaucracies of government and big business. Cultural values and institutional norms can become internalised so that they act to constrain choice primarily through the social actor's own interpretative mechanisms rather than through constraints which are ostensibly imposed from outside. (Child 1997.)

Whittington (1988) has developed the distinction between external and internal forms of constraint. The dichotomous approach (voluntarism vs. determinism) tended to ignore the preconditions for exercising agency, and the possibility that actors themselves may not have sufficient capacities for could also be overlooked. This led Whittington to distinguish between "environmental determinism" and "action determinism" (Whittington 1988; Child 1977). Action determinism refers to the possibility that actions are selected according to in-built preference and information processing of the actors. It qualifies the simple assumption that organisational actors can exercise choice once external constraints are removed. Action determinism draws attention to the mechanisms used by actors in deciding what to do. The simple single-mindedness of the actor's internal mechanisms can deny any genuine choice between alternatives (Whittington 1988, 523; Child 1977, 50).

The concept of action determinism draws attention to the relevance of predetermined mind-sets for the interpretative process which takes place when strategic choice in exercised and it account for how these could limit the range of choices recognised and considered. It points to the significance of managerial cognition, and the factors shaping it, for an understanding of the strategic-choice process in organisations (Child 1977).

Strategic choice analysis recognises both a pro-active and a re-active aspect in organisational decision making vis-à-vis the environment (Child 1977). Organisational agents can take external initiative, including the choice to enter and exit environments, and also make adaptive internal arrangements. At the same time, the environment within which they are operating is seen to limit their scope for action because it imposes certain conditions for their organisations to perform well.

Weick (1979) maintains that people in organisations "enact" their environments. This can be interpreted in two ways (Child 1997). The first is that people can only be aware of a literally all-embracing concepts like "the environment" in terms of how they enact it in their minds. Organisational actors therefore necessarily respond to their own subjective definitions of the environment. This interpretation is fundamental to strategic choice analysis and to any view of organisations that admits of human agency (Child 1997, 53). The second interpretation is that people in organisations can enact the environment in the sense of "making it happen as they wish".

Enactment in strategic choice analysis refers mainly to actions which bring certain environments into relevance – which introduce them onto the organisational stage. The possibility of environmental enactment is thus limited to the selection of environments in which to operate, and even this decision cannot necessarily be entered into lightly or frequently since it may incur large entry and exit costs (Child 1997, 53).

7.2 Managerial cognitions and institutionalised expectations

In the tradition of evolutionary economics, much research has focused on how existing technological capabilities, codified in the routines, procedures, and information processing capabilities of the firm, can limit its adaptive intelligence (Tripsas & Gavetti 2000). A firm's prior history may constraints its future behaviour in that learning tends to be premised on local processes of search. When learning needs to be distant, and radically new capabilities need to be developed, firms often fall into competence traps, and core competencies become "core rigidities" (Leonard-Barton 1992).

Strategic management researches are showing increased interest in the knowledge and cognitive structures of managers and decision-makers (Durand et al. 1996). This concern stems from increased recognition of the importance of the underlying assumptions decisions made by managers. These assumptions actually link the economic environment to the strategy of the firm. Selective perception is said to play a critical role in strategic issue diagnosis and problem formulation.

There is a substantial literature on innovation, and while it recognises that cognitive processes play a role, it does so mostly implicitly and has yet to address this issue explicitly. Recent research suggests that cognitive processes are important for example in mediating the outcomes of decisions to adopt technological innovation. The success or failure of technology may depend on the cognitions of the decision-makers who shape the organisations choices about the adoption of innovations (Swan & Newell 1998).

The cognitions of a firm's key actors influences the firm's entrepreneurial behaviours by affecting how the firm identifies environmental opportunities and problems, considers organisational capabilities and constraints, and formulates and implements strategies (Simsek et al. 2003). While most of the theory about cognition's effects on communications pertains to teams within an organisation, it is possible to extend this reasoning to actors within inter-organisational networks. Like reciprocity cognitive embeddedness is a two-sided endowment to the firm, in that it promotes incremental entrepreneurial orientations and outcomes, but inhibits the firm's ability to sustain its viability through radical entrepreneurial behaviour (ibid.).

Cognitive similarities can positively and shared expectations can positively influence the rate of incremental innovation and renewal activities by increasing efficiency of inter-organisational communication and allowing executives across the network to quickly acquire a common definition of the situation (Simsek et al. 2003). By having similar cognitive orientations and expectations, key actors across organisations are more likely to understand each other and more likely to need a minimum of cognitive effort to communicate. Thus, shared cognitions may increase the rate of incremental innovation by permitting communication economies to be realised.

On the other hand, cognitive diversity and differences are necessary for radical innovation (Simsek et al. 2003). Heterogeneity of cognitive content stimulates discussion, decreases groupthink and leads to more original ideas. The diversity of belief structures enhances the search for information, increases the perception that change is feasible, and generates momentum for change. The importance of cognitive diversity is also a central feature in March's (1991) discussion of the exploration/exploitation trade-off, where diversity sustains the capacity for exploration and for avoiding competence traps.

Existing innovation and enterprise research has recognised quite a number of mechanisms related to cognitive embeddedness, which may turn into factors limiting the detection of new kinds of strategic possibilities. They include

- technological trajectories as self-fulfilling prophecies
- path and history dependence
- industrial recipes
- dominant logic.

Technological trajectories as self-fulfilling prophecies

Technological change does show persistent patterns, such as the increasing mechanisation of manual operations, the growing miniaturising of microelectronics, and the increasing speed of computer calculations. Some of these patterns are so precise as to take regular quantitative forms. For example, "Moore's Law" concerning the annual doubling of the number of components on state-of-the-art microchips, formulated in 1964, has held remarkably well from the first planar-process transistor in 1959 to the present day (MacKenzie 1996, 54).

The problem is how such persistent patterns of technological change are to be explained and interpreted. As MacKenzie (ibid., 55) notes, the notion of "natural" trajectory of technology is a ambiguous term in relation to the technological development. The trouble is that "natural" can be seen as something what is produced by, or according to, nature. If I throw a stone, I as human agent give it initial direction. Thereafter its trajectory is influenced by physical forces alone. The notion of "technological trajectory" can thus easily be

taken to mean that once technological change is initially set on a given path its development is then determined by technical forces.

A persistent pattern of technological change does possess momentum, but never momentum of its own. Instead of being a "natural" trajectories can be seen as a *self-fulfilling prophecy* (MacKenzie 1996, 55). Persistent patterns of technological change are persistent in part because technologist and others *believe and expect* that they will be persistent. The mechanism of self-fulfilling prophecy can be exemplified by the persistent increase in the speed of computer calculation (ibid., 56). At any point in time from the mid 1960s to the early 1980s there seems to have been a reasonable consensual estimate of the likely rate of increase in supercomputer speed: that it would, for example, increase by a factor of 10 every five years. Supercomputer designers drew on such estimates to help them judge how fast their next machine had to be in order with those of their competitors, and thus the estimates were important in shaping supercomputer design.

According to MacKenzie (ibid.) the prophecy of a specific rate of increate has been self-fulfilling. It has server as an incentive to technological ambition. In addition, it has also served to limit such ambition. Why did designers satisfice rather than seek to optimise? The specific reasons were risk and cost. By general consensus, the greater the speed goal, the greater the risk of technological failure and the greater the ultimate cost of the machine. Through supercomputer customers are well heeled, there has traditionally been assumed to be a band of "plausible" supercomputer cost. If designers did not moderate their ambitions to take risk and cost into account, their managers and financiers would. The assumed rate of speed helps as a yardstick for what is an appropriately realistic level of ambition.

The nature of the technological trajectory as self-fulfilling prophecy can be expressed in the languages of both economics and sociology (MacKenzie 1996, 57–58). *Expectations* are an irreducible economic aspect of patterns of technological change. Actors' expectations of the technological future are part of what make a particular future, rather than other possible futures, real. And with hindsight, the path actually taken may look natural, indicated by the very nature of the physical world.

The sociological way of expressing essentially the same point is to say that a technological trajectory is an *institution* (ibid.). Like any institution, it is sustained not through any internal logic or through intrinsic superiority to other institutions, but because of the interests that develop in its continuance and the belief that it will continue. Its continuance becomes embedded in actors' frameworks of calculation and routine behaviour, and it continues because it is thus embedded.

Industry recipes

Firms in a particular industry draw upon an "industry recipe", a shared pattern of managerial judgements concerning issues on product, technology, marketing, personnel etc. (Spender 1989; see also Tsoukas 1996; Whitley 1992). An industry recipe is closely tied to the field of experience in which it is generated and enables managers to make sense of their particular environment. A recipe emerges as an unintended consequence of managers need to communicate, because of their uncertainties, by world and example within the industry (Spender 1989, 188).

An industry recipe developed over time within a particular industry context. A recipe consists of a set of background distinctions tied to a particular field of experience (Tsoukas 1996). The distinctions pertain to a number of issues which managers in a firm must grasp if they are to "get things under control" (Spender 1989, 181, 191–192). Managers form networks that extend well beyond their own organisations to include similar managers in other organisations. Despite being competitors, managers, as members of a network of practice, have extensive shared practice leading to extensive shared know how (Brown & Duguid 2001).

Through a process of socialisation, managers internalise industry-specific distinctions. Managers are introduced into a universe of meanings which is not related to their firm-specific roles as such, but pertains to the broader industrial field within which their roles are carried out (Tsoukas 1996). The recipe is learned within the context of discursive practices. It forms the unarticulated background which underlies managers' representations of their firms. It is the "tacit knowledge" that enables managers to construct some order in a hostile environment.

Industry recipes can, however, become embedded to the extent of *inhibiting an innovative response* to changing competitive conditions (Child 1997, 50). In other words, the basic beliefs, or mind set, of the strategic actor tend towards stability, and this inhibits the making of strategic choices which are adaptive to new circumstances. Behaviour of this kind corresponds to what Dutton (1993) terms "unreflective or automatic strategic issue diagnosis".

Dominant logic

Over time, successful recipes – business models, processes and approaches to competition – are embedded in the organisation and represent the "dominant logic" (Prahalad & Bettis 1986; Bettis & Prahalad 1995; Prahalad 2004). A dominant logic limits the ability of people in the organisation to drive innovation or see new opportunities and threats. In stable competitive environments, the dominant logic helps sustain organisations and strategy because it is internally consistent. If the competitive environment is subject to rapid changes, however, the blinders of dominant logic make it hard to recognise new threats and opportunities (Prahalad 2004).

According to Prahalad (2004) the dominant logic of company is the DNA of the organisation. It reflects how managers are socialised. It manifests itself often, in an implicit theory of competition and value creation. It is embedded in standard operating procedures, shaping not only how the members of the organisation act but how they think. Because it is the source of the company's past success, it becomes *the lens* through which managers see all emerging opportunities.

Organisations are complex systems, where individual behaviours of managers and employees interact in complex ways with each other and with the environment of the organisation. Within any system various properties emerge that are not a simple property of the constituent agents. Emergent properties of organisations include political coalitions, values, informal structure, and suboptimisation. The dominant logic is another emergent property of organisation (Bettis & Prahald 1995, 10–11). The dominant logic is actually emergent property of complex organisations seeking to adapt. It provides a set of heuristics that simplify and speed decision making. This inherently results in "adaptive ability", so long as changes in the underlying logic are not necessary. It allows the organisation to anticipate the environment. However, this adaptive

ability has limitations and carries with it harmful side effects. The organisation anticipates that the environment will be very similar to the current and past environment, not necessary the actual future environment.

The dominant logic puts actually constraints on the ability of the organisation to learn. The dominant logic functions as an information filter (Bettis & Prahalad 1995, 7). Organisational attention is focused only on data or information considered relevant by the dominant logic. Other information and other aspects are largely ignorant. Relevant data are filtered by the dominant logic and by the analytic procedures managers use to aid strategy development. These "filtered" data are then incorporated into the strategy, systems, values, expectations, and reinforced behaviour of the organisation.

According to Bettis and Prahalad (ibid., 7–8), the dominant logic can be viewed as a fundamental aspect of organisational intelligence. And an organisation's intelligence is the ability of the organisation to learn, whereas organisational learning can be thought of as occurring at the level of the strategy, systems, values, expectations and reinforces behaviours, which then shape the dominant logic through feedback. This is not a simple case of oneway causality, but involves a feedback loop that ties the traditional variables to the dominant logic in an interactive fashion. In other words the two are mutually interdependent.

The concept of organisational learning has often been mathematically embodied in the learning curve. It is assumed that the learning curve is drawn on "a clean sheet of paper" in that learning takes place in a neutral context. This is seldom if ever the case (Bettis & Prahalad 1995, 9–10). There is often previous learning "drawn" on the paper that may inhibit the new learning process. This leads to the concept of unlearning (Argyris & Schön 1978; Hedberg 1981). According to Bettis and Prahalad (ibid.) the dominant logic makes clear that before strategic learning can occur, the old logic must be unlearned by the organisation. Viewed in this fashion the focus shifts from learning to unlearning in the case of strategic change.

8. Dynamic capabilities

After all, what would be the most useful framework for analysing and developing innovation capability of the firm? Tidd et al. (1997, 57, 69) conclude that the most useful framework so far is the one developed by Teece et al. (1997). It gives central importance to the dynamic capabilities of firms, and distinguishes three elements of corporate innovation strategy: competitive and national positions, technological paths, and organisational and managerial processes.

As Teece et al. (1997, 515) note, the global competitive battles in high-technology industries such as semiconductors, information services, and software have demonstrated the need for an expanded paradigm to understand how competitive advantage is achieved. Winners in the global marketplace have been firms that can demonstrate timely responsiveness and rapid and flexible product innovation, coupled with the management capability to effectively coordinate and redeploy internal and external competences.

Teece et al. (ibid.) refer to this ability to achieve new forms of competitive advantage as "dynamic capabilities" to emphasize two key aspects that were not the main focus of attention in previous strategy perspectives. The term "*dynamic*" refers to the capacity to renew competences so as to achieve congruence with the changing business environment (ibid.). Certain innovative responses are required when time-to-market and timing are critical, the rate of technological change is rapid, and the nature of future competition and markets difficult to determine. The term "*capabilities*" emphasizes the key role of strategic management in appropriate adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to mach the requirements of a changing environment.

According to Teece et al. (1997, 518) the competitive advantage of firms lies with its managerial and organizational processes, shaped by its (specific) asset position, and the paths available to it. *Managerial and organizational processes* refer to the way things are done in the firm, or what might be referred to as its routines, or patterns of current practice and learning. "Processes" are conceptualised as a hybrid-dimension (Schreyögg & Kliesch 2005): On the other hand, processes are devoted to coordinating and integrating available resources. This is understood as the static component. On the other hand, processes refer to

organisational learning and reconfiguration of resources. The dynamic sub-dimension "learning" covers processes of incremental improvements as well as processes of identifying new opportunities – from both an organisational and an inter-organisational perspective. The second dynamic sub-dimension "reconfiguration" addresses the complete transformation of the firm's asset structure. It covers the surveillance of the environment for discontinuities and the accomplishment of corresponding radical changes.

The essence of competences and capabilities is embedded in organisational processes. But the content of these processes and the opportunities they afford for developing competitive advantage at any point of time are shaped significantly by the assets the firm possesses and by the evolutionary path it has adopted or inherited (Teece et al. 1997, 518).

Position refers to firm's current specific endowments of technology, intellectual property, complementary assets, customer base, and its external relations with suppliers and complementors. The internal position relates to the specific set of resources available in a firm. The external side refers to the specific market position or assets of the focal firm. The current positions of a firm determine to a certain extent the future decisions a firm can reach and realise.

Paths refer to the strategic alternatives available to the firm, and the presence or absence of increasing returns and attendant path dependencies. Path represents the history of an organisation. That is, the current position of a firm is basically shaped by the patterns evolved from the past. In addition, where a firm can go in the future depends on its current paths and their shaping force.

The capabilities approach sees value augmenting strategic change as being difficult and costly. Moreover, it can generally only occur incrementally. Capabilities cannot easily be bought; they must be built. From the capabilities perspective, strategy involves choosing among and committing to long-term paths or trajectories of competence development (Teece et al. 1997, 529).

The concept of dynamic capabilities – problems and contradictions

The concept of dynamic capabilities proposed by Teece et al. (ibid.) tries to integrate many approaches and thus circumvent many drawbacks of

conventional approaches. But it has also been noted to contain many problems and contradictions:

- The concept of dynamic capability does not explain or help us understand the origin of dynamic capabilities, or what ultimately produces them (Zollo & Winter 2002).
- The concept of dynamic capability can be considered a contentually tautological concept (Priem & Butler 2001; Barney 2001; Vos 2002). As Priem and Butler (2001) argue, the dynamic capabilities view is undermined by the tautology that "competitive advantage is defined in terms of value and rarity, and the resource characteristics argued to lead to competitive advantage are value and rarity".[9]
- Dynamic capability theory is based on inside-out perspective. The creation of competence is believed to take place mainly within organisation. From a socio-cognitive perspective, however, competence of firms and networks are observed to be embedded in shared beliefs about both how things are and how things should be done, and in social representations which manifest these beliefs (Stein 1997).
- In the construction proposed by Teece et al. the operational and management processes of an enterprise have no concrete contents. Therefore it fails to provide any contentual view of strategic development potentials. If resources or capabilities are defined in terms of what they *do* rather than what they *are*, it becomes impossible to distinguish among them the strategic and the non-strategic resources. The resource-based view offers a perspective on organizations; it does *not offer strategic insights per se* (Nanda 1996).
- The idea of the position or path dependence of an enterprise can be interpreted in many ways. For example, the current position of an enterprise in a certain value chain or as part of the value chain can be perceived as a fact that limits and "determines" its business opportunities. On the other hand, in the future the enterprise may "position" itself in a strategically new way. On the other hand, technological dependencies or "trajections" should

[9] Tautological ground-figure underlying strategic decision-making is actually an *empirical fact*. The problem is that the resource-based and dynamic capabilities view neglect this and therefore fail to grasp the specifics of the way members of organisations deal with strategic issues (Vos 2002, 22).

not be understood as natural laws. They are rather expectations related to technological development that can be seen as self-fulfilling predictions (see MacKenzie 1992, 1996). An important source of significant innovations may be that someone is able to think in a way that contradicts prevailing expectations and models of thought. A typical example of such thinking is the development of personal computers.

If the purpose is to develop the innovation capability of an enterprise, capabilities or the lack of them should be approached from a "symmetric" real-time perspective. Symmetry means that both weaknesses and strengths, that is, core competences and core rigidities (Leonard-Barton 1992) should be given equal weight. Core competences or capabilities are characterised in almost exclusive affirmative way. Even if the perils of path dependence and core rigidity are acknowledged to some extent, the flip side of core competences is not really reflected in the well-established concepts (Koch 2004)[10]. However, for the development of the innovation capability it is essential to be able to identify critical problems related to resources, know-how and the development of innovation capability (cf. Dodgson & Bessant 1996), path dependences and possible "lock ins" restricting innovation capability (see Grabher 1993; Schienstock 1999).

As Koch (2004) states, there is certainly ways out of the competence trap, but the first and necessary step out of a lock-in competence is to develop a critical perspective on it, including the concern of path breaking abilities. However, the most part of the literature seems to neglect this problem by following the idea of meta-competence in terms of dynamic capabilities. Concerning the problem of core rigidities it is quasi self-evident, that the idea of dynamic capabilities has emerged as a solution of this problem of a potential dark side of core competencies. But taken the problem of path dependence seriously, the notion of a dynamic capability does not entail a solution but it embodies only a further step for neglecting that problem (Koch 2004).

According to Leonard-Barton's (1992; 1995) empirical studies, core capabilities turned out to have a dual nature: an up side and a dysfunctional flip side as well.

[10] Pinch and Bijker (1987, p. 22) have noted the asymmetry of technology studies. Most research focuses on analysing successful innovation processes. There is hardly any researched information on failures of innovation.

On the other hand, core competencies facilitated the development of projects and enabled product innovation. Paradoxically, exactly the same competencies inhibited on the other hand further product innovation. Actually, they became "core rigidities". Given the dual nature of organisational competence, managers thus face a paradox (Leonard-Barton 1992; Schreyögg & Kliesch 2005): On the other hand the evolvement of complex and reliable linking patterns constitutes the generation and development of sustainable competitive advantage. At the same time, this reliability implies rigidity and the potential erosion of this advantage. As a consequence, organisations are faced with the dilemma: On the one side utilising and maintaining their competencies and on the other side being damaged by the dysfunctional flip side of exactly these competencies.

As Schreyögg and Kliesch (2005) notice, the problem of the dysfunctional flip side of organisational competence and suggested solutions feature prominently in the recent competence literature. The central idea is *dynamising* competencies/capabilities.

The core idea of dynamising competences is to expand the competence-construct by including learning and transformation processes (Schreyögg & Kliesch 2005). The new dynamic features are added to the dimensions of patterned replication of organisational problem solving in order to ensure that they are made or become flexible. The guiding logic seems to be the following (ibid.): The classical pattern-based essence of organisational competence builds the core, that is, reliable patterns and routines are accepted as the basis of competence. The additional dynamic dimension is designed to overcome the inherent risk of becoming rigid, it aims at appropriate and timely adaptation.

Teece et al. (1997) seek to exploit the positive effects of patterned competences and overcome concurrently its inherent problematic side by adding a dynamic dimensions that ensures change. They actually suggest "re-programming" organisational competence as a two-dimensional notion being both a stable and a learning construct (Schreyögg & Kliesch 2005).

As Schreyögg and Kliesch (2005, 17–18) remark, this solution seems too easy a way out of the dilemma. It builds on two contradictory logics at the same time. Reliable replication and permanent change can hardly mix. Dynamising in the defined sense effectively means transforming reliable and routinised action

patterns into learning operations. Stable patterns are thus thought to become subject to permanent change. Reliable and replicable patterns cannot evolve without stability. They cannot become effective in terms of a pure learning mode. Making them subject to the learning mode actually means dissolving their replicable essence. So it becomes obvious that the idea of adding the learning function to the competence concept runs into a serious problem. It is not possible to simply add the missing learning feature. The two dimensions are contradictory in nature. To stress the one dimension necessarily means dissolving the other.

As a conclusion Schreyögg and Kliesch (ibid.) state that the idea of building an *integrated* conceptualisation of competence by relying simultaneously on replication and the learning function cannot work. The paradox of competence can not be solved in this way. The integration logic is actually overstretched.[11]

Teece et al. (1997, 523) actually stress that learning is local and close to previous activities. So the scope of learning is constrained by the past and by historical paths. Authors also point to economic reasons for limiting changes. These arguments easily lead to the fostering of small scale, incremental changes only. Path driven learning and transformations are likely only to modify the established way or method of patterned problem solving and to favour incremental changes. By implication, the basic assumptions and values underlying the predominant competence pattern are not called into question and a fundamental change or renewal of the existing competence cannot occur. But in most cases, exactly this fundamental transformation is claimed to be the most important function of dynamic capabilities (Schreyögg & Kliesch 2005, 18).

Since an *integrated* solution seems to bring about unsolvable contradictions and, on the other hand, dynamising seems to be imperative, Schreyögg and Kliesch (2005, 25) suggest to look for solutions that conceive of (i) organisational competences (patterned and routinised problem solving activities) and (ii) organisational dynamising as two *separate* functions to be fulfilled in managing successfully a social system.

[11] Schreyögg and Kliesch (2005) separate two distinctive approaches: "integrative approach" (Teece et al. 1997) and "contingency approach" (Eisenhardt & Martin 2000). According them, neither the integrative not the contingency approach provide a compelling solution to the paradox of organisational competence.

In a nutshell, the basic idea is risk compensation. The solution that Schreyögg and Kliesch (ibid.) suggest is to exploit the power of patterned problem-solving and, on the other hand to compensate for its inherent risk of dysfunctional flip side by alert surveillance and indicating change necessities. Instead of dynamising the competence conception, competence evolvement and system adaptation (strategic innovation TK) are conceived as two separate countervailing processes which are simultaneously performed.

The proposed approach favours a strategy of separating the functions (exploitation/exploration) and treating them as rival forces. Such an endeavour requires shifting the perspective *from the competence* (process) perspective *to the systems level* (Schreyögg & Kliesch 2005, 25–26). In a systems view, competence building and dynamising can be treated as two separate functions an organisation has to fulfil (Luhmann 1995). They can be conceived of as countervailing processes which jointly ensure a proper balance between exploitation and exploration/change. At the heart of successful management is the balanced duality of patterned selection (competence development) and risk compensation (dynamisation).

The compensation process means in the first place *monitoring the system's competencies*, its evolvement, its usage, its effects inside and outside the organisation, as well as critical issues and surprises (Schreyögg & Kliesch 2005, 26–27). By becoming aware of those critical signals the issue of potential change requirements is put on the agenda. This system has to make a decision as to whether or not the approved problem solving patterns should be abandoned.

The monitoring changes the internal status of competencies (ibid.); they become an explicit issue. In other words, monitoring adds a reflexive mode to the operational mode. Within the organisation, monitoring establishes the task of self-observation. The organisation has to observe itself and the functionalities of competencies respectively. The monitoring process looks at the practice of competence (operating level) from alienated point of view. In terms of second order cybernetics (Von Foerster 1981), the reflection represents a second-order observation.

Any practice is possible to understand as an observation, to be precise as a first-order observation. As Schreyögg and Kliesch (ibid., 27–28) note, the suggested monitoring of system's competencies can conceived as a second-order

observation, i.e. an observation of first-order observers or practitioners. Organisational competence is a practice-bound category. In first-order observing processes distinctions are drawn without being aware of how these distinctions are drawn. Drawing operational distinctions is the "blind spot" of any first order observer. This blind spot can be seen only by second-order observing processes. By asking how the distinction is drawn, second-order observing reflects on the first-order practice.

The suggested conception of competence-monitoring represents hence a dual-model of managing the dysfunctional flip side of organisational competencies (Schreyögg & Kliesch 2005, 34). The model contains two levels. On the other hand, there is an operational level with activities or operations based on established competencies which are incrementally developed. On the other hand there is a complementary observation process which is designed to accompany the competence based operations in order to address the issue emerging from their inherent tendency to turn effectiveness into rigidity – or established patterns of action into innovative solutions.

While Schreyögg and Kliesch argue (p. 34) that monitoring of competencies should be seen as distributed activity across the entire organisation, monitoring competencies is also possible to see as distributed or joint activity between focal organisation and facilitating external organisation. As Bessant and Rush (1995) note, especially smaller and less experienced organisations will at some point need to look to external sources for inputs to the process of competence renewing. And it is among other the diagnostic role which consultants or external change agents may play in helping users observe, articulate and define their particular needs in innovation.

Many firms lack the experience, resources and competencies to understand and prioritise their problems in such way that internal and external resources and opportunities can be identified and effectively utilised. Consultants – or other knowledge-intensive business service organisations (den Hertog 2000) – can provide a valuable input to the first stage of innovation by creating as strategic framework for change. They can also move from identifying needs to suggesting means whereby the identified problems can be solved (Bessant & Rush 1995).

9. Reflecting of strategic realities

The theme of this publication is the development of the innovation capability of enterprises. We have already noted that especially in the case of established enterprises we are dealing with an activity that is internally path-dependent and externally context-bound in that it follows the "recipes", rules and operational theories of the branch and is thus conformist and non-innovative. Next we need to ask if the systematic "research-assisted" development of the innovation capability of enterprises is possible in the first place. On what preconditions is the systematic cooperative development of the innovation capability of enterprises possible? What kinds of methods of development and empirical research are possible and make sense in the development of the strategic innovation capability of an enterprise?

Besides being history- and context-bound, it should also be borne in mind that the operation of enterprises is also internally *self-regulated*. In actual fact, it is self-regulated, self-replicating and self-monitoring activity based on internal imparting of meanings and decisions. In the physical sense, enterprises can be considered "open systems" engaged in interactive exchange with the environment through monetary and goods processes. By contrast, the decision-making system of an enterprise can be characterised as a meaning-transmitting, autopoietic, self-maintaining system. At a certain point of time, the result of an enterprise may be of a given size, but the enterprise itself decides whether it is a "good" or a "poor" result. Autopoietic systems are closed and open systems (see e.g. von Krogh & Roos 1996). Closedness is a precondition for openness and communication with the environment (Luhmann 1995).

Correspondingly, the development of the strategic innovation capability of an enterprise ultimately involves internal redefinition and "reprogramming" of the decision-making premises of a self-regulated and self-reproduced system based on reflexive observation and decision-making (communication). More precisely, we are dealing with rule- and path-breaking decisions and operations based on the reflexive observation of the decision-makers of an enterprise (Lassleben 2002). Moreover, in the case of a self-regulated system, an outsider cannot even tell in advance what kinds of "paths" or rules an enterprise is following at any given point of time (Lassleben 2002, 125). Similarly, an outsider cannot tell in advance what kinds of reforms or innovations could be underway in a given

company. An external "change agent" can actually influence the operation and decision-making of an enterprise only by causing perturbation (Luhmann 1995). Theoretical and methodological solutions and the chosen approach largely dictate whether the outcomes of the produced perturbations are ultimately negative or positive.

In the following, the issue of methodological decisions is approached both in the context of (i) the enterprise, practical activities and strategic decision-making, i.e., "first-order observation", and in that of (ii) research and development work, i.e., "second-order observation". The problem formulation departs from the basic premise that the self-referential, autopoietic and paradoxical nature of organisations, enterprises and practical operations in general must be taken seriously in research and development. Most of the final section of the publication presents the solutions proposed by Jan-Peter Vos (2002; 2005). The key conclusion of the publication is that the solutions and models developed by Jan-Peter Vos also offer an applicable and viable basis for the development of the strategic innovation capability of enterprises.

From a perspective of practice, strategy of the company presents two distinct and paradoxical faces (Hendry & Seidl 2003). On one hand, strategies serve to structure, organise and give meaning to the complex operations of business. They determine what is produced, where is sold and how it is marked, how resources are paid for and how they are allocated. They provide stability and direction, and help firms to cope with the uncertainties of the business environment. They shape the routines and discursive structures of an organisation and they are in turn shaped by these; strategies are recursive reproduced by the very practices they produce. On the other hand, discourses of strategy and the role-definitions of strategists are concerned with change. Strategy, for practitioners as well as academics, is explicitly concerned with the future, and with how this might differ from the present: with what "should be" rather than with what is.

Most prescriptive text on strategic planning presume that triggering change is simply a matter of environmental scanning, analysis, and then paying heed to often subtle signals of significant threats or opportunities (Mezias et al. 2001, 75). However, this vies ignores the fact that *what* is monitored and *how* the information collected is *interpreted* are determined by the organisation's

experience-based collective mental models of *how it interacts with its environment*. Some of these, like industry recipes (Spender 1989), may be widely shared in its industry. If these mental models no longer adequately map the strategic environment, the result may be serious errors of judgement.

In addition, as Tsoukas (Tsoukas 2005, 178) notes, a key feature of social practices is their *self-referential character*. Members of social practices interact not with an objectively given environment but rather with perceptions of the "environment". Those perceptions are derived from the way a practice is organised, from the set of cognitive categories, values, and interests by which it is historically constituted. The manner in which the members of a social practice relate to their environment is conditioned by their historically developed appreciative system. They act the way they do because they think the way they do; and they think the way they do because they act the way they do.

Autopoiesis and self-reference

Traditional approaches to organization theory have been dominated by the idea that change originates in the environment (Morgan 1986, 235–236). The organization is typically viewed as an *open system* in constant interaction with its context, *transforming inputs into outputs* as a means of creating the conditions necessary for survival. Changes in the environment are viewed as presenting challenges to which the organization must respond. As Morgan (ibid., 236–240) notes, this basic idea is challenged by the implications of a new approach to systems theory developed by the Humberto Maturana and Francisco Varela. They argue that living systems are characterized by three principal features: autonomy, circularity, and self-reference. These lend them the ability so self-create or self-renew. The term autopoiesis refers to this capacity for self-production through a closed system of relations. Maturana and Varela contend that the aim of such systems is ultimately to produce themselves; their own organization and identity is their most important product. Systems are not, however, completely isolated. Living systems close in on themselves to maintain stable patterns of relations, and it is this process of closure or self-reference that ultimately distinguishes a system as a system.

We have learned to see systems as distinct entities characterised by numerous patterns of interdependence, both internally and in relation to their environment.

Maturana and Varela argue that this is because we insist on understanding these systems from *our* point of view as observers, rather than attempting to understand their *inner logic*. The theory of autopoiesis recognises that systems can be recognised as having environments, but insist that relations with any environment are *internally* determined. These theoretical insights have important implications. For if systems are geared to maintain their own identity, and if relations with the environment are internally determined, then systems can evolve and change only along with self-generated changes in identity (Morgan 1986, 238–239).

The theory of autopoiesis has manifold implications for our understanding of organizations (Morgan 1986, 240):

- It helps us to see that organizations are always attempting to achieve a form of self-referential closure in relation to their environments, enacting their environments as projections of their own identity or self-image.
- It helps us to understand that many of the problems that organizations encounter in dealing with environments are intimately connected with the kind of identity that they try to maintain.
- It helps us to see that explanations of the evolution, change, and development of organizations must give primary attention to the factors that shape an organization's self-identity, and hence its relations with the wider world.

Organisations enact their environments (Weick 1979). The ideas on autopoiesis add to our understanding of this enactment, in that they encourage us to view organisational enactments as part of *self-referential process* through which an organisation attempts to tie down and reproduce its identity (Morgan 1986, 241, emphasis added). What business are we in? Are we in the right business? Questions such as these allow those asking them to make representations or descriptions of themselves, their organisation, and the environment, in a way that helps orient action to create or maintain desirable identity (ibid.). The figures and pictures that an organisation produces on market trends, competitive position, sales forecast, and so forth are really projections of the organisation's own interests and concerns (ibid.).

Organisational identity

The concept of organisational identity has become notable topic in organisation theory. According to Seidl (2003) three fundamental questions underlying this literature: First, what it the unity of organisation, or what holds the organisation together as a *unity*? Second, what distinguishes one organisation from another organisation? The question is one about the *distinctiveness and individuality* of an organisation. Third, how does an organisation perceive itself, or how do the members perceive the organisation? The third question is not about the unity and distinctiveness of the organisation as such, but about the *perception* of it. While the first two questions concern the "substance" of the organisation, the third question is a reflective identity or organisational self-description (Seidl ibid.).

The concept of organisational identity has often been connected to research on sense-making. It was argued that the organisational identity served the members as a lens for their observations. Organisational identity serves as a cognitive scheme for interpreting organisational and environmental events (Seidl 2003, 127).

Organisational self-descriptions basically function as structures, that is, as decidable or undecidable decision premises. Structures in Luhmann's theory have to be understood as providing concrete operations (decisions) with some sort of orientation or guidance. It is possible to distinguish between an operative and an integrative (and transformative TK) function of self-descriptions (Seidl 2003, 135).

9.1 Strategic self-descriptions of enterprises

As already stated in the foregoing, the key conclusion of the publication is that the solutions and models developed by Jan-Peter Vos also offer an applicable and viable basis for the development of the strategic innovation capability of enterprises. They are both theoretically reflexive solutions and solutions applicable to empirical research and practical development work. Methodological solutions have been utilised in Holland mainly in the strategic development of SMEs. The explicit starting point of the development of the methodology by Vos is Niklas Luhmann's theory of social systems (see e.g. Luhmann 1995; Vos 2002, 213–236). Jan-Peter Vos (2002; 2005) departs from

the above-mentioned problem of self-reference of systemic conventions. In brief, the approach developed by Vos deals with the description, observation and analysis of the strategic contents of the activities of enterprises using the theory of autopoietic systems and concepts of strategic management. In the following his approach is discussed in more detail.

Either/or-approaches to strategy

In strategic literature, the problems involved with the observation of the way companies and their environment constitute each other has been neglected for far too long (Vos 2002, 5). The inherent circularity between oneself and one's environment in defining strategies is often obscured by making *either* the environment *or* the capabilities of companies the point of reference in defining successful strategies. However, neither the environment nor organisational capabilities mean something on their own. The environment means only something with respect to the organisational capabilities and organisational capabilities mean only something with the respect to the environment (Vos ibid.). Self-reference implies that contact with the environment is only possible through self-contact, which implies that to know yourself is to know your environment and to know your environment is to know yourself. In other words, you seem to be what your environment is not and your environment seems to be what you are not. This inherent tautological circularity means that self-contact is trapped within chicken-and-egg problem. Besides, in trying to overcome this endless circularity, you stumble in paradox. This is because you try to observe the situation as existing despite of yourself, whereas this situation only exists because of yourself. However, it can be shown that in everyday life we succeed in dealing with such paradoxes continuously. In dealing with self-reference, naively doing something takes primacy above deliberately thinking to go into action. This primacy of doing above thinking has far reaching implications for strategy research. Strategic management is first and foremost understood as a phenomenon for which deliberateness is key and naivety is best avoided. Focussing on self-referential aspects of strategy implies that all strategic reasoning is circular by nature and that, in the first place, spontaneity and naivety instead of deliberateness can offer a way out. By denying the importance of self-reference, either/or -approaches to strategy obscure the empirical fact that

strategic management thrives foremost on meaning instead of reason and that meaning comes into being both deliberately and naively[12] (Vos 2002, 5–6).

Thus, in describing organisations or enterprises strategically, one can take either the *environment* or the *organisation* as starting point (Vos 2005). The former relates to "outside-in" strategies like Porter (1985) and the latter to "inside-out" strategies like the core competence view by Prahalad and Hamel (1990) or the dynamic capabilities view by Teece et al. (1997).

While strategic schools highlight distinct relevant issues to be addressed, they fail to address the fact that strategy is a complex phenomenon that relates to a multidimensional range or direct opposites. Strategy, for instance, is both an emergent and a deliberate phenomenon that involves both the cognitive and communicative aspects of human conduct. Paradoxes are omnipresent. However, denying this paradoxical foundation leads to either/or -approaches to strategy that fail to grasp the specifics of the ways members of organisations deal with strategy (Vos 2002, 21–22).

So, both the "outside-in" and the "inside-out" approaches to strategy do not acknowledge the self-referential problems involved with strategy making (Vos 2005; 2002). Thus, the inherent circularity between oneself and one's environment in defining or creating strategies is obscured by making either the environment or the capabilities of companies the point reference in defining strategies. Vos has (2002; 2005; 2003, 2–4) illustrated how both inside-out and outside-in -approaches are in fact self-defeating by nature. I will refer argumentation of Jan-Peter Vos (ibid.) detailed in the following paragraphs.

According to Porter (1985) sustainable competitive advantage involves dealing with competitive forces within a sector of industry to become distinct from competitors. The competitive forces determine the rules of the game in doing within a sector of industry. Porter states that organisations act wisely if they obey these strategic rules. This implies that within Porter's strategic reality it is not wise if organisations try to change the strategic rules, for that leads to a stuck-in-the-middle position within the sector of industry. The only two ways of becoming distinct are by adopting a "cost leadership" strategy or a "strategy of

[12] Compare the concept of "emergent" strategy.

differentiation". Because Porter assumes the strategic rules within a sector of industry are objective, all competitors will observe the same strategic rules and choose a strategy to become distinct accordingly. Paradoxically, this will result in the situation that strategy no longer concerns doing things differently, but by doing things the same as your competitors do. After all, if either all organisations adopt a strategy of "cost leadership" or "differentiation", the only way to become distinct from competitors is to enact a "stuck-in-the-middle" strategy that, according to Porter, should be avoided at all expense (Vos 2003, 2).

On the other hand Prahalad and Hamel (1990), who disputed the competitive advantage concept of Porter, assume that the existence of core competences of organisations is independent of the markets served by the organisations. This means that a core competence can be applied in diverse independent markets. However, they state (Hamel & Prahalad 1994) that the capabilities of organisations that need to be regarded as core competences eventually needs to be determined by customers. That is, market success determines the core competences of organisations. It appears, paradoxically, that core competences should be regarded as both dependent and independent of the markets served at the same time. This leads to the situation that the "inside out" approach to strategy as recommended by Prahalad and Hamel, ironically, needs to be accompanied by the "outside-in" approach of Porter, which they so fiercely attack, in order to determine an organisation's core competences (Vos 2003, 2–3).

The paradigm of adaptation

Despite the differences between the various schools of strategy research, all schools of thought take *the problem of adaptation* as their starting point (Vos 2002; 2003). All schools of thought relate strategic management to the problem of defining strategies to deal with an environment that is ever changing. The problem of adaptation functions, in fact, as a paradigm for strategy research. The paradigm of adaptation is based upon the assertion that companies constitute their environment in the same way as parts together form a whole. This whole is thought to be relevant for all the companies constituting it and as such determines which strategies need to be regarded as successful and/or unsuccessful. The problem of companies therefore is how to adapt to the environment such that successful strategies result.

Within the paradigm of adaption, organisations are observed as parts of the more encompassing environment (Vos 2003, 4). This implies that organisations trying to observe their environment need to conceptualise their environment as something existing *despite* of their own existence. However, this cannot be the case *because* the environment is nothing else as the sum of it parts and therefore the environment exists only because of the parts constituting it. The paradox is that *the environment exists despite and because of the organisations constituting it at the same time*. The only way to evade this paradox within the paradigm of adaptation is by giving primacy to either environmental or organisational issues and denying the relevance of its counterpart to explain successful strategic conduct. In sum, the blind spot of either/or -approaches relates to the impossibly to conceptualise that organisations and their environment constitute each other reciprocally and that both are equally valid starting points to define strategies (ibid.). Consequently, for social systems approving to the paradigm of adaptation is only possible by disapproving it (Vos 2002, 25–26).

Self-reference and system/environment-distinction

Within the theory of self-referential social systems, each system has its own environment. As Vos (2002, 26) notes, this is a different conception of the system/environment -distinction because within open systems theory, on which the paradigm of adaptation is based, systems and their environment are inclusive, while within self-referential systems theory they are exclusive (Figure 4).

The implication of this new conception of the system/environment -distinction is that systems no longer are part of their environment (Vos, ibid.). Self-referential systems have their own environment and the unity of the distinction between system and environment is regarded as "World". For self-referential systems, "world" relates to ultimate form of complexity they need to deal with in becoming existent. Self-referential systems are autonomous with respect to their environment, which means that the environment cannot influence a self-referential system causally, unless system willingly co-operates. This does not mean that self-referential social systems do not have to deal with their environment. Self-referential systems are autonomous with respect to their environment but at the same time they are forced to deal with their environment. Adaptation towards the environment is only possible by means of self-adaptation.

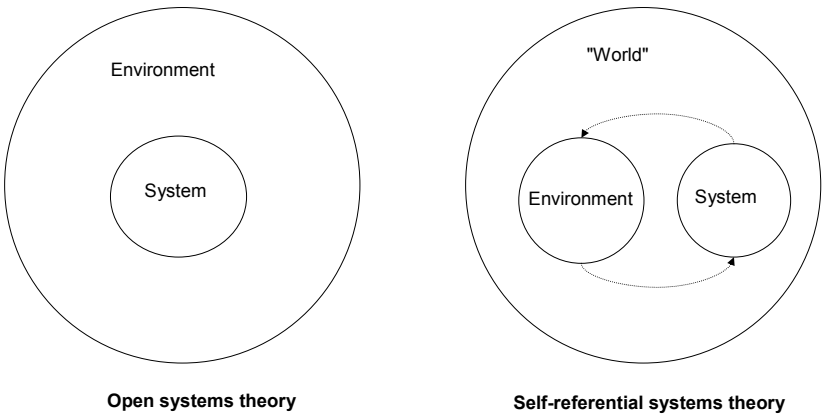

Figure 4. System/environment -distinctions of OST and SST (Vos 2002, 26).

Self-reference, tautology and paradox

The fact that self-referential systems experience their environment exclusive to themselves implies that they can give primacy to neither their environment nor themselves to become existent (Vos 2003, 7). Instead, they need to make sense self-referentially of *both* their environment *and* themselves. Sensemaking involves unfolding or "asymmetrising" the circularity between oneself and one's environment. Thus, strategic sensemaking can be defined as seeking solutions to solve chicken-and-egg problem in making sense of the reciprocal relationship between one's environment and organisation. Dealing with self-reference involves acting naively and as a result, each choice made by these systems to become existent, is contingent because they could have chosen otherwise (Vos 2003, 8).

Once they are operational, self-referential systems may reflect upon their operations and their identity (Vos 2003, 8). When they do this, the system/environment -distinction re-enters into itself. This "re-entry" (Spencer Brown 1972) of the distinction can appear at both sides of the distinction. When the distinction reappears into the system part of the distinction, self-referential systems reflect upon their existence from a "agency" -perspective and the main question is: "What could we be according to ourselves?" On the other hand, when the "structure" perspective is used, the main question is: "What should we be according to our environment?" (Vos 2003, 9.).

Self-reference on three levels of aggregation

The actions of social systems can be viewed on three levels of aggregation: the operational level, the level of processes and the systemic level (Vos 2002, 32). These levels do not relate distinct "ontological" levels; the existence of each level is only dependent on the operations of self-referential systems.

On the *operational level*, self-referential systems are able to create reality by naively or spontaneous commencing in action and asymmetrising the tautology between system and environment in process. The operations of self-referential systems are recursively related to each, which implies that future actions of social systems will be based upon past actions. This implies that something can be regarded as *real* or *unreal* in the future, dependent on what is regarded as *real* and *unreal* in the present past (ibid.).

On the *level of processes*, the self-production of operations (autopoiesis, reality) is dependent on the reproduction of structures or meaning in the sense of what is possible and impossible to regard as real and unreal (ibid.).

On the systemic level, the reproduction of reality and meaning is dependent on the reproduction of the system/environment-distinction in the sense of what is regarded as important and unimportant by self-referential systems with respect to the meaningful constitution of their "World" (ibid.).

Social systems have three types of self-reference at their disposal, i.e. *operational self-reference* on the level of operations, *reflexivity* on the level of processes and *reflection* on the level of systems. Social systems do not need any form of self-referential reflection to become operational and to remain existent throughout time. They only need to start operating and keep on operating. Self-referential reflection, however, is necessary to deal with operational, processional and systemic contradiction.

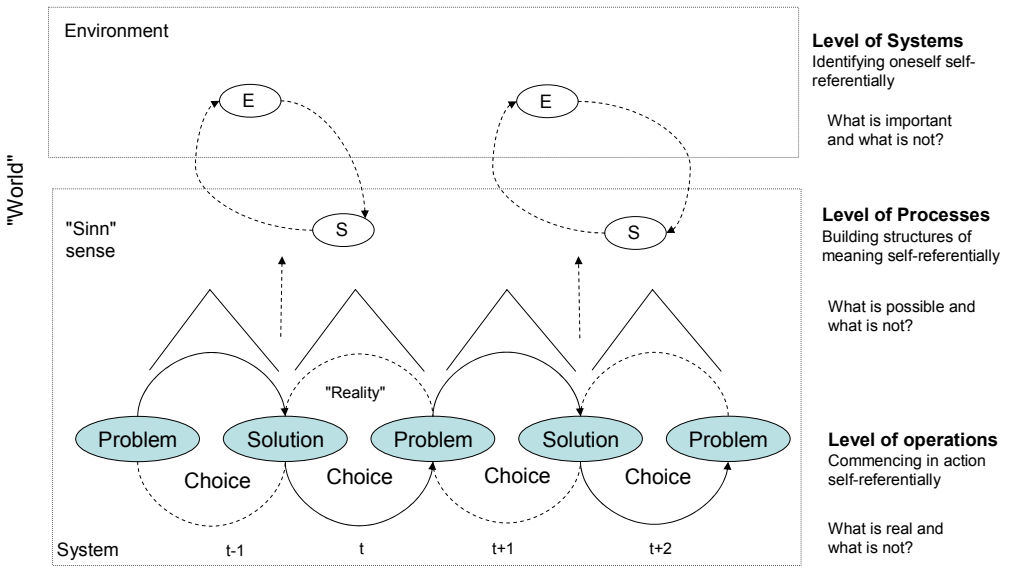

Figure 5. Self-reference on the Level of Operations, Processes and Systems (Vos 2002, 34).

Functional analysis

Functional analysis is the empirical method associated with the theory of self-referential systems. Functional method is aimed at relating specific problems and solutions to each other and tries make understandable and verifiable that problems can be solved *in various ways*. Various alternatives to solve a problem are called *functional equivalent*. Functional analysis can be seen as a means to compare various functional equivalents in solving a problem with each other on their merits (Vos 2002, 35). Functional analysis enables us a framework to address which paradoxical tensions exist, why they exist and how they can be dealt with (ibid., 200).

As a comparative method, functional analysis makes it possible for an observer or social researcher to use distinctions that enable ways of observation, which the social systems under investigation cannot use in the observation of themselves. This implies that social researchers can consider the asymmetries, structures and identities that social systems deem necessary, to enable their self-referential closed operations, processes and systems, as contingent (ibid.).

The point of view offered by the functional method can be used recursively, i.e. problems can also be viewed as solutions and solutions as problems. In the first case, the focus is upon dysfunctional effects of a solution chosen in the past. In the second case, the focus is upon dysfunctional effects of a solution presently in use. The benefits of this methodological stance are that reality does not have to explained tautologically in terms of what it is, but can also be approached paradoxically in terms of what it is *not* (Vos 2002, 35–36).

For an empirical focus on self-reference, two distinct ways of observation can be used (Vos 2002, 36–39). Research aimed at first order observations takes as it point of reference the things that *can* be observed by social systems; observing and "hermeneutic understanding" the way social systems observe or act. Research aimed at second-order observations takes as it point of reference the things that *cannot* be observed by social systems.

The theory of self-referential systems mentions three levels of systemic aggregation: operations, processes and systems. Relating the levels of aggregation and observation to each other leads to useful indications for the kind of knowledge that functional analysis aims at (Vos 2002, 36–37):

- On the *operational level*, social systems need to *assymmetrise* themselves to become existent. For this social systems need to start using "symbolic generalisations" (customers, employees, computers etc.) to create information about these symbolic generalisations, which leads to new and contradictory information. Therefore functional analysis aimed at the first-order observation of operations, relates to observing the way social systems deal with contradictory information about things that constitute reality to find tout what social systems regard as real and what as unreal.
- On the *level of processes*, social systems need to *structure* themselves despite of the instability of their operations to become existent throughout time. For this, social systems need to make selections regarding themes of communication (e.g. strategic management, HRM, operations management) to create expectations about these themes of communication, which may lead to new themes of communication. In addition, recursive process inevitably leads to contradictory expectations. Therefore, functional analysis aimed at the first order observation of processes, relates to observing the

way social systems deal with contradictory expectations about themes of communication that constitute their structures of meaning to find out what social systems regard as possible an impossible to achieve.

– On the *systemic level*, to remain existent, social systems need to *identify* themselves despite of the fact that their identity is unidentifiable. For this, social systems need to start using founding distinctions (profitable/unprofitable etc.) to identify themselves, which may lead to new founding distinctions. This recursive process inevitably leads to contradictory aspects of their identity. Therefore, functional analysis aimed at the first-order observations of systems, relates to observing the way social systems deal with contradictory aspect of their identity to find out what social systems regard as important and unimportant.

Within self-referential systems theory, contradiction provokes social systems to become reflexive (Vos 2002, 37–38). In doing so, social systems stumble upon self-reference. For social researchers second-order observations have to do with explaining or making sense why social systems can only see what they can see and why they fail to see what they cannot see. On the operational level, social systems are challenged to reflect upon their asymmetries in order to deal with operational contradiction. On the level of processes, social systems need to reflect upon their themes of communication in order to deal with processional contradiction, and on the systemic level, social systems need to reflect upon their identity in order to deal with systemic contradiction (Table1).

Table 1. Functional analysis of self-reference (Vos 2002, 40).

	First-Order Observations	Second-Order Observations	Critical Function of Social Inquiry
Operations	Research aimed at observing the way social systems use asymmetries in order to become operational with a focus on operational contradiction	Research aimed at observing the asymmetries used by the social systems as contingent in order to explain (make sense) why the asymmetries were chosen that were chosen	To track down functional equivalents in becoming operational and to evaluate them critically in order to rule out risky and dysfunctional ones
Processes	Research aimed at observing the way social systems use structures in order to become existent throughout time with a focus on structural contradiction	Research aimed at observing the structures used by social systems as contingent in order to explain (make sense) why the structures were chosen that were chosen	To track down functional equivalents in becoming structural existent and to evaluate them critically in order to rule out risky and dysfunctional ones
Systems	Research aimed at observing the way social systems use distinctions in order to become identifiable with a focus on systemic contradiction	Research aimed at observing the distinctions used by social systems as contingent in order to explain (make sense) why the distinctions were chosen that were chosen	To track down functional equivalents in becoming identifiable and to evaluate them critically in order to rule out risky and dysfunctional ones

Self-referential systems thrive primarily on meaning instead of reason to come into existence and remain existent throughout time. Organisational members are forced to deal deliberately with environmental and organisational complexity in order to keep their company existent (Vos 2002, 41). Due to this complexity, they need to address their ability to deal with contradiction on the level of operations, processes and systems (ibid.; Figure 6).

– On the *level of operations*, organisational members can be forced strategically to alter the way they have *asymmetrised* their company's environment and organisation. This implies that organisational members need to be able to reflect

upon the *strategic concepts* in use to make sense of the company's *strategic operations* (e.g. gaining competitive advantage). In dealing with the strategy, members of organisations need to find out what is real and unreal with respect to the strategic problems and solutions they experience in their reality.

– On the *level of processes*, organisational members can be forced strategically to alter the way they have *structured* their expectations regarding the company's environment and organisation. This implies that organisational members need to be able to reflect upon their *strategic routines* (e.g. strategic sessions) in use to make sense of the *strategy process*. In dealing with their strategy, members of organisations need to find out how their "Sinn" enables and constrains them in communicating about what is possible and impossible to achieve strategically.

– On the *systemic level*, organisational members can be forced strategically to alter they way they have *identified* their company's environment and organisation. This implies that organisational members need to be able to reflect upon the *strategic roles* (employer, subcontractor, partners) in use to make sense of the company's *strategic context* (e.g. acquiring new personnel or partners). In dealing with their strategy, members of organisations, need to find out what they regard as important and unimportant in the constitution of their "World".

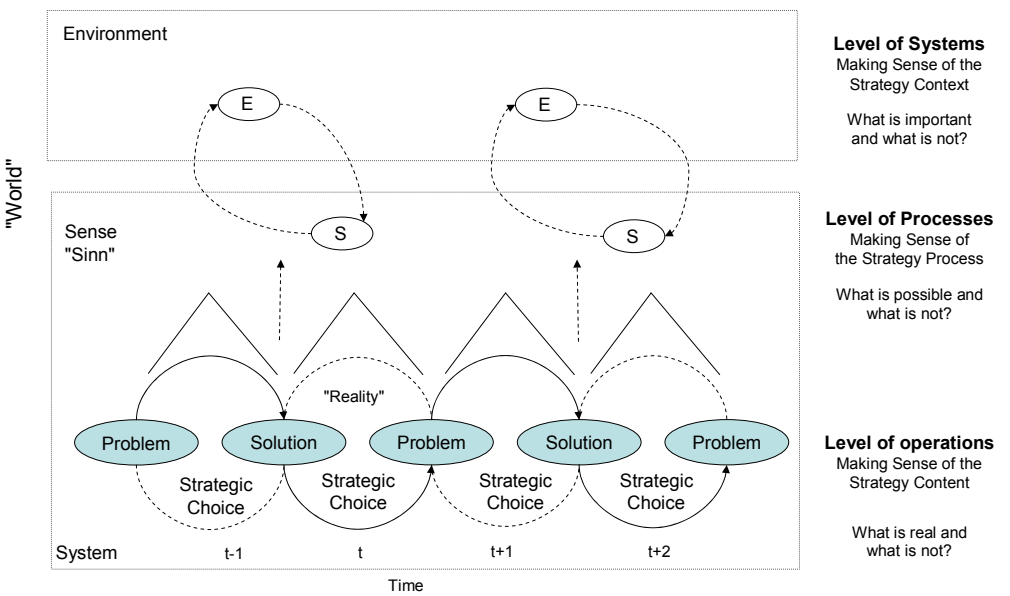

Figure 6. Self-reference and Strategy Content, Process and Context (Vos 2002, 42).

From the stance of organisational researchers, functional analysis makes is possible to use the theory of self-referential systems for empirical research. For a functional analysis of strategy, this means that strategy research could aid in exploring the way organisational members make contingently sense of their company's strategic content, process and context (Pettigrew 1985a, 1987) by means of first-order observations. In addition, the risks involved with the way organisational members "detautologise" and "deparadoxalise" themselves with respect to their company's strategic content, process and context could be identified by means of second-order observations (Vos 2002, 43; see Table 2).

According to Vos (2002, 43) the notions of strategic content, process and context can be used synonymous with the notions of operations, processes and systems as they appear in self-referential systems theory. *Without making sense of strategic content there would be no strategic process and no strategic context*. The functional analysis of strategic sensemaking processes by means of first-order observation is aimed at exploring the way members of organisations give self-referentially meaning to their company's strategic content, process and context – deliberately and naively – to make the company existent and to remain it throughout time. In addition, the functional analysis of strategic sense making processes by means of second-order observation is aimed at observing how companies may jeopardise their existence because of the way they try to remain existent.

Table 2. Both/And-Approach to Strategy (see Vos 2002, 45).

	First-Order Observations	Second-Order Observations	Critical Function of Social Inquiry
Strategic Content	Observing the way *strategic concepts* are used to make sense of the strategy content with a focus on *contradictory information*	Observing the strategic concepts used as contingent in order to explain (make sense) why the strategy content is chosen that was chosen	Tracking down, comparing and evaluating functional equivalents in making sense of strategic content in order to rule out risky and dysfunctional ones
Strategic Process	Observing the way *strategic routines* are used to make sense of strategic processes with a focus on *contradictory expectations*	Observing the strategic routines used as contingent in order to explain (make sense) why the strategy process is structured as it is structured	Tracking down, comparing and evaluating functional equivalents in making sense of strategic processes in order to rule out risky and dysfunctional ones
Strategic Context	Observing the way *strategic roles* are used (defined) to make sense of the strategic context with a focus on *contradictory identities*	Observing the strategic roles used as contingent in order to explain (make sense) why the strategy context is identified as it identified	Tracking down, comparing and evaluating functional equivalents in making sense of strategic context in order to rule out risky and dysfunctional ones

Making sense of strategic content by means of strategic concepts

Sense making in respect to strategic content has been under explored within organisation studies. Most attention has been given to issues involved with the strategy process and context (Vos 2002, 52). Within management literature, the focus is primarily upon the content of strategies in the sense that models are presented that managers should use to define successful strategies. However, these models are not grounded upon knowledge about social mechanisms involved with defining strategies. In addition content of strategies has been explored empirically with respect to mental models of managers (ibid.).

In strategic literature, many strategic management concepts can be found that should aid companies in formulating competitive strategies (in detail see Vos 2002, 44). The use of strategic concepts functions as a two-edged sword for members of organisations because they enable and constrain the strategy process at the same time. They enable sensemaking regarding strategic content because the strategic concepts asymmetrise strategic tautologies. On the other hand, they constrain the sensemaking of strategic content because they prohibit asymmetrising strategic tautologies in other, perhaps strategically more useful ways. The social inquiry is aimed at comparing and evaluating functional equivalents in the way organisational members make sense of the content of their company's strategies. The theoretical relevance of this perspective is to uncover the way organisational members of companies deal with contradictory information regarding strategic concepts in use (first-order observation). In addition, the inability of organisational members to cope with contradictory information regarding to used strategic concepts can be uncovered (second-order observation) (Vos 2002, 45).

Strategic content relates to decisions concerning the use of strategic concepts that aid in making sense of the strategy content (Vos 2003, 15). Strategic content does not refer to the planning of strategies (in traditional sense) but to the concepts used (less or more reflectively TK) within the process. In strategy research literature, many strategic management concepts can be found that should aid organisations in formulating competitive strategies (see Vos 2005, 991–992). From the perspective of social systems theory, it could be said that strategic concepts function as means to become operational. That is, strategic concepts asymmetrise tautologies like that the markets to be served depend on the products offered and the products to be offered depend on the markets served.

The strategic concepts and choices found in strategic literature can be linked to each other in the following way (Vos 2005, 992) (Figure 7). The strategic management model centres on the on the six strategic choices and connects the strategic concepts to each other.

– The choice to connect the strategic concepts of demand (market) and supply (products, services, solutions) to each is the business choice, which relates to the way companies choose to do business while planning to sell their goods or services to customers.

- The choice to connect the strategic concept of added value to the unity of supply and demand, i.e. a business, is called the vision choice, which relates to the way companies choose to make their business appealing while planning to sell their goods or services to customers.
- To choice to connect the strategic concept of competitive move to the unity of an added value and a business, i.e. a vision, is called the tactics choice, which relates to the way companies choose to make their visions come true while planning to sell their goods or services to customers.
- The choice to connect the strategic concept of capability to the unity of a competitive move and a vision, i.e. a tactic, is called the competence choice, which relates to the knowledge and skills companies ought necessary to make their tactics succeed while planning to realise their goods or services.
- The choice to connect the strategic concept of investment to the unity of a capability and a tactic, i.e. a competence, is called the assets choice, which relates to the resources companies choose to actualise their competences while planning to realise their goods or services.
- The choice to connect the strategic concept of operations to the unity of an investment and a competence, i.e. an asset, is called the performance choice, which relates to the way companies choose to deploy and manage their assets while planning to realise their goods or services.

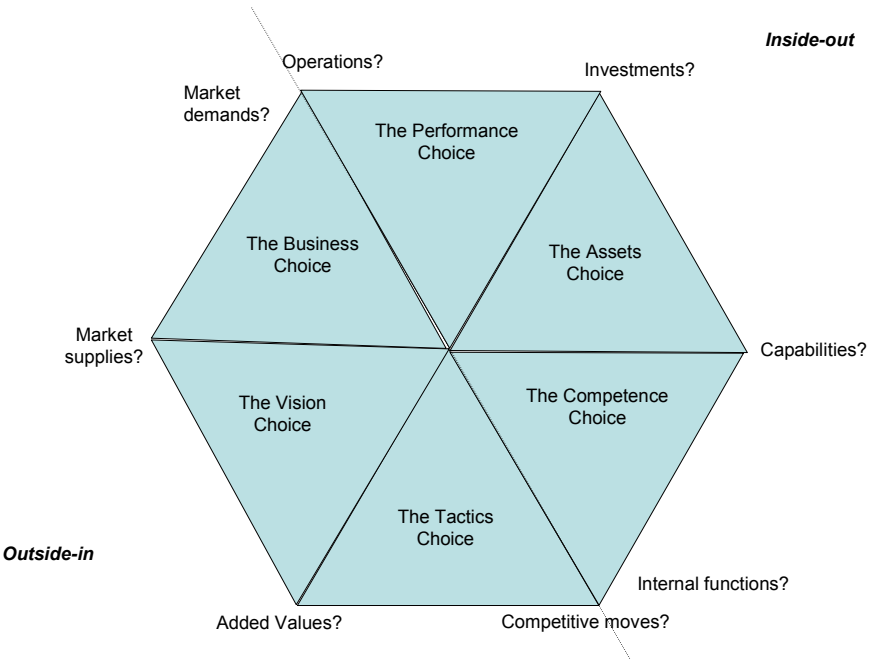

Figure 7. Strategic management model (Vos 2005, 992).

Within the strategic management model, the environment of companies is represent by the business, vision and tactics choice and the organisation of companies by the competence, assets and performance choice. In order to move the outside to the inside, the competitive moves (tactics choice) need to be linked relatively to the responsible internal functions (competence choice). Likewise, in order to move from the inside to the outside, the operations (performance choice) need to be linked relatively to their businesses (business choice). By means of both links, the intermediary is able to confront the management of SMEs with the question to what extend the company is able to do business with its customers as planned (outside-in) and to what extend is the company able to develop the competences it planned by the competitive moves it enacts.

10. Summary and conclusions

The tasks and goals of the research reported here has been to outline the theoretical and methodological guidelines for the development of the innovation capability of enterprises, primarily on the basis of existing innovation research and theories of strategic development of companies.

The research focuses on the question of the theoretical and methodological basis on which it is possible and sensible to approach and analyse the potentials and limitations of innovation and the development of the innovation capability – in the specific context of communities of practice and situated action and decision-making. What kind of basic theoretical assumptions, basic concepts and methodological solutions are possible and sensible as a starting point in analysing the potentials and limitations of innovation and the development of innovation capability in the specific context of practical activities and decision-making?

These problems inherently contain the idea that the development of the innovation capability of an enterprise can be perceived as a process of transformation and change or a process like learning by expanding. The idea of the development of innovation capability also comes relatively close to the view of Pettigrew and Whipp on the management of strategic change. This, again, is closely linked to the notion that the strategic views, ways of thinking (concepts, cognitions, mental models, intentions) and decisions of company management play a central role in the carrying out of strategic innovation and change processes.

There is no ready-made, self-evident, integrating, systemic approach or theory to serve and direct the development of the innovation capability of enterprises. For this very reason, it was necessary to set, define and construct the subject, problem and context of research rather from the point of view of practice and cooperative inquiry – critically assessing, utilising and applying existing innovation research and the theory and strategic management concepts of the enterprise.

The key starting points of research are following. First, innovation activities and development of the innovation capability of enterprises are not necessarily a priori a self-evident and inherently valuable goal. Underlying this notion is the finding that the consequences of an innovation activity and innovation may also be harmful or destructive. The development of the innovation capability of an

enterprise – and innovation activity as a rule – is a contradictory, paradoxical and hence a discursive process. Schumpeter once discerned the paradox of innovation. He called the double dynamics of innovation as a process of "creative destruction". Innovation means creation of new combinations of methods and machines and at the same time radical devaluation of produced values.

Second, what, at any point of time, a social practice is depends on how human agents interpret it to be. And different interpretations constitute different realities. In other words, actors in enterprises and the management itself may have their own theories of the reform and innovation of products, services and processes. Representatives of enterprises also have their own views on the innovation capability of the enterprise, as well as the needs and challenges for its development – including the idea that no such development needs actually exist. The views of the active actors play a central and fundamental role as regards practical activities and decision-making.

Third, practical decision-making and activity are linked to a wider network and context consisting of many specialised actors and decision-makers. Practitioners and decision-makers are connected to a world, enterprise population and context of a certain sector that are distributed and multicentered in terms of the division of labour. Organisation is not a strategically isolated entity. It is one element in a broader population of organisations, each of which is using the others as a reference point for their own strategising and sense making activities.

The development of the innovation capability of an enterprise refers here to collaborative joint efforts and "productive inquiry and development" (Dewey) of the firm's innovation capability between researchers and the firm's representatives. Research and development work builds on the reflexive intervention methodology and heuristic principles. This leads us to the question of how the development of a firm's innovation capability can be perceived so that it makes sense. This, again, requires specific insight into "innovation capability", the "enterprise" as well as the mechanisms affecting the innovation capability of enterprises.

The innovation capability of an enterprise or enterprises has to do with systemic ability (inability) arising from the combined effect of many factors. The innovation capability of an enterprise is by nature a relational concept: in fact it

refers to the communicative relation between the enterprise and the environment; the innovation capability of an enterprise is realised in the form of new kinds of offerings, products, services and delivery contents. As a relational concept, the innovation capability of an enterprise also refers to its specific know-how and its distinctness from other actors and competitors in the same field. Strategic innovation could occur when a company identifies gaps in the industry positioning map and decides to fill them. Gaps refers to 1) new, emerging customer segments that other comspetitors have neglected; 2) new, emerging customer needs or existing customer needs not served well by other competitors; and 3) new ways of producing, delivering, or distributing existing or new products or services to existing or new customer segments.

How the innovation capability of an enterprise is expected to develop? This requires special insight into both the enterprise and factors and mechanisms affecting the development of its innovation capability.

In Chapter six we specified the view of the enterprise used to steer research and development work. The conclusion of the Chapter is that the business of a firm largely depends on its growth and development into a reliable partner and supplier and its active participation in business operations in a wider context of business communities. The development and growth of enterprises and entrepreneurs can be viewed as a "legitimate peripheral participation". Newcomers are typically innovative enterprises and learning organisations. With the establishment of positions, characters and identities of actors business practices may become "canonical conventions". The renewal of canonical conventions depends on the actors themselves. The actors may also act in a non-canonical, innovative way, creating new conventions.

In the following Chapter we analysed the special factors and viewpoints that should be taken into account when approaching the development of the know-how and knowledge of enterprises in a mesosystemic and enterprise population context. The innovation capability of an enterprise refers to a relational concept. It is therefore sensible and highly necessary to approach the factors affecting the development of the innovation capability of an enterprise from a wider (meso)systemic perspective and on the enterprise population level. It is also sensible to perceive individual enterprises as parts of a wider network or chain of actors, population or group of enterprises. For example, many "best practices"

models of innovation management typically overlook the fact – which is evident from the population perspective – that enterprises are different and that the competitiveness of an enterprise is based on its special know-how. Furthermore, many institutionalised conventions, conceptions and norms and expectations that have become customary in the business world are connected to this wider context of business activities. From the mesosystemic and population point of view the key considerations and factors concerning the development of the company´s innovation capability are the following. First, enterprises are different and their innovative capabilities must be developed from enterprise-specific starting points. Second, enterprises are embedded in a wider social, cultural and functional context. Third, leadership plays a central role in creating distinctions between enterprises. Business know-how does not result from "natural selection" based on the environment and market mechanisms. The deterministic model of thought must be rejected as erroneous if we want to understand the factors and mechanisms affecting the orientation and development of the innovation capability of an enterprise. The internal selection environment of an enterprise, i.e., its internal decision-making and selection processes, are equally important for the development of its innovation capability as the external environment.

In Chapter eight we endeavoured – still on the level of an enterprise population – to outline the central mechanisms affecting the development of the innovation capability of enterprises. They include technological trajectories as self-fulfilling prophecies, path and history dependence, industrial recipes and dominant logic. Especially in the case of established enterprises we are dealing with an activity that is internally path-dependent and externally context-bound in that it follows the "recipes", rules and operational theories of the branch and is thus conformist and non-innovative.

In Chapter nine we focused on the synthesising approach on the level of an individual enterprise. The starting point of the analysis was the concept of dynamic capabilities. If the purpose is to develop the innovation capability of an enterprise, capabilities or the lack of them should be approached from a "symmetric" real-time perspective. Symmetry means that both weaknesses and strengths, that is, core competences and core rigidities should be given equal weight. For the development of the innovation capability it is essential to be able to identify critical problems related to resources, know-how and the development

of innovation capability, path dependences and possible "lock ins" restricting innovation capability. The central idea is dynamising competencies or capabilities. Since an integrated solution seems to bring about unsolvable contradictions and, on the other hand, dynamising seems to be imperative, we suggest to look for solutions that conceive of organisational competences (patterned and routinised problem solving activities) and organisational dynamising as two separate functions to be fulfilled in managing successfully a social system. In a nutshell, the basic idea is risk compensation. The solution is to exploit the power of patterned problem-solving and, on the other hand to compensate for its inherent risk of dysfunctional flip side by alert surveillance and indicating change necessities. Instead of dynamising the competence conception, competence evolvement and strategic innovation (or strategising) are conceived as two separate countervailing processes which are simultaneously performed.

In Chapter ten we specified the central methodological choices concerning the research and collaborative development work with enterprises. In Chapter ten, the issue of methodological decisions is approached both in the context of (i) the enterprise, practical activities and strategic decision-making, i.e., "first-order observation", and in that of (ii) research and development work, i.e., "second-order observation". The basic premise is that the self-referential, autopoietic and paradoxical nature of organisations, enterprises and practical operations in general must be taken seriously in research and development. Most of the final section of the publication presents the solutions proposed by Jan-Peter Vos. The key conclusion of the publication is that the solutions and models developed by Jan-Peter Vos also offer an applicable and viable basis for the development of the strategic innovation capability of enterprises.

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Developing strategic innovation capability of enterprises
Theoretical and methodological outlines of intervention

Abstract

The research focuses on the question of the theoretical and methodological basis on which it is possible and sensible to approach and analyse the potentials and limitations of innovation and the development of the innovation capability – in the specific context of communities of practice and situated action and decision-making. What kind of basic theoretical assumptions, basic concepts and methodological solutions are possible and sensible as a starting point in analysing the potentials and limitations of innovation and the development of innovation capability in the specific context of practical activities and decision-making?

There is no ready-made, self-evident, integrating, systemic approach or theory to serve and direct the development of the innovation capability of enterprises. For this very reason, it was necessary to set, define and construct the subject, problem and context of research rather from the point of view of practice and cooperative inquiry – critically assessing, utilising and applying existing innovation research and the theory and strategic management concepts of the enterprise.

Innovation activities and development of the innovation capability of enterprises are not necessarily a priori a self-evident and inherently valuable goal. Underlying this notion is the finding that the consequences of an innovation activity and innovation may also be harmful or destructive. The development of the innovation capability of an enterprise – and innovation activity as a rule – is a contradictory, paradoxical and hence a discursive process. Schumpeter once discerned the paradox of innovation. He called the double dynamics of innovation as a process of "creative destruction". Innovation means creation of new combinations of methods and machines and at the same time radical devaluation of produced values.

What, at any point of time, a social practice is depends on how human agents interpret it to be. And different interpretations constitute different realities. In other words, actors in enterprises and the management itself may have their own theories of the reform and innovation of products, services and processes. Representatives of enterprises also have their own views on the innovation capability of the enterprise, as well as the needs and challenges for its development – including the idea that no such development needs actually exist. The views of the active actors play a central and fundamental role as regards practical activities and decision-making.

Practical decision-making and activity are linked to a wider network and context consisting of many specialised actors and decision-makers. Practitioners and decision-makers are connected to a world, enterprise population and context of a certain sector that are distributed and multicentered in terms of the division of labour. Organisation is not a strategically isolated entity. It is one element in a broader population of organisations, each of which is using the others as a reference point for their own strategising and sense making activities.

The development of the innovation capability of an enterprise refers here to collaborative joint efforts and "productive inquiry and development" (Dewey) of the firm's innovation capability between researchers and the firm's representatives. Research and development work builds on the reflexive intervention methodology and heuristic principles. This leads us to the question of how the development of a firm's innovation capability can be perceived so that it makes sense. This, again, requires specific insight into "innovation capability", the "enterprise" as well as the mechanisms affecting the innovation capability of enterprises.

The key conclusion of the publication is that the self-referential, autopoietic and paradoxical nature of organisations, enterprises and practical operations in general must be taken seriously in research and development. The solutions proposed by Jan-Peter Vos are on that remarkably promising. The solutions and models developed by Jan-Peter Vos also offer an applicable and viable basis for the development of the strategic innovation capability of enterprises.

Keywords

companies, research and development, innovations, strategic innovations, small and medium-sized enterprices, SMEs, industry, institutions, innovation policy, globalization

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