Chapter 1
General Introduction

1.1 Introduction

Innovation is often accompanied by problems [e.g. van de Ven 1986; Leonard-Barton 1988/1995; Geerts 1999; Laudon & Laudon 2000/2002; van Stijn 2006]. We will argue that knowledge is a crucial factor in understanding organizational innovation and consequently the typical problems that are related to knowledge in one way or another.

1.2 Introduction to organizational innovation

1.2.1 A balanced view on organizational innovation

Organizational innovation processes are viewed as important [Strambach 2002; Subramanian & Nilakanta 1996; Duh, Chow, & Chen 2006]; some even say that they are crucial for the modern organization in that it enlarges the competitive advantage [e.g. Legge 1992; Wolfe 1994: 405; Nonaka & Takeuchi 1995; Leonard-Barton 1995]. Organizational innovation often involves information technology [Greif and Keller 1990], such as ERP – a standard software package to support decision making [Klaus, Rosemann, & Gable 2000] or other Management Information Systems [Laudon & Laudon 2006].

Although organizational innovation has great potential, a primary focus on the advantages nevertheless has a danger to it; other aspects to this change process and its consequences can easily be overlooked, such as making an investment in time and money, commitment and acknowledging the complexity of the process [e.g. Linton 2002]. Neglecting these aspects can and often does result in an unsuccessful innovation process as the failure rates of innovation processes show [see e.g. Laudon & Laudon 2002; van Stijn 2006]. It has been estimated that an alarming 50 to 75 percent of all implementation processes of organizational innovation, such as the implementation of software tools organization wide, result in some sort of failure [Machrak 1988; Geerts 1999]. Moreover, even when an innovation process is successful, this ironically does not imply that the initial expected benefits of the innovation have been met [Linton 2002].
To illustrate the complex nature of organizational innovation processes we discuss a case, based on an example by Laudon and Laudon [2002, 366-367], which highlights some of the typical issues and problems that are often involved. This case concerns the implementation of a decision support system [DSS] organization wide.

1.2.2 A typical case of organizational innovation failure

During the mid 90s of the last century an American hotel chain had to deal with a strong decrease in their profits. Management decided that introducing a ‘new customer recognition system’ should be able to face this problem. They expected this system to attract more revisiting customers. The system should provide all kinds of helpful information to improve customer service. For instance, revisiting guests would have advantages such as quick check-in and upgrades.

The hotel chain management took this operation seriously, so they called for a meeting with all the hotel chain managers to discuss the implementation of this customer recognition system. However, most managers sent their assistants due to lack of time and other priorities. In doing this, these managers showed that they did not top prioritize the innovation process. Then, the system was designed without input of the business units and the bonus system that was introduced for revising guests had no clear protocol. When the prototype of this system was demonstrated, arguing started about criteria the system had to meet. For instance, no consensus could be reached on when and how the revisiting customers should profit. Furthermore, there had been no communication between marketing and the CEO’s who had different expectations of the system to be developed. Also the communication between middle management and the board was insufficient, which was caused mainly by the high job rotation over the last years.

Pilot studies showed technical problems, which resulted in difficult and time-consuming procedures. By the time the system was ready to be introduced most parties involved felt a disliking to it, resulting in for instance managers who did not want to spend their budget on expensive presents for their customers.

Furthermore, the system was slow and difficult to use. Personnel did not receive any training or even documentation. After six months the system was abandoned. The result of this organizational innovation: no system, a lot of money spent and many frustrated people.
1.2.3 Probable causes of failure

The above example illustrates typical problems that obstruct innovation processes. Innovation processes are often underestimated [managers sending their assistants instead of coming themselves] and it is tempting to focus on the benefits [more customers] while overlooking the path that realizes these benefits, such as the cooperation of all parties involved, before as well as during the innovation process.

Laudon and Laudon [2002: 368] pose a key question to be considered before initiating an innovation process: Does the implementation of information technology within the organization really create an advantage? Answering this question asks for understanding and supervision of the process.

Typical problem fields are design, data, costs and the use of ICT-tools or the DSS itself. Problems vary from immature technical design to incompatibility with operator incentives [Leonard-Barton 1995]. Typical factors of either success or failure of implementation are involvement and influence of users, support and involvement of management, complexity and risks, and supervision of the implementation process [Laudon & Laudon 2002]. In understanding these problems Leonard-Barton [1988] names transferability, organizational complexity, and divisibility as important parameters for the implementation of a technological innovation, such as a software implementation.

To prevent the problems that typically accompany organizational innovation processes from occurring, Fichman and Moses [1999] stress the integration of what is [already existing organizational processes] with what is to come [the software configuration]. They argue that it is important not only to focus on the consistency of the software configuration, but also to make it fit in the organizational processes, structures and of course the company policy. They suggest an incremental implementation strategy.

In sum, innovation processes are complex as there are many different factors and many different parties involved, often with different goals and gains. Therefore, goal and probable gain of the innovation process should be understood and agreed upon, and so should the way to reach that goal. In understanding organizational innovation, the need for implementation research – as part of the innovation process – has been stressed [e.g. Kimberly & Evanisko 1981; Voss 1988; Klein & Sorra 1996]. The next section will elaborate on a knowledge perspective to organizational innovation. We take this perspective to understand the implementation process. The knowledge perspective is often forgotten and
1.3 Understanding organizational innovation from a knowledge perspective

1.3.1 Focus on knowledge in organizations

Over the last decades the focus on knowledge has gained interest in studying organizations [see e.g. Lammers 2003]. Perhaps partly inspired by the words of Francis Bacon over five centuries ago – knowledge is power – combined with increasing technology, around the mid 70s of the last century knowledge management was regarded as a new concern and of central importance to the public administration [see e.g. Henry 1974; Carroll & Henry 1975; Goerl 1975]. But of course the roots of knowledge management and the focus on knowledge can be traced back much further depending on one’s focus.

Today knowledge management [KM] is an established concept within the field of management and organization. An impetus for the literature on knowledge management came with Hedlund [1994]. Organizations increasingly regard knowledge as a factor for generating added value [as is innovation], which resulted in a focus on KM in organizations [e.g. Jorna 2001; Lammers 2003; Gazendam et al. 2005; Jorna 2007]. This focus on knowledge as a factor to optimize profits has led to a great deal of theorizing and research on knowledge in relation to organizational behavior. Lammers [2003] points to a range of approaches in the academic debate on knowledge management from information and library services and information systems and information technology [e.g. Newell & Simon 1972] to organizational learning and learning organizations [e.g. Argyris & Schön 1978; Sehne 1990; Huysman 1996; Argyris 1999], and strategic management [e.g. Nelson & Winter 1982; Cohen & Levinthal 1990]. Knowledge aspects that have been tackled range from the distributed nature of knowledge [put forward by Tsoukas 1996] and knowledge as resource in the firm [put forward by Grant 1996, and Prusak 1997] to knowledge creation and individual versus social knowledge aspects [put forward by Spender 1996]. Majchrzak, Neece and Cooper [2004] condense the focus of KM in capturing, transferring, and reusing knowledge in organizations.

Thus, knowledge is increasingly regarded as a factor to be considered in organization research. It is a crucial factor, not to be overlooked.
1.3.2 A knowledge perspective on organizational innovation

The above indicates that knowledge is considered to be an important factor in organization research. Not surprisingly, this awareness has also reached the research on innovation. For example, Sørensen and Lundh-Snis [2001] focus on the codification process of knowledge in the process of innovation. Cohen and Levinthal [1990] name prior related knowledge within a firm, the absorptive capacity, as the important indicator for the innovative capabilities of an organization. Nonaka and Takeuchi [1995] suggest knowledge creation to be at the heart of innovation processes and also Leonard-Barton [1995] regards knowledge as the main building blocks for sustaining innovation. Glynn [1996] views organizational innovation as fundamentally cognitive and Jorna [2006] even claims knowledge to be the starting point of innovation. On top of this – and probably consequently – both innovation and knowledge share the consideration that they influence competitive advantage [e.g. Nelson & Winter 1982]. Greif and Keller [1990] link the understanding of innovation to knowledge, with a special focus on individuals.

Zooming in on knowledge related studies in innovation literature many of them emphasize the role of knowledge as a constraint to start the innovation process. We acknowledge this. Our interest, however, is in understanding the knowledge dynamics during the innovation process. We want to understand what we assume to be the core of the innovation process itself, namely the changing nature of the knowledge itself.

1.3.3 A multi-actor perspective

The traditional focus of management and organization research either takes the group level as the unit of analysis or the organizational processes and interactions. This main approach in management and organization research becomes particularly clear when we scan the topics discussed in the IEBM Handbook of Organizational Behavior [Sorge & Warner 1997]. Ranging from markets, hierarchies, processes of organizing and strategic choice as theoretical approaches and paradigms to corporate governance, organization culture, leadership, and power, only two of the 48 topics in the IEBM Handbook directly focus on people: human relations and organizational populations. None of the topics take the perspective of the individual. Our perspective on the individual stands in a different tradition.

In studying the innovation process from a knowledge perspective we take a multi-actor approach [see e.g. Gazendam & Jorna 1998], which takes the individual as a
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starting point to study groups, such as organizations but also to study artificial
groups as in AI research [e.g. Helmhout 2006]. Our main consideration to take
this perspective is that individuals have knowledge, not organizations. So, in
studying knowledge within organizations it is crucial to focus on the level of the
individual. This individual perspective on organizations stands in the tradition of
Simon [1947] and March [March & Simon 1958] who studied organizational
behavior with a focus on the individual. In line with Glynn [1996], who
conceptualizes individual and organizational intelligences as being functionally
similar [i.e., as purposeful information processing that enables adaptation to
environmental demands], our focus in studying knowledge in organizational
innovation is on the individual in an organization.

1.3.4 Bridging theory and practice

Another main issue in our study of innovation from a knowledge perspective is to
bridge theory and practice. We want to see how knowledge functions in practice.
The practice will be found in the domain of planning. However, we also want to
focus on a theoretical framework that is solidly founded in both cognitive science
and semiotics. Semiotics provides the foundation to understand the nature of the
constituting elements of knowledge, that is to say representations or signs. In
addition, cognitive science provides a theory of mental processes and processing
and a methodology to conduct empirical research. The combination of cognitive
science and semiotics thus provides the foundation to empirically test our
hypotheses.

1.3.5 The knowledge domain of planning

Choosing the domain of planning to study the relation between knowledge and
innovation suits our purpose in three different ways. First of all, planning is a highly
cognitive activity, which involves a broad range of knowledge. Our aim is to study
the dynamics of knowledge within the whole range. Secondly, the process of
planning has been shown to be an important influence on innovation, especially in
relation to the development of ICT. Among others, Leonard-Barton [1995] points
to problem solving as an important aspect of innovation; problem solving is also a
main activity within planning and supporting this planning with ICT-tools is a
trigger for innovation. And thirdly, in a time frame of more than fifteen years, our
faculty of Economics and Business has developed expertise on planning and
planning support. In 1989, our faculty initiated the DISKUS-project, which stands
for Dynamic Interactive Scheduling and Knowledge Utilization System. This
resulted in a tool called ZKR, which became a commercial product in 1995 and was successful in more than 50 hospitals. The present study will in particular focus on the implementation of ZKR in relation to the knowledge dynamics during organizational innovation.

1.4 General research questions

In theory, innovation is considered a key factor for organizations to survive. In practice, the innovation process is often accompanied by many problems, putting the estimated failure rate at 50 to 75 percent. Knowledge is considered a crucial factor in the innovation process. While literature at this point mainly focuses on why knowledge is a crucial factor, it remains unclear what actually happens to this knowledge. Therefore, this study aims to understand the role of knowledge during the innovation process in terms of knowledge types. To better understand this, we pose a preliminary research question, which we will use as a reference point for our review of relevant literature. In chapter 6 we will sharpen our research questions, based on our literature review, and we will construct a conceptual model to empirically address our research interest.

This study poses the following questions:
1. What happens to the knowledge of individuals during organizational innovation?
2. Which kind of knowledge [content and type] is important during organizational innovation?
3. In what sense does knowledge change?
4. Which factors influence the knowledge dynamics during organizational innovation?

1.5 Outline thesis

To sharpen our focus we start with investigating the three theoretical pillars to this study, namely innovation, knowledge and the task domain of planning [see also figure 1.1]. Chapter 2 discusses the relevant innovation literature to understand the innovation process and its relation to knowledge. We start with
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exploring the concept of innovation in general, and then move to exploring the innovation niche within knowledge management. We conclude the innovation chapter with the positioning of our study in this literature. The second and third theoretical pillars both focus on two aspects of knowledge; whereas the knowledge pillar focuses on knowledge type, the planning pillar focuses on knowledge domain. Chapter 3 then discusses the study of knowledge dynamics in organizations, for which we introduce knowledge related concepts and we discuss the Information Space by Boisot [1995]. Chapter 4 presents our suggestion to bridge theory and practice in studying the relationship between knowledge and innovation, the cognitive-semiotic model. Chapter 5 deals with the knowledge domain of our study, planning. So the chapters 2, 3, 4 and 5 form the theoretical foundation for the present study; these chapters sharpen our research questions to com- pose our conceptual model from which we deduct our hypotheses in chapter 6.

The chapters 7, 8, and 9 focus on the empirical side of this study. Chapter 7 discusses the empirical setting of Bartiméus, a care institution for visually impaired and blind people; we describe the organization in general and in particular the situation at Bartiméus before the innovation. Chapter 8 discusses the methodological issues, such as the subjects involved, research design, method, operationalization of the theoretical concepts and procedure. Chapter 9 analyzes the data through hypotheses testing and secondary analysis. And finally, chapter 10 draws conclusions bridging the research questions to the data analysis; we conclude reflecting on the outcomes of this study and speculating on its implications.

Figure 1.1: Schematic outline of thesis