A Framework for
Knowledge-based Diagnosis and Improvement Planning
# of Business Processes

Research Thesis

Ivan Nikitin

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A Framework for Knowledge-based Diagnosis and Improvement Planning of Business Processes

Ivan Nikitin

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Abstract

The aim of this project is the design and evaluation of a framework for knowledge-based diagnosis and improvement planning of business processes. The outcome is a soundly based framework that can provide additional leverage within organisations. The study starts from identification of a research gap concerning the methods and concepts available for incorporating knowledge processes and newer knowledge-management perspectives into business process improvement initiatives.

The methodology adopted for the evaluation of the framework is an action research approach using a case study method, within an extended form of design-based research for a single case, with added validation phases for increased prospective transferability of results. This leads to a staged approach where, firstly, a tentative initial framework is produced from extant literature; secondly, that initial form is exposed to a critique producing an intermediate version; thirdly, the intermediate framework is implemented in the case study company and further developed, based on the feedback, to give a concluding version. Finally, the concluding framework is validated by a panel of experts. Additionally, by reflecting on experience from the case with other data collected in the study, recommended guidelines for implementation are assembled.

The principle contribution to theory is the bridging of the research gap identified by introducing a new framework that advances the understanding of the link between knowledge management and business process improvement. The study also contributes an extended design-based research methodology by incorporating the single case and validation phases. The contribution to practice is an implementable and effective framework which will help guide knowledge management support in knowledge-intensive organisations. Potential further research directions are suggested.

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List of Acronyms

AR	Action Research
BP	Business Process
BPE	Business Process Environment
BPI	Business Process Improvement
BPM	Business Process Management
BPMN	Business Process Modelling Notation
BPOKM	Business Process Oriented Knowledge Management
CoP	Community of Practice
DBR	Design-Based Research
DEC	Decision-Execution Cycle
DLC	Decision Life Cycle
DLL	Double-Loop Learning
DOKB	Distributed Organisational Knowledge Base
EBoKS	Enablers & Barriers on Knowledge Sharing
FGKM	First Generation Knowledge Management
HR	Human Resources
ICT	Information and Communication Technology
IT	Information Technology
KBBPI	Knowledge-Based Business Process Improvement
KCM	Knowledge Chain Model
KIB	Knowledge-Intensive Business
KIBP	Knowledge-Intensive Business Process
KIBS	Knowledge-Intensive Business Services
KLC	Knowledge Life Cycle
KM	Knowledge Management
KMDL	Knowledge Description Modelling Language
K-Modeller	Knowledge Modeller
KMP	Knowledge Management Process
KMPE	Knowledge Management Process Environment
KP	Knowledge Process

KPE	Knowledge Process Environment
KS	Knowledge Sharing
MC	Management Consultancy
NGKM	New Generation Knowledge Management
OL	Organisational Learning
OODA	Observe Orient Decide Act
PAIR	Productivity Agility Innovation Reputation
QCA	Qualitative Content Analysis
QDA	Qualitative Data Analysis
RBV	Resource-Based View
SECI	Socialisation Externalisation Combination Internalisation
SGKM	Second Generation Knowledge Management

Chapter 1

Introduction

1.1 Background

Having worked for many years as a management consultant for a small consultancy firm in Switzerland, the researcher recognised in his work practice that the required knowledge to execute consultancy assignments was often undocumented, rarely organised in systems, and, at best, only informally shared among consultants. These observations were in contrast to the organisation's aim of keeping knowledge reusable, as well as easily and permanently available and independent of individual employees.

In general, knowledge is widely recognised as an organisational and commercial variable and the value of knowledge for organisational success is well documented. For many theorists (such as Grant, 1996; Spender, 1996; Teece, 2000; Eisenhardt and Santos, 2000), knowledge is the most strategically significant resource of the firm. Companies need to "know what they know" and how they can use their knowledge more effectively to gain or sustain competitive advantage (Carlucci, 2005).

Management consultancies are particularly representative of the so-called KIBs, knowledge-intensive businesses. These typically provide non-physical intangible services as their products, such as specialised expert knowledge, research and development ability, and problem solving. Correspondingly, in management consultancies, knowledge is not only a key production factor but it is also the product they sell.

Given the particular importance of knowledge to them, the ability of KIBs to manage knowledge is seen as a key to their survival in the business environment; consequently, managing knowledge contributes to gaining and sustaining a competitive advantage.

Although managers and consultants at the firm where the researcher worked have always been aware of the value of knowledge and its management, no purposeful systematic and structured approach regarding knowledge management (KM) existed.

The attempts to manage knowledge at this organisation had been limited; for example, a few years before this study, the management of the company tried to utilise ICT (information and communication technology) in the form of implementing Lotus Notes (a content and workflow management system). This sought to document and structure knowledge so as to support the execution of the business processes. However, although Lotus Notes is still in use, it mainly operates as a document management and email system and the wider purpose, using its collaboration functionality, has failed.

Comparable attempts elsewhere regarding the management of knowledge are described in the literature as the “technological perspective of knowledge management” (Ponzi and Koenig, 2002; Snowden, 2002; Firestone and McElroy, 2003; Hong and Staehle 2005; Filos, 2006; Grant and Grant, 2008). This technological perspective emerged as a management topic in the mid-1990s with a focus on computer science and information technology. In this context, the role of technology was, and still is, often to overcome barriers of time or space that otherwise would be limiting factors in effective co-operation. However, in the last decade, this technological perspective has come under some criticism (Filos, 2006; Hong and Staehle, 2005; Ponzi and Koenig, 2002), questioning the success of such attempts to manage knowledge using only an ICT focus.

In the researcher’s consultancy work practice, attempts at technology-oriented knowledge management showed their limitations mainly in the form of a lack of relevance of the provided information - it often did not match the real demands. This was especially true for non-routine, knowledge-intensive and weakly-structured consulting activities. Moreover, information provided by the ICT systems was usually incomplete, sometimes difficult to retrieve, and not interlinked. One can conclude that, despite the attempts at technology-oriented knowledge management, extensive and sophisticated knowledge about how to execute particular consultancy tasks was often still held by individuals at the organisation and not available more widely. In his own activity, the researcher experienced that knowledge was only shared on demand, most often informally, and that the exchange of required knowledge among employees was unsatisfactory for the reasons discussed above.

As a response to the limitations of technology-oriented knowledge management attempts, some researchers in the early 2000's formulated a new generation of thinking and action regarding the management of knowledge. Authors like McElroy (2003), Snowden (2002), Sveiby (2003) and Wiig (2004) developed views of what these "next generations" of knowledge management might be. Proponents of these new generations of KM suggested more holistic approaches to overcome the limitations of the earlier technology-oriented approaches. However, the common aim of the different KM generations and perspectives was to improve the business results of an organisation.

Several researchers argued that the critical link between KM and business results is through business processes (for example, Massey et al., 2001; Kim et al., 2003; Remus and Schub, 2003; Nickols, 2000). Consequently, from this perspective, KM should be focused on the business processes of the organisation (Hall, 2005; Papavassiliou et al., 2003; Kim et al., 2003; Remus and Schub, 2003) and knowledge understood as a resource used in those processes. However, very few approaches to KM have explicitly acknowledged this relation and even fewer approaches have tried to develop a systematic method to integrate KM activities into the business processes (Disterer, 2003).

Reflecting on these theoretical considerations, practice-based discussions between the researcher and his colleagues about their experiences revealed a lack of a model in the organisation which would help guide KM support to improving business results through improvement of business processes.

1.2 Research Problem

In this context, Strohmaier (2005) argues that, due to the emergence of the phenomenon of knowledge-intensive business processes, there is need for integration of the existing research domains of business process management and knowledge management. Furthermore, other authors, e.g. Dalmaris (2006), Strohmaier (2005); and Remus and Schub (2003), argue that, among the traditional business process improvement methodologies, no methodology is found that would explicitly support the improvement of business processes (BPs) through improvement in the way that knowledge is managed. Traditional BP improvement methods were developed with purely economic or engineering objectives in mind, and their applicability to modern knowledge-intense business processes is arguable (Hall, 2005; Dalmaris, 2006). Several authors argue that there is little research aimed at designing systematic ways of incorporating knowledge processes and knowledge considerations into business process improvement efforts (Hall, 2005; Papavassiliou et al., 2003; Kim et al., 2003). Dalmaris (2006) argues that research in this area calls for the design of an improvement framework that is informed by an appropriate theory of knowledge and that aims to act on the knowledge utilised by or contained in the business process.

These statements indicate that there is a material gap in research in this domain and, thus, an opportunity for the development of knowledge-based business process improvement (KBBPI) framework, together with its corresponding evaluation.

1.3 Research Aim and Objectives

Given the above conclusion, this research is concerned with producing such a KBBPI-framework in the light of KM and BP concepts. Thus, the aim of this research is:

To design and evaluate a framework for knowledge-based diagnosis and improvement planning of business processes.

In order to achieve the above aim with this research, the following objectives are appropriate:

1. Rigorously define the research gap in the field of KM and BP.
2. Determine a methodology to address the gap.
3. Apply the methodology for bridging the gap.
4. Evaluate the solution in a practical setting.
5. Recommend guidelines for implementation of the solution.

In fulfilling these objectives, the aim is achieved

Chapter 2

Identifying a Need

The overall aim of this chapter is to confirm (or otherwise) a research gap in the field and validate the proposed project aim set out in Section 1.3. This chapter identifies and discusses relevant themes concerning management consultancies, knowledge-intensive businesses, knowledge-intensive work, knowledge, organisational learning, knowledge management, and process-oriented knowledge management.

Given that the starting point of this research is a practice problem in a management consultancy (see Section 1.1); this literature review starts with investigating management consultancies.

2.1 Management Consultancies

Some authors argue that, in large parts of the literature on management consultancy, there is no clear and widely accepted definition of what the term ‘management consultancy’ actually comprises (Armbrüster and Kipping, 2001). The majority of publications dealing with management consultancy mainly provide different categorisations. For example, the categorisation used by the International Labour Organisation (ILO) distinguishes between different types of service providers, on the basis of size and organisational (in-) dependence (Kubr, 1996), such as large multifunctional consulting firms, small and medium-sized consulting firms, consulting divisions in management institutions and consulting individuals. One problem is that it is doubtful whether all categories can be simply labelled management consultancy. In order to avoid this problem, others chose to approach categorisation in the consulting industry by identifying the actual product sold or the service provided. For example, the market research company, Alpha (Alpha Publications, 1996), suggests a detailed classification of functional services distinguishing, for example, among strategy-, IT-, HR-consultants and so on. From a functional point of view, management consulting can be defined as follows:

> *……….. providing help in any form on the content, process, or structure of a task or series of tasks, where the consultant is not actually responsible for doing the task itself but is helping those who are. (Steele, 1975)*

The Management Consultancies Association adds the task of implementation to consultation activities:

> *Management consultancy is the rendering of independent advice and assistance about management issues. This typically includes identifying and investigating problems and/or opportunities, recommending appropriate action and helping to implement those recommendations.*

(MCA; FEACO, 1999)

The focus of this research is on the management consultancy category; thus, Kubr's (1996) widely accepted definition is relevant for this research. He defines management consultancy as:

> *an independent professional advisory service assisting managers and organisations in achieving organisational purposes and objectives by solving management and business problems, identifying and seeing new opportunities, enhancing learning and implementing changes.*

Kubr's (1996) definition of management consultants as service providers assisting managers and organisations in achieving organisational purposes is interesting for this research because it also contains an element of instruction. The consultant instructs the client and the additional role as counsellor, coach and educator necessitates a focus on the personal relation between consultant and client.

Clients have a broad range of reasons for hiring consultants. Empirical studies identify the main reasons for hiring consultants as insufficient in-house expertise, the need for independent objective advice, and the need for additional resources (Simon and Kumar, 1987; Bowers and Degler, 1999; Easley and Harding, 1999; Sartain, 1998).

Ernst and Kieser (1999) identify political reasons for hiring consultants, such as buffering management decisions against the consequences of failure or to stimulate acceptance of such decisions. Kubr (1996) classifies these reasons in the form of five principal demand motives:

1. Provision with special knowledge and skill.
2. Strengthening of management capacity on a temporary basis.
3. Impartial outside reflection of the business.
4. Legitimisation of management decisions.
5. Learning through consulting.

However, Ernst and Kieser (1999) propose a more general explanation of the demand for management consultancy in the continuously increasing complexity and dynamics of the environment businesses are operating in. They argue that developments, such as globalisation, new technologies (notably information technology), the deregulation of markets and the intensification of competition, are some of the most important factors generally associated with the demand for consultancy services. From the perspective of top management, it becomes more and more difficult to understand and control complex and highly specialised systems and a need emerges for external management consultants who are able to recommend decisions based on a holistic understanding of a given problem (Ernst and Kieser, 1999).

Consultancies can be viewed as having two fundamental dimensions (Kubr, 1996); a technical dimension and a human dimension. The technical dimension concerns the nature of the work for which the consultant is hired and this dimension can vary greatly in content; for example, between management consultancy and IT consultancy.

The technical dimension involves advice to managers, based on competence in a specific area of operational expertise, about organisational systems and structures. The human dimension, in contrast, concerns "interpersonal relationships in the client organisation…and the interpersonal relationship between the consultant and the client" (Kubr, 1996). Kubr further argues that the technical and human dimensions relate to two aspects of knowledge, which are content knowledge and process knowledge. These correspond to the two aspects of management, the technical and relational components. The technical component of management is the non-managerial aspect of a manager's work, the non-consultancy aspect of consultants' work. Analogously, the relational component of management is the properly managerial aspect of a manager's work, the consultancy aspect.

One can argue that process knowledge remains the same for all management consultants and is applicable in every consultancy engagement; thus, providing the organising principle for management consultancy.

Thus, the consultant-client relation in literature is further examined in the following section.

2.1.1 Consultant-Client Relationship

From a process viewpoint, the client consultant relationship takes the form of a set of activities required for achieving the desired objective. These activities comprise the consulting process and many different ways of subdividing the process, or cycle, into major phases can be found in the literature. Examples of different models with different phases (from a range of authors) are summarised in Table 1.

Table 1 Key Stages in Client-Consultant Relationship

Ford (1990)	Frazier (1983)	Dwyer et al. (1987)	Wilson (1995)	Kubr (1996)
Pre-relationship	Review	Awareness	Search and selection	Entry
Early stage		Exploration	Defining purpose	Diagnosis
Development stage	Implementation	Expansion	Setting boundaries	Action planning
Long-term stage	Outcomes	Commitment	Value creation	Implementation
Final stage			Hybrid stability	Termination
		Dissolution		

Each of the identified models may differ in the range of phases involved in the relationship but they all share an important conceptual commonality, as identified in the model from Kubr (1996), which are entry, diagnosis, action planning, implementation and termination. This provides a good framework for illustrating what consultants actually do and for structuring and planning particular assignments and projects. Table 2 shows Kubr's (1996) expansion of his five phases.

Table 2 Phases of a Generic Consulting Process

1. Entry	• First contact • Preliminary problem discussion • Assignment planning • Assignment proposals to the client • Consulting contract
2. Diagnosis	• Fact finding • Fact analysis and synthesis • Detailed problem examination
3. Action planning	• Developing solutions • Evaluating alternatives • Proposals to the client • Planning for implementations
4. Implementation	• Assisting with implementation • Adjusting proposals • Training
5. Termination	• Evaluation • Final report • Setting commitment • Plans for follow-up • Withdrawal

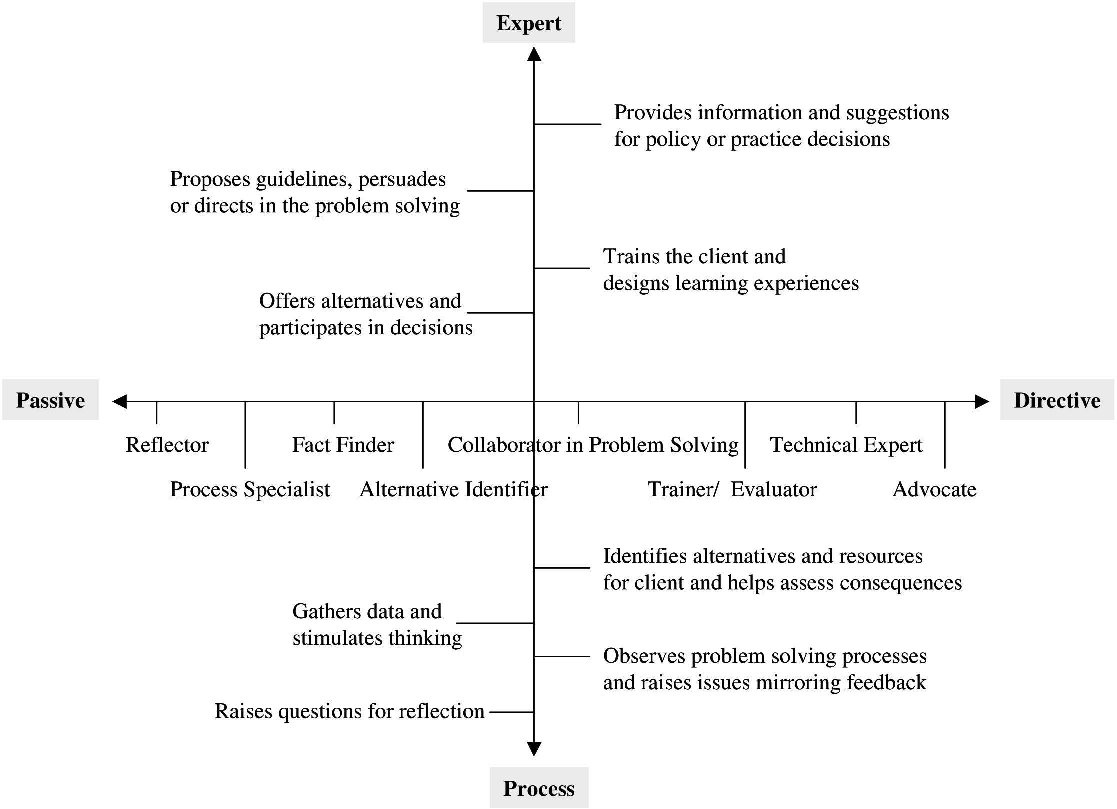
Source: Kubr (1996)

The formulation of a problem initiates the consulting process. After having established a first contact, a mutual diagnosis and definition of the problem is pursued. Kubr argues that already at this early stage, the problem, analytic strategy and solution are defined and negotiated and he argues that the type of problem agreed on at the beginning predetermines the roles a consultant takes during the consulting process.

Diagnosis, action planning, implementation and termination depend largely on the extent to which the consultant is asked to intervene (Kubr, 1996). However, the consultant-client relationship is in the centre of the consulting process and researchers have defined different forms of consultant roles. The two most commonly used categorisations to distinguish between different types of consultant roles are content vs. process and the directive/non-directive continuum (Kubr, 1996; Schreyögg and Noss, 1995).

Kubr (1996) also introduced a model that focuses on the extent of direction provided by consultants in their activities (Figure 1).

Figure 1. Roles of Consultants


Expert
Provides information and suggestions for policy or practice decisions
Proposes guidelines, persuades or directs in the problem solving
Trains the client and designs learning experiences
Offers alternatives and participates in decisions
Passive
Directive
Reflector
Fact Finder
Collaborator in Problem Solving
Technical Expert
Process Specialist
Alternative Identifier
Trainer/ Evaluator
Advocate
Identifies alternatives and resources for client and helps assess consequences
Gathers data and stimulates thinking
Observes problem solving processes and raises issues mirroring feedback
Raises questions for reflection
Process

Source: Kubr (1996)

The combination of dimensions in this model helps to define different types of consultant-client interactions ranging from highly directive and expert to passive and process-based consultancies. For example, traditional technical assistance, which is generally dominated by directive expert consultancy with some degree of process support, would be placed somewhere in the upper right-hand quadrant. Process consultancy that emphasises facilitation of client groups and collaborative problem solving, as described by Schein (1988), would be located somewhere in the lower left-hand quadrant. However, such categorisations may also change over time and, sometimes, an intervention may start exclusively as an expert-oriented consultancy and then become transformed later into a process-oriented consultancy.

In all these forms of interaction between consultant and client, knowledge is transferred or generated on both sides. In principle, the different forms of consultant-client interactions relate to the knowledge flows between the consultant and the client. Knowledge flow tends to be one-directional from the consultant to the client in directive, content-based consulting and bi-directional in non-directive, process-based consulting. Considering this, consulting could be defined as recognising and transferring knowledge from one place and time to another (Hargadon and Sutton, 2000; Sarvary, 2002; Hansen et al., 1999). Thus, the main goal of consultancy is knowledge transfer, in which the consulting process should be a mutual learning process, solving problems between client and provider (Kubr, 1996).

Clients' problems range from those that are new to the consultancy to problems that are familiar. This distinction is relevant because, from a knowledge perspective, they can then differentiate between exploration and exploitation activities. Applied to consultancy practices, explorative consulting is about creating knowledge that is new for the consulting firm. Exploitative consulting practices are associated with leveraging existing knowledge known to the consulting firm. For well-established management consultancies, only a few assignments are new to the firm. Management consultancies accumulate knowledge over time and, thus, client problems become familiar and an exploitative approach in the assignment could be applied. In other words, accumulation of knowledge through learning from assignments expands the range of known solutions for clients' problems. Over time, this development results in a decrease of explorative practices and an increase of exploitative and hybrid practices.

Thus, it is evident that the provision of knowledge that their clients do not have is at the centre of management consultancy (Greiner and Metzger, 1983). It can be concluded from the above that the generation of new knowledge, as well as the reuse of existing knowledge, is of central value for a management consultancy.

Deriving from this, one can classify management consultancies as knowledge-intensive because, as commented earlier, they provide knowledge as their product. Thus, management consultancies are typical examples of KIBS, knowledge-intensive business services (Zack, 1999).

2.1.2 Knowledge-Intensive Business Services

Knowledge-intensive business service (KIBS) firms rely heavily on knowledge or expertise related to a specific domain. They can also be described as firms performing services for other firms mainly encompassing a high intellectual value added approach (Muller, 2001). The term ‘KIBS’ was first used by Miles et al. (1994) and ‘knowledge-intensive business services’ refers to organisations with a specific class of business processes, those that can be described to be of high task complexity and high knowledge intensity (Remus and Schub, 2003). However, this definition of KIBS is usually confronted with the problem of grasping the heterogeneity of existing service activities. Nevertheless, KIBS have some common characteristics (Malerba, 2005) and Strambach et al. (2007) argues that KIBS generally have the following common characteristics:

- Knowledge is not only a key production factor of KIBS; it is also the ‘product’ they sell in form of non-physical intangible services.
- Provision of these knowledge-intensive services requires in-depth interaction between supplier and user and both parties are involved in cumulative learning processes. Thus, providing knowledge-intensive services is more than selling and purchasing standardised external services.
- In KIBS, the main activity of consulting must be understood as a process of problem solving in which the supplier adapts their expertise and expert knowledge to the needs of the client. The problem-solving process is, in principle, the interaction process, the client-consultant relationship between KIBS and their customers.

In this sense, management consultancies must be classified as knowledge-intensive professional services because management consultancies provide non-material intangible services, such as specialised expert knowledge, research and development ability and problem solving as their products. Consulting, training and education offered by management consultancies are typical examples of KIBS knowledge-intensive business services (Zack, 1999).

2.1.3 Knowledge-Based View

Knowledge has been generally recognised as an organisational and commercial variable (Dixon, 2000; Brown and Duguid, 2001) and the value of knowledge for organisational success is well documented (Dixon, 2000; von Krogh et al., 2000). For many authors (for example, Grant, 1996; Spender, 1996; Teece, 2000; Eisenhardt and Santos, 2002), knowledge is the most strategically significant resource of the firm. Companies need to "know what they know" and how they can use their knowledge more effectively to gain or sustain competitive advantage (Mahapatra et al., 2005).

The success of KIBS strongly depends on the ability to gather information/knowledge, to integrate it into existing organisational knowledge, to share and leverage it and to apply it to create value for clients. Consequently, from this perspective, knowledge is a resource as well as a strategic asset (Bollinger and Smith, 2001).

A result from such considerations is the knowledge-based view of a firm, which can be considered an outgrowth of the resource-based view of the firm (Grant, 1996). Since its earliest formulations, the knowledge-based view of competitive advantage has recognised firms as superior mechanisms of knowledge application (Grant, 1996). From this perspective, new knowledge is a key component in the competitive capabilities that are embedded in the operating routines, products and services that produce value in an organisation. New knowledge forms a conceptual bridge between two theoretical views in the sense that processes captured in the knowledge-based view tie a firm's performance to the resource-based view (Barney, 1991).

In this context, the process of knowledge creation and utilisation as a source of competitive advantage or superior organisational performance can be summarised as a problem that triggers the search for an acceptable solution and, consequently, the creation of a solution is new knowledge generation. The new solution might or might not depend on existing knowledge. Correspondingly, the concept of intellectual capital (2.1.3.1), where knowledge is defined to be a resource, was created for the understanding of the rapidly changing and turbulent business environments of KIBS.

2.1.3.1 Knowledge as a Resource

Some authors have formulated knowledge taxonomies founded on the resource-based view and in the form of different types of knowledge resources; some examples are given in Table 3.

Table 3 Some Examples of Types of Knowledge Resources

Author	Knowledge Resources
Leonard-Barton (1995)	Employee knowledge Knowledge embedded in physical systems
Sveiby (1997)	External structures Internal structures Employee competencies
Petrash (1996)	Human capital Organisational capital Customer capital
Stewart (1997)	Intellectual capital
Bontis (2001)	Human capital Structure capital Relational capital

Leonard-Barton (1995) identifies employee knowledge and physical systems as two types of organisational knowledge resources. Sveiby (1997) incorporates customer capital within the notion of external knowledge resources, which includes knowledge resources other than customers, e.g. suppliers. Most other frameworks posited in the literature assume that knowledge resources exist because knowledge manipulation activities must operate on something. Learning actively creates, captures, transfers, and mobilises knowledge and the key aspect of organisational learning is the interaction that takes place among individuals (Bontis, 2001). Consequently, intellectual capital is the stock of knowledge within the firm. Petrash (1996) recognises employees' knowledge as human capital but adds two additional kinds of knowledge resources: customers, referred to as customer capital, and organisational capital (processes, structures and culture).

Stewart (1997) defines intellectual capital as the intellectual material that has been formalised, captured, and leveraged to create wealth by producing a higher-valued asset. It is relevant that, in this perspective, intellectual capital does not include intellectual property such as copyrights, patents etc.

Bontis (2001) defines in more detail that intellectual capital encompasses human capital, structural capital, and relational capital; in other words, the knowledge found in human beings, organisational routines and network relationships.

- *Human capital* refers to the capability to solve a problem and is the source of creativity. This is similar to the terms 'employee knowledge', 'employee competencies' and 'professional intellect' proposed by Leonard-Barton (1995), Sveiby (1997) and Quinn (1992) separately. This is relevant to employees and their experience, competencies, know-what, know-how, know-why, and self-motivated creativity (Davenport and Völpel, 2001).
- *Structural capital* is the organising capability of an organisation in order to satisfy the needs of the market. The organising capability refers to organisational structure, processes, systems, patents, culture, documented experience and knowledge and the capability to leverage knowledge through sharing and transferring (Stewart, 1997; Holsapple and Joshi, 2003). This is similar to the terms 'internal structures' and 'organisational capital' proposed by Sveiby (1997) and Petrash (1996).
- *Customer capital* concerns the relationship between an organisation and its stakeholders, such as a supplier or customer relationship, brands, and reputation (Stewart, 1997; Holsapple and Joshi, 2003); Sveiby (1997) called it "external structure."

The perspective of knowledge as intellectual capital emerged from a more economics-oriented view, arising from the observation that knowledge was invisible in organisational accounting and measurement systems (Miller, 1996; Sveiby, 1997; Edvinsson and Malone, 1997). The perspective of intellectual capital is more focused on the management and measurement of knowledge-related competencies, with relatively little emphasis on knowledge generation and learning (Tuomi, 2002). However, an inherent conceptual problem in this approach is the notion that knowledge could be described, analysed, and accounted for. Thus the intellectual capital idea typically deals with corporate finance, control and accounting. The main concern of this approach is the return on investment (ROI) in existing knowledge assets, as well as the protection of intellectual property.

So far, it could be concluded that knowledge is widely recognised as a key factor for competitiveness and that knowledge is a prerequisite for sustainable success (Ganguly, 2000). In other words, a KIBS success is largely dependent on its ability to capture and exchange critical knowledge in order to sustain or grow its competitive advantage.

Related to the discussion of the knowledge-based view and intellectual capital is the vision of the knowledge society and knowledge economy. The key component of a knowledge economy is a greater reliance on intellectual capabilities than on physical inputs or natural resources (Powell and Snellman, 2004). The knowledge economy highlights the value of social networks, customer relationships and organisational learning embedded in organisational procedures and systems.

If the term ‘knowledge economy’ is primarily concerned with knowledge as a commodity and the value of intellectual labour in the creation of wealth, then the term ‘knowledge society’ needs to concern the social climate in which the knowledge economy resides (Carlaw et al., 2006). In this sense, the concept of knowledge society considers a much broader social context. Carlaw et al. (2006) argue that, while the concept of the knowledge economy reduces knowledge to an object of economic value, the concept of knowledge society acknowledges the social and cultural factors that generate knowledge’s intrinsic value beyond its worth as a resource.

This perspective of knowledge assumes that knowledge is not static but is rather a dynamic concept created in social interactions (Jakubik, 2007). In other words, it defines knowledge as a social construct; however, there are different perspectives on knowledge.

2.1.4 Perspectives on Knowledge

Hislop et al. (2000) identifies two perspectives on knowledge: the objectivist perspective and the practice-based perspective.

The objectivist perspective considers knowledge to be “an integral, self-sufficient substance, theoretically independent of the situations in which it is learned and used” (Hislop et al., 2000). In this sense, knowledge can be codified and separated from the minds of people. In considering Alavi and Leidner (2001), this perspective on knowledge actually refers more to information than to knowledge (see 2.2.1) embedded in human minds. From the objectivist perspective, the nature of knowledge is seen as objective and free from individual subjectivity. Furthermore, the objectivist perspective defines these two types of knowledge as opposites and not as a spectrum and the focuses is more on objective knowledge.

The practice-based perspective on knowledge stresses that knowledge resides in the minds of people and can be defined as that which is known, i.e. knowledge being embedded in individuals (Polanyi, 1967). Only people can ‘know’ and convert ‘knowing’ into action, and it is the act of thinking that can transform information into knowledge and create new knowledge (McDermott, 1999). In this perspective, knowledge work involves an element of activity and all activities include knowledge. The practice-based perspective on the objective and individual, subjective dimensions of knowledge is to see them as inseparable, mutually constituted aspects of knowledge. From this perspective, knowledge always has a subjective component, e.g. requiring understanding or requiring action in the form of making a decision. Furthermore, this perspective assumes that all knowledge is personal, impossible to be separated from people into an entirely explicit form and is socially constructed and culturally embedded.

In order to understand knowledge, it is important to review basic definitions and there has been no shortage of authors providing their own definitions of this term.

2.2 Conceptualisation of Knowledge

Epistemology is the theory of knowledge and epistemology refers to the study of knowledge, including questions concerning what counts as knowledge and how bodies of knowledge can be systematically organised (Uschold and Gruninger, 1996). Literature shows that knowledge is complex and is not subject to simple definitions. In order to define knowledge it might be easier to state what knowledge is not.

2.2.1 Knowledge, Information and Data

Nonaka and Takeuchi (1995) identify the difference between information and knowledge as information being a flow of messages and knowledge being what is created by that very flow of information. Starbuck (1990) defines knowledge as a stock of experience rather than a flow of information. Davenport (1997) asserts that data are simple observations of states of the world. Data are easily structured, captured on machines, often quantified, and easily transferred. Drucker (1998) defines information as data endowed with relevance and purpose. Information requires units of analysis and needs consensus on meaning. Davenport (1997) argues that knowledge consists of 'valuable information' from the human mind and includes reflection, synthesis and context. In contrast, Boersma and Stegwee (1996) and van der Spek and Spijkervet (1997) argue that knowledge can also be embedded in entities other than human beings. Besides human knowledge, Boersma and Stegwee (1996) also identify mechanised knowledge (where the knowledge necessary to carry out a specific task has been incorporated in the hardware of a machine), documented knowledge (where knowledge has been stored in the non-machine form of archives, books, documents, ledgers, instructions, charts, design specifications etc.) and automated knowledge (where knowledge has been stored electronically and can be accessed by computer programs that support specific tasks).

The key distinction between information and knowledge, as argued by Alavi and Leidner (2001), is that information is converted to knowledge once it is processed in the mind of individuals and knowledge becomes information once it is articulated and presented in the form of text, graphics, words, or other symbolic forms.

2.2.2 Definitions of Knowledge

Although, literature provides many definitions of knowledge, there is still no generally accepted definition (Targama and Diedrich, 2000). Researchers accept that they have failed to agree on a common definition of what constitutes knowledge (Biggam, 2001). However, the objective of this research is not to join this never-ending discourse. A definition will be used which encompasses those characteristics of knowledge that have relevance to developing the framework, which is the aim of this research.

A popular definition of knowledge is given by Davenport and Prusak (1998), who define it as “a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating”.

This definition follows, at least partially, the tradition of the school of philosophers referred to as empiricists. Argyris (1993) defines knowledge as “the capacity for effective action”. However, one can argue that the above definition from Argyris is problematic because knowledge does not necessarily lead to action in all cases and the capacity to take action does not imply the possession of the corresponding knowledge for action. Additionally, the use of the word ‘effective’ is unclear because it depends on personal judgement. A less problematic definition from the same perspective is given by Dalmaris (2006), who states “Knowledge is solutions to problems”. Knowledge from this perspective is linked to the ability to solve problems and a prerequisite to superior performance of entities; for example, organisations.

This research is about management consultancy which is, as shown earlier, a typical representation of a KIB. Their main activity is the process of problem solving in which they adapt their expertise and expert knowledge to the needs of the client. The problem-solving process is, in principle, the interaction process of the client-consultant relationship between a KIB and their customers. In the light of the definitions above and this research’s focus on BPs, knowledge is regarded as *guiding in action and is linked to the ability to solve problems.* Thus, knowledge in this research can be defined as being linked to the ability to solve problems and a prerequisite to the performance of BPs.

Consequently, the success of KIBS depends on the ability to manage knowledge and, from this perspective; knowledge is a resource and also a strategic asset. Thus, all organisations, especially KIBS, have to manage knowledge in order to convert it into business benefits

2.3 Knowledge Management

Although many aspects of KM have been discussed in the earlier sections, the definitions of KM and its development in time are reviewed here.

Many authors argue that KM is not a unified field and competing points of view about KM can be identified. Consequently, depending on the perspective on KM, there are diverse views of what KM is and this lack of consensus is presented in Table 4, in which a summary of the most commonly used definitions is presented. More definitions could have been found with little extra effort; for example, Hlupic et al. (2002) presented 18 different definitions for the term 'KM'. For the purposes of this study, it is unnecessary to draw an all-inclusive list of definitions.

Table 4 Samples of KM Definitions

Author	Definition
Brelade and Harman (2001)	KM is the acquisition and use of resources to create an environment in which information is accessible to individuals and in which individuals acquire, share and use that information to develop their own knowledge and are encouraged and enabled to apply their knowledge for the benefit of the organisation
Davenport and Völpel (2001)	KM consists of processes to capture, distribute, and effectively use knowledge.
DeTienne et al. (2004)	KM means effective knowledge transfer, which in turn is based on a culture that includes co-operative involvement, trust, and incentives
Hlupic et al. (2002)	KM contains technical ('hard'), organisational ('soft'), and philosophical ('abstract') aspects.
Huysman and de Wit (2004)	KM is perceived as organisational practices that facilitate and structure knowledge sharing among knowledge workers.
Kessels (2001)	KM is to transform organisations with just smart people to smart, knowledge-productive organisations. The ability to gather information, generate new knowledge, disseminate and apply this knowledge to improve and innovate is an organisation's knowledge productivity.

Lehaney (2003)	KM refers to the systematic organisation, planning, scheduling, monitoring, and deployment of people, processes, technology, and environment, with appropriate targets and feedback mechanisms, under the control of a public or private sector concern, and undertaken by such a concern, to facilitate explicitly and specifically the creation, retention, sharing, identification, acquisition, utilisation, and measurement of information and new ideas, in order to achieve strategic aims, such as improved competitiveness or improved performance, subject to financial, legal, resource, political, technical, cultural, and societal constraints.
Nonaka and Takeuchi (1995).	The purpose of KM is to make an individual's or group's knowledge available to everyone in the organisation to be utilised and become the organisational knowledge
O'Dell and Grayson (1997)	KM is a conscious strategy of getting the right knowledge to the right people at the right time and helping people share and put information into action in ways that strive to improve organisational performance.
Sveiby (2003)	KM is a dynamic approach to optimally manage critical business knowledge aimed to generate value. KM is the art of creating value from an organisation's intangible assets.
Tiwana (2001)	The main objective in KM is to manage an organisation's knowledge, both tacit and explicit, so that it can be utilised across the organisation more effectively and efficiently.

From Table 4, it is evident that the current literature applies a very diverse range of meanings to KM and, in many definitions, it can be seen that KM is, indeed, not a unified field. Prusak and Cohen (2001) argue that, in academic literature, KM is mainly approached from the following four perspectives:

- The philosophical and psychological perspective focuses on what knowledge is, where it comes from, and what the mechanism for processing it is.
- The organisational and sociological perspective deals with the key question of how to create and master knowledge together.
- The economic/business perspective concerns on the value of knowledge.
- The technological perspective focuses on efficient and effective tools for storing, delivering and mining knowledge.

In the context of KM categories, some authors, e.g. Batista (2005), argue that KM can be classified into fewer main categories, namely:

- KM focused on aspects of human resources management which facilitate the transfer, dissemination and sharing of information and knowledge.
- KM linked primarily to the structuring of organisational processes that work as facilitators in the creation, retention, organisation and dissemination of organisational knowledge.
- KM in which the central focus is the technological and functional foundation for organisational KM, including applications and tools (in particular, information and communication technology).

One can further summarise that there are two main areas of KM. The first is mostly interested in understanding how information and communication technologies (ICT) can be applied to improving information and knowledge utilisation in different kinds of organisations and business environments. The second one focuses on behavioural and managerial aspects of KM in organisations. Similarly, identifying this ambiguity in KM, Alavi and Leidner (2001) formulated these two distinctive perspectives on KM, as follows:

- From a technological perspective, IT becomes instrumental in facilitating the KM processes involving knowledge creation, knowledge storage/retrieval, knowledge transfer, and knowledge application within organisations. Thus, the technical perspective is defined as comprising of subsystems that interact and connect together to enhance organisational performance: database subsystem, organisational language subsystem, networking subsystem, and transfer subsystem (Alavi and Leidner, 2001). KM from this perspective focuses on the technology, system design and implementation of KM systems. The role of technology is often to overcome barriers of time or space that otherwise would be limiting factors and IT is a tool to help people work together more effectively.

- From the organisational perspective, KM focuses on the combination of technology, organisational culture and organisational context issues. In this sense, knowledge is a (new) element and the function of organisational capabilities is to manage knowledge strategically (Barnes, 2002). This perspective mainly looks at KM in the areas of the organisation's capability in managing their knowledge resource.

However, the concept of KM is not accepted by everyone as something new. Spiegler, (2000) questions whether the idea of KM is just a recycled concept. Computer science researchers, in particular, have questioned whether KM, from a technological perspective, is anything new (Ekbia and Hara, 2008). Such voices are, at least, partly justified because it seems difficult to differentiate KM's technological perspective from information management. Thus, information management is an essential element of KM and ICT can be applied to attaining the objectives of KM.

The technological perspective may be seen as an early understanding of KM and the organisational perspective could be interpreted as the next step in the development of KM during the last two decades.

2.3.1 Advancement of KM Research

The importance of knowledge to the development of society has been recognised by writers and philosophers since the ancient Greek period; for example, the ancient Greek philosopher Plato, (Denning, 2000; Gamble and Blackwell, 2001; Nonaka and Takeuchi, 1995). In this sense, philosophical thinking about knowledge has existed for more than two millennia. The modern concepts of KM, particularly those associated with cognitive and information sciences are quite recent (Wiig, 1999). However, by the mid-20th century, knowledge as a subject of interest to management emerged (Grant and Grant, 2008). Of special note at that time was Polanyi (1958), who set the foundation for much of the later theoretical work by distinguishing skills and how to derive them from knowledge. In this sense, he introduced the later distinction of tacit and explicit knowledge (compare sections 4.3.1 ff). In the recent two/three decades, the impact of ICT introduced the concept of information as distinct from data and knowledge. Such concepts emerged in the 90s, gaining more practitioner interest as the power of computers grew. Wiig (1999) summarised that the evolution of KM has emerged over the last decades as a result of many intellectual, societal and business forces.

Grant and Grant (2008) elaborated an overview about the development of KM during the last two/three decades and summarises the development by identifying five major themes of KM evolution:

- *The management and exploitation of 'intellectual capital':* KM as a distinct discipline emerged by the mid-1990s and Sveiby's early work; for example, Sveiby and Risling (1986) can be seen as the beginning of KM (Grant and Grant, 2008). Sveiby and Risling (1986) presented the concept of the value of 'know-how' and argued that this intellectual capital can be identified, measured and managed. Similarly, Stewart (1997) suggested that "managing, finding and growing intellectual capital, storing it, selling it, sharing it has become the most important economic task of individuals, businesses, and nations."
- *Organisational Learning and Communities of Practice (Social views of knowledge)*: The concepts of organisational learning and communities of practice evolved from the work of Schön (1983), Levitt and March (1996) and Senge's (1990) famous book 'The Fifth Discipline'. In this concept, organisational learning was seen as adaptive learning, responding to environmental change and proactive learning to pursue corporate goals. Brown and Duguid (1991) and Lave and Wenger (1998) discuss the importance of informal communities of practice in success for learning organisations, linking working, learning and innovation.
- *Knowledge work and knowledge models and processes:* Drucker (1992) introduced a new key element in work, the 'knowledge worker'. As discussed earlier, the term 'KIBS' was first used by Miles et al. (1995) and knowledge-intensive business services refers to organisations with a specific class of business processes, those that can be described to be of high task complexity and high knowledge intensity (Remus and Schub, 2003). This period also embraced the concept of knowledge models. These models from Nonaka and Takeuchi (1995) and Nonaka and Kono (1998) are likely to be the most widely adopted KM concepts and their dominance is evident by the fact that it is the most referenced material in the KM field (Grant and Grant, 2008; Serenko and Bontis, 2004). As discussed earlier, one can conclude that, despite the variety of other knowledge classification systems, Nonaka and Takeuchi 's interpretation of Polanyi's original tacit vs. explicit knowledge concept dominates the literature - both academic and practitioner. Furthermore, in this period, KM researchers focused on knowledge processes and on business process re-engineering. A

number of authors, such as Davenport and Prusak (1998), discussed the issues relevant to applying process models to knowledge work. In this context, as is discussed later in detail, the emergence of the phenomenon of knowledge-intensive business processes raised the need for an integration of the existing research domains of business processes and KM (Strohmaier, 2005).

- *The use of ICT to capture, codify and share knowledge:* By the mid-1990s, the evolution of ICT reached a state that, in many organisations, applications such as email, intranet, and groupware (e.g. Lotus Notes) were being introduced, resulting in an increased access to information. More recently, this has continued with the emergence of Web 2.0 with close links to the knowledge field, such as wikis, blogs and social networking tools (O'Reilly, 2005; McLean, 1999). These latest developments should be more fully adopted by KM in the near future.
- *The need for KM at both the strategic and operational levels*: As previously discussed, a firm's knowledge was seen as a key element of the resource-based view (RBV) and as part of strategic planning (Grant, 1996). This strategic view also held that knowledge forms a basis for competitive advantage (Zack, 1999) and Hansen et al. (1999) suggest that the key strategic choice is between a codification approach and a personalisation approach.

Gamble and Blackwell (2001) argued that KM theory emerged as a result of a number of new management approaches over the last decades and that the most notable developments occurred after the 1980s. Many authors identify at least three generations of KM (Filos, 2006; Firestone and McElroy, 2003a; Grant and Grant, 2008, Hong and Staehle, 2005; Ponzi and Koenig, 2002; Snowden, 2002). However, Firestone and McElroy (2003a) argue that there are some difficulties with these classifications in order to elaborate a consistent underlying conceptual framework of the stages of KM.

The main difficulties in these approaches become visible by discussing the three stages approaches from Ponzi and Koenig (2002), Filos (2006), Hong and Staehle (2005), and Snowden (2002), which have the following simplified main characteristics:

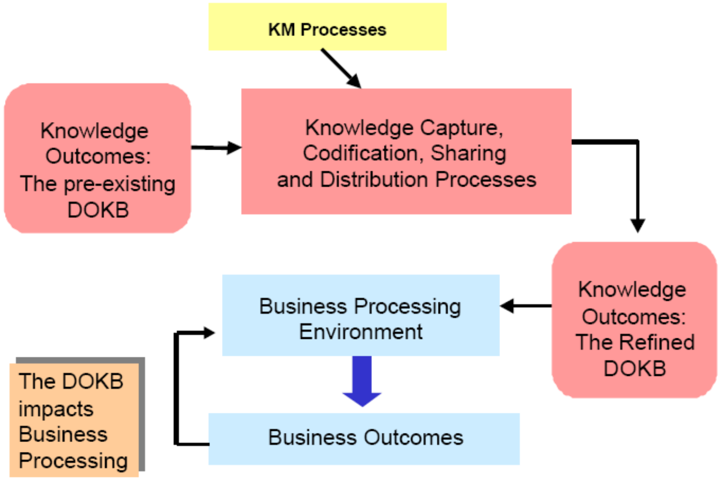
- The first stage of KM is about applying technology (ICT) (Ponzi and Koenig, 2002; Filos, 2006; Hong and Staehle, 2005; Snowden, 2002; Firestone and McElroy, 2003a; Grant and Grant, 2008).
- The second stage is primarily a recognition that KM is not only about applying technology but was also about human and cultural factors and organisational learning (Ponzi and Koenig, 2002; Hong and Staehle, 2005; Snowden, 2002). The second stage, furthermore, is only about knowledge conversion and fails to identify the generation of knowledge (Firestone and McElroy, 2003a).
- There are many perspectives on the third stage of KM, such as Wiig's (2004) perspectives from social KM, Snowden's view (2002) of the interplay of context and content and Firestone and McElroy's (2003a) view of the third stage as second generation KM (SGKM).

However, the first and second stage of KM primarily only record shifting fashions and have no fundamental shifts in disciplinary concerns (Grant and Grant, 2008). A further difficulty is that the dates of the stages are unclear (Firestone and McElroy, 2003a) and thus it is very hard to characterise a particular period as a stage (Firestone and McElroy, 2003a). Another difficulty of the stages is the *ad hoc* character of classification, apparently based on anecdotal and personal observation and there is no underlying conceptual framework organising the analysis of change (Firestone and McElroy, 2003a). Most importantly, due to the lack of a conceptual framework, these approaches fail to provide an adequate analysis of the past and also fail to provide a road map for the future. Nevertheless, all of these approaches identify and confirm the development of KM during the last decades.

2.3.2 First Generation KM (FGKM)

Filos (2006), Hong and Staehle (2005) and Ponzi and Koenig (2002) argue that the first 'technocratic' generation of KM focused on computer technology, without acknowledging the importance of the human input. In FGKM, the focus was on the use of ICT, particularly the Internet, intranets and tools for knowledge sharing. Thus, FGKM was more about information than about knowledge and the main tasks in FGKM were to capture, store, retrieve, and access explicit knowledge/information. The successful creation of business systems to facilitate the acquisition of knowledge about competitors using new scientific trends and developments, serves as an example of this stage of KM (Hong and Staehle, 2005). Similarly, Tuomi (2002) argues that the first generation of KM focused on information sharing, information repositories and intellectual capital accounting. Furthermore, FGKM has focused on enhancing the performance of day-to-day business processes and thus it is frequently characterised as being all about getting the right information to the right people at the right time (Firestone, 2004). Firestone and McElroy (2003a) have a further perspective on FGKM, namely that, in FGKM, knowledge already exists in organisations and is used to support decisions (see Figure 2). Based on such considerations, Firestone and McElroy (2003a) suggested the distributed organisational knowledge base (DOKB). The DOKB, which is shown in Figure 2, manifests itself as "containers of knowledge" (Firestone and McElroy, 2003a).

Figure 2. The Concept of FGKM


KM Processes
Knowledge Outcomes: The pre-existing DOKB
Knowledge Capture, Codification, Sharing and Distribution Processes
Knowledge Outcomes: The Refined DOKB
Business Processing Environment
Business Outcomes
The DOKB impacts Business Processing

Source: Firestone and McElroy (2003a)

From this perspective, FGKM cannot track the production of knowledge and also cannot clearly distinguish between the knowledge and information content of the DOKB (Firestone and McElroy, 2003a). Firestone (2004) further states that FGKM also cannot distinguish information management from KM.

Summarising the above discussion, the leading criticism of FGKM is:

- *The strong focus on technology* (Binney, 2001; Firestone, 2004; Firestone and McElroy, 2003a; Filos, 2006; Harris, 2006; Hong and Staehle, 2005; Ponzi and Koenig, 2002; Swan and Scarborough, 2002).
- *The questionable validity of the FGKM models.* Marren (2003), Schultze and Stabell (2004) and Styhre (2003) criticise FGKM as being used simply as a synonym for information management. In FGKM, there is relatively little focus on getting the right knowledge or confirming the validity of that knowledge and its relevance for the situations in which it is being used (Grant and Grant, 2008). Surprisingly, KM literature is largely silent on this issue and there is limited attention paid to it in more theoretical work (Grant and Grant, 2008).

Triggered by the criticism of FGKM, several authors developed views of what the second generation of KM might be.

2.3.3 Second Generation KM (SGKM)

Snowden (2002), Sveiby (2001), Wiig (2004), Firestone and McElroy (2003a) and Firestone (2004) suggested different interpretations of second generation KM (SGKM).

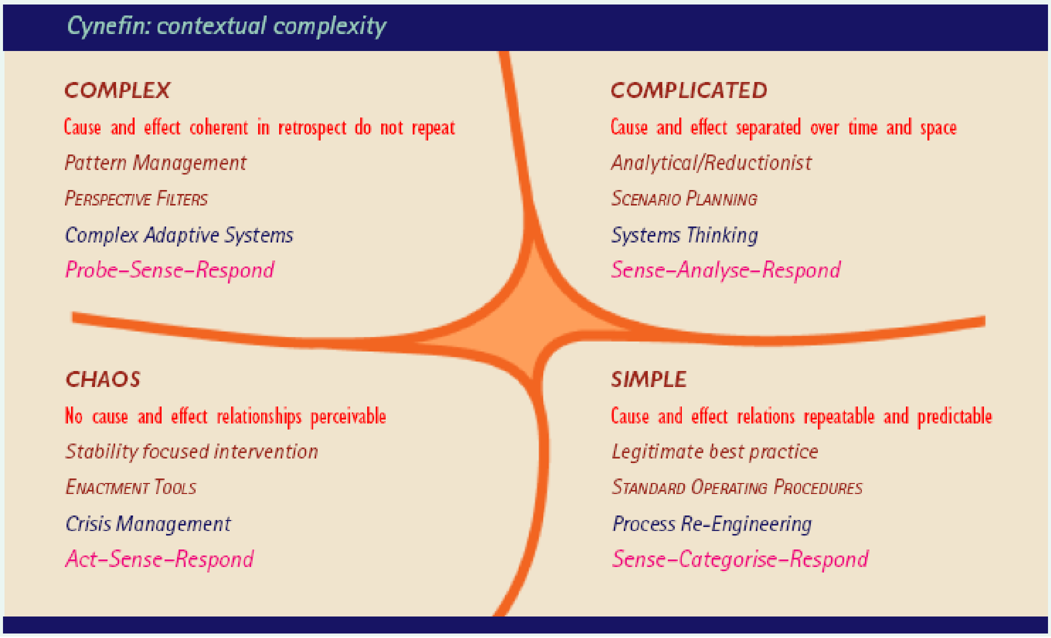
2.3.3.1 Snowden's Cynefin Framework

Snowden (2002) argues that SGKM is not a simple evolution, but a change in paradigm; in particular, a shared context. As with McElroy (2003), Snowden sees a 'complex adaptive systems theory' as the key to understanding the role of KM. Snowden further argues that a shared context is needed for understanding and KM is creating information from data by the provision of a shared context. He identifies three key characteristics of SGKM:

1. Knowledge can only be volunteered, it cannot be conscripted.
2. We can always know more than we can tell and we will always tell more than we can write down.
3. We only know what we need to know when we need to know it.

Snowden has used the word 'Cynefin', a Welsh word meaning 'a place', to label his 'sense-making' framework, which was developed to distinguish between formal and informal communities (Figure 3).

Figure 3. The Cynefin Framework


Cynefin: contextual complexity
COMPLEX
Cause and effect coherent in retrospect do not repeat
Pattern Management
PERSPECTIVE FILTERS
Complex Adaptive Systems
Probe-Sense-Respond
COMPLICATED
Cause and effect separated over time and space
Analytical/Reductionist
SCENARIO PLANNING
Systems Thinking
Sense-Analyse-Respond
CHAOS
No cause and effect relationships perceivable
Stability focused intervention
ENACTMENT TOOLS
Crisis Management
Act-Sense-Respond
SIMPLE
Cause and effect relations repeatable and predictable
Legitimate best practice
STANDARD OPERATING PROCEDURES
Process Re-Engineering
Sense-Categorise-Respond

Source: Snowden and Boone (2007)

Snowden (2002) defines four open spaces or domains of knowledge:

- *Complex*: where voluntary and informal networks can provide common understanding.
- *Simple or known*: where the formal organisation can usually handle knowledge activities.
- *Complicated or knowable*: where groups of professionals can create and share knowledge.
- *Chaos*: where new situations dominate and there is a need to impose pattern on chaos to make it comprehensible and manageable.

This framework is a sense-making model for understanding how to act in situations with different levels of complexity (Snowden and Boone, 2007).

In this framework, the simple and the complicated domains are ordered and are well-suited to fact-based management. In the simple domain, it is clear what is expected, cause and effect are directly related and the known can be predicated, repeated and perceived. Best practices are a good KM option for activities in this domain and investing in fail-safe design is not a bad implementation strategy (Snowden, 2002). Consequently, the complicated domain relates to situations with more variables and elements that shape causes that have certain effects over time. Nevertheless, these effects are identifiable with expert input and only analysis is needed to make sense of the interaction of different variables. In the chaos domain, there is no systemic relationship and no time exists to explore. There is also no obvious cause and effect and the decision model is to act quickly and decisively. The chaos domain is the domain of crisis management and, when deliberately entered, a domain of innovation.

However, the power of the Cynefin Framework lies in forcing the question of what can realistically be expected of decision-making responses, KM processes, and general working procedures, given that one is dealing with situations that have inherently different characteristics (Snowden, 2002).

Another prominent proponent of SGKM is Sveiby (2001), with a focus on people and intangible assets.

2.3.3.2 Sveiby's (2001) SGKM

Sveiby's (2001) view of KM is concerned with establishing environments for people to create leverage and share knowledge. He defines three families of intangible resources, which interact to create this value:

1. The *external structure* evaluates the intangible relationships with customers and suppliers, which form the basis for the reputation (image) of the firm.
2. The *internal structure* can be seen to hold patents, concepts, models, templates, computer systems and other administrative, more or less explicit, processes. These are created by the employees and are generally 'owned' by the organisation. The informal power play, the internal networks, the 'culture' or the 'spirit', can also be regarded as belonging to the internal structure.
3. The *individual competence* family consists of the competence of the professional/technical staff, the experts, the R & D people, the factory workers and sales and marketing – in short, all those who have a direct contact with customers and whose work is directly influencing the customers' views of the organisation.

In Sveiby's view, the value creation is primarily determined by the tacit/explicit transfer of knowledge between individuals and in the conversion of knowledge from one type to another. He distinguishes nine basic knowledge transfers/conversions and formulates it as questions, which have the potential to create value for an organisation. Table 5 summarises Sveiby's (2003) considerations:

Table 5 Sveiby's Basic Knowledge Transfers/Conversions

Knowledge Transfer/Conversion	Sveiby's (2003) Improvement Strategy
Between individuals	Trust building, enabling team activities, induction programs, job rotation/master apprentice schemes and so forth
From individuals to external structure	To enable employees to help customers learn about the products, eliminating red tape, permitting job rotation with customers and holding product seminars and providing client education
From external structure to individuals	The creation and maintenance of good personal relationships between the organisation's own people and persons from outside the company
From competence to internal structure	Activities focused on tools, templates, process and systems in order to be shared more easily and efficiently
From internal structure to individual	Improvement of the human-computer interface systems, action-based learning processes, simulations and interactive e-learning environments
Within the external structure	Focus on partnering and alliances, improving the image of the organisation and the brand equity of its products and services, improving the quality of the offering, conducting product seminars and alumni programs
External to internal structure	As empowering call centres to interpret clients' complaints, forging alliances to generate ideas for new products and R&D partnerships
From internal to external structure	Making the firm's systems, tools and processes effective in servicing the client, extranets, product tracking, help desks and e-business
Within internal structure	Focusing on streamlining databases, building integrated IT systems, improving the office layout

Source: Sveiby (2003)

Sveiby (2003) is repositioning the focus clearly on tacit knowledge and the aim is to improve the management of knowledge itself. The aim of KM from this view is to enable people to use their competence to create value.

2.3.3.3 Wiig's SGKM

A further important contribution in this field comes from Wiig (2004), who emphasizes the importance of creating the right corporate environment in his definition of a SGKM. This is one in which people can make personal contributions to the overall enterprise with a much deeper understanding, both of how individuals acquire, use and share knowledge and how corporations can plan and organise to use this knowledge effectively in pursuit of corporate goals. According to Wiig (2004), "societal KM is the innovation enabler by providing the driving intellectual capital resources". This societal knowledge management acts in a societal knowledge system that allows the society to prosper, the organisations to work smarter and individuals to increase their quality of life (Wiig, 2004). In Wiig's understanding, knowledge systems in an organisation change and adapt to economic and social demands. Therefore, it is important to maintain the vision and overview of the system and how it might operate in a modern, competitive society.

2.3.3.4 Common Aspects of the SGKM

Before reviewing Firestone and McElroy's (2003a) SGKM approach, some conclusions from the approaches so far discussed can be taken. They have proposed a more holistic approach and common themes to resolve the problems of the first generation. Furthermore, they suggest a new wave of thinking which recognises greater complexity in the knowledge challenges facing organisations and include consideration of KM in the context of complex adaptive systems. These SGKM approaches take the view that knowledge is of a highly of personal nature and has to take into account a variety of group or social issues.

2.3.4 New Generation KM (NGKM)

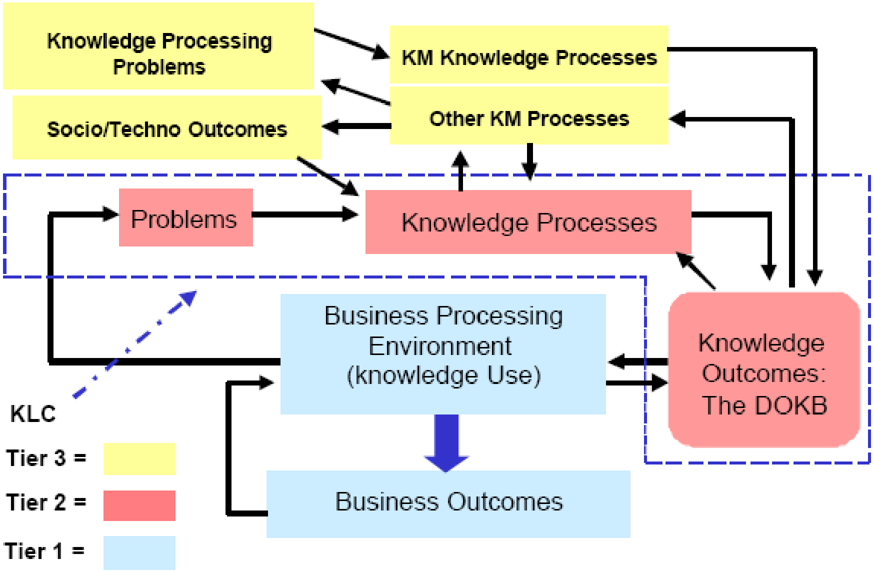
Firestone and McElroy (2003a) only distinguish between two generations of KM and, thus, their interpretation of NGKM is their second generation. The key idea in NGKM is that knowledge is embedded in, and becomes constructed in, collective practices. It is focused on the participants, the processes involved and the social interactions and initiatives among them as well as on socialisation issues, including human and cultural factors.

The NGKM stresses the importance of organisational learning applied from the work of Senge (1990), knowledge creation adapted from the SECI model of Nonaka and Takeuchi (1995) and the Communities of Practice (CoP) of Wenger et al. (2002). Firestone (2004) argues that the NGKM is distinguished from FGKM by the assumption that knowledge not only exists but is continuously created by human agents in response to the adaptive needs of organisations. Thus, their NGKM is responsible for managing knowledge creation (knowledge generation); consequently, it is concerned with managing the processes that fulfil the demand for knowledge, as well as its supply (Firestone, 2004).

A central notion is that, while practitioners of FGKM tend to begin with the rather convenient assumption that valuable knowledge already exists, practitioners of the NGKM do not. From this view, knowledge is something that is produced in human social systems (Firestone, 2004). The new perspective here is that KM is concerned with managing the processes that fulfil the demand for knowledge, as well as its supply. The NGKM aims to enhance an organisation's capacity to satisfy its demands for new knowledge and, thus, it is focused on the knowledge-production side. Helping organisations to create new knowledge faster (i.e., to accelerate their rate of innovation) is seen by demand-side thinkers as a powerful new way of increasing a firm's competitive stance in the marketplace (Firestone and McElroy, 2003a).

Furthermore, a central element in NGKM is the Knowledge Life Cycle (KLC) (Firestone and McElroy, 2003a). This is founded on the idea that knowledge is created in response to organisational need, transferred or shared among organisational agents and then used in decision making. Firestone and McElroy (2005) summarised and presented their considerations, as shown in Figure 4.

Figure 4. The Concept of the NGKM


Knowledge Processing Problems
KM Knowledge Processes
Other KM Processes
Socio/Techno Outcomes
Problems
Knowledge Processes
Business Processing Environment (knowledge Use)
Knowledge Outcomes: The DOKB
Business Outcomes
KLC
Tier 3 =
Tier 2 =
Tier 1 =

Source: Firestone and McElroy (2003a)

This concept comprises the theoretical foundations of their NGKM and includes the following three important notions, as shown in Figure 4, which are:

1. Valuable knowledge does not simply exist but, in fact, is triggered by problems and produced as a consequence of engaging in knowledge processes (Firestone and McElroy, 2003a).
2. It is not possible to manage knowledge itself, but rather to manage the knowledge processes.
3. Probably the most important consequence of the NGKM is the distinction between KM and knowledge processing.

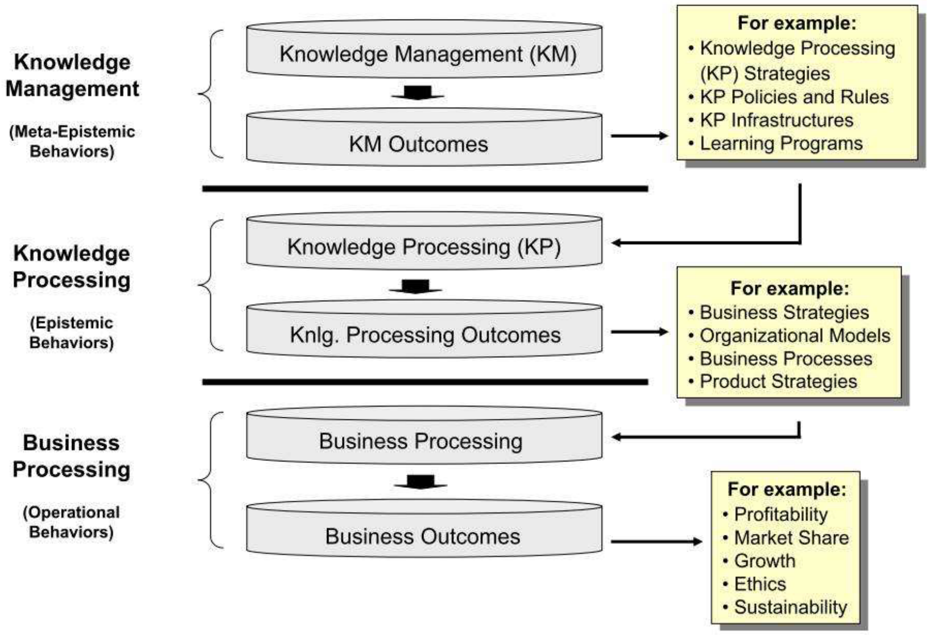
The third notion implies that KM does not directly manage knowledge outcomes but only impacts knowledge processes, which in turn impact the outcomes of business processes.

As shown in Figure 5, Firestone and McElroy (2003) distinguish three tiers in the NGKM, which are:

1. Operational business processes are those that use knowledge but, apart from knowledge about specific events and conditions, do not produce or integrate it.
2. Knowledge processes, knowledge production and integration
3. Processes for managing knowledge processes - this third tier of the organisational conceptual framework is KM

Firestone and McElroy (2005) argue that the NGKM is a new variety of KM and is of considerable interest because the approach nicely combines BPs and KM.

Figure 5. The Three-Tier Framework


Knowledge Management
(Meta-Epistemic Behaviors)
Knowledge Management (KM)
KM Outcomes
For example:
• Knowledge Processing (KP) Strategies
• KP Policies and Rules
• KP Infrastructures
• Learning Programs
Knowledge Processing
(Epistemic Behaviors)
Knowledge Processing (KP)
Knlg. Processing Outcomes
For example:
• Business Strategies
• Organizational Models
• Business Processes
• Product Strategies
Business Processing
(Operational Behaviors)
Business Processing
Business Outcomes
For example:
• Profitability
• Market Share
• Growth
• Ethics
• Sustainability

Source Firestone and McElroy (2005)

Consequently, KM affects knowledge processes and, thus, the quality of knowledge claims may improve and that may result in improvement in the quality of business processes.

2.3.5 *Business Process Oriented Knowledge Management (BPOKM)*

Strohmaier (2005) argues that the emergence of the phenomenon of knowledge-intensive business processes (KIBPs) raised the need for integration of the existing research domains of Business Process Management (BPM) and KM.

KIBS often consider their organisations in terms of business processes (BPs). Processes are considered as a generic factor in all organisations and they are “the way things get done” (Armistead, 1999). BPs are viewed as strategic assets, which require that companies take a business process orientation (McCormack and Johnson, 2001). However, Lindsay et al. (2003) acknowledge the lack of a commonly accepted definition of the term ‘business process’, which can be confirmed by the following sample definitions. A business process (BP) is:

- The complete and dynamically coordinated set of collaborative and transactional activities that deliver value to customers (Smith and Fingar, 2003).
- “Focused upon the production of particular products, these may be physical products…or less tangible ones…like a service” (Van der Aalst and van Hee, 2002).
- The set of internal activities performed to serve a customer (Jacobson et al. 1995; Lindsay et al. 2003).
- A set of partially ordered activities intended to reach a goal (Hammer and Champy 1993; Lindsay et al. 2003).
- A set of logically related tasks performed to achieve a defined business outcome (Davenport and Short, 1990).

In the last of the above definitions, Davenport and Short (1990) strongly emphasise how work is done within the borders of an organisation. Later in his research, Davenport and Prusak (1998) refined his definition and added that a BP is a specific ordering of work activities across time and place, with a beginning and an end and with clearly identified inputs and outputs and a structure for action.

Definitions of BPs may vary but underpinning the definitions is the concept of a series of interrelated activities, crossing functional boundaries, with specific inputs and outputs. Armistead (1999) and Childe et al. (1994) add that business processes must be initiated by, and must provide results to, a customer who may be internal or external to the company. Knowledge-intensive business processes (KIBPs) have, in contrast to this ‘classical’ definition of BPs, some specific characteristics (Gronau, 2005), as shown in Table 6:

Table 6 Characteristics of BPs in KIBS

Characteristics of BPs in KIBS
1. In knowledge-intensive BPs, knowledge contributes significantly to the values added within the process.
2. People within a knowledge-intensive BP have large scope in the freedom of decision, they can decide autonomously.
3. The event flow of KIBPs is not clear in advance, as it can evolve during the process.
4. In KIBPs, the participants in the process have different experiences and bring in knowledge from different domains and at different levels of expertise.
5. The life-time of knowledge involved in KIBPs is often very short and knowledge is out-dated very quickly. It is usually very time-intensive to build up this knowledge.
6. IT support for KIBPs is generally not very sophisticated because it strongly relies on socialisation and informal exchange of knowledge.
7. A knowledge-intensive BP should be a core process of the company and it should produce or add new knowledge to the organisation's knowledge base.
8. Often the costs of KIBPs are very high.

Source: Gronau (2005)

Garvin (1993) argues that business processes are the focus of re-engineering efforts. Definitions of business process management (BPM) range from ICT-focused views to BPM as a holistic management practice (Roseman and Bruin, 2006). The ICT-focused definition characterises BPM from the perspective of business process automation (Harmon, 2003). Roseman and Bruin (2006) argue that BPM often focuses on analysing and improving processes. Armistead and Pritchard (1999) see BPM as a holistic approach to the way in which organisations are managed. Armistead (1999) state that BPM is concerned with managing BPs on an ongoing basis and not just with the one-off radical changes associated with BPR. However, one can find further authors with many definitions of BPM and variations on these terms; for example, 'core process redesign' (Kaplan and Murdoch, 1991), 'process innovation' (Davenport and Short, 1990) and 'business process transformation' (Burke and Peppard, 1995).

Looking at the criteria of BPs in KIBS (see Table 6), one can conclude that, in KIBPs:

1. An improvement through conventional methods of business reengineering is not, or only partially, possible (Remus, 2002).
2. Value can only be created through the fulfilment of the knowledge requirements of the process participants (Davenport, 1993).

In the last few years, business process-oriented knowledge management (BOKM) has emerged in the scientific and practical fields (Gronau, 2005; Strohmaier, 2005). Both Gronau (2005) and Strohmaier (2005) argue that traditional business process management (BPM) concentrates mainly on the flow of work; thus, the integration of knowledge as a critical resource creates some potential benefits:

- Knowledge domains that are crucial for the execution of certain business processes become visible.
- Knowledge processes can be identified, managed and treated as separate important organisational processes.
- Knowledge deficits can be identified and remedied.
- Knowledge workers can be provided with the knowledge that is appropriate to their roles in their corresponding business processes.

BPOKM not only considers the business processes but uses the process-oriented view to describe the dynamic knowledge conversions between the process participants (Gronau, 2005). BPOKM, as a fusion of the fields of BPM and KM, proposes support for weakly-structured knowledge-intensive business processes.

Strohmaier (2005) distinguishes the following categories of BPOKM approaches that focus on:

- *Business process learning*, aiding knowledge workers in effectively building up knowledge and abilities needed in order to fulfil tasks in their corresponding business processes.
- *Business process support*, aiming to tackle identified challenges by providing instruments which aid knowledge workers in acquiring and organising relevant information that is critical to their business processes. Business process support

means that information needs, sources and channels are made explicit and documented.

- *Business process execution,* typically suggesting extensions to traditional workflow management systems. Business process execution aids process agents in executing their assigned tasks. Such approaches ensure that knowledge is provided, treated and documented according to organisational guidelines in an organisation's business processes.
- *Business process improvement* typically aims at redesigning BPs with a focus on improving organisational knowledge flows and on utilisation of new instruments from KM to improve the BP. These efforts improve the BPs as well as the knowledge processes and thus help to fulfil an organisation's overall business goals to a higher degree.

As this research is addressing the improvement aspects of BPs, the notion of knowledge-based BPI as a class of BPM is discussed in more detail.

2.3.6 Business Process Improvement (BPI)

Generally, BPI is the process by which gradual improvements are introduced over time. It aims to make business efficient, effective and flexible so as to meet expectations and some definitions of BPI are:

- The evaluation of alternative ideas and the movement of the organisation regarding BPs (Rosemann and Bruin, 2004).
- An incremental bottom-up enhancement of existing processes within functional borders (Davenport, 1993).

A characteristic of BPI, which distinguishes it from other BPM approaches, is that it is more a single-process change activity. Thus, one can argue that BPI is a process modification step instead of a continuous BP management approach.

Many methods for BPI have been proposed (Harmon, 2003; Whitten et al., 2004), such as: TQM, ABC, the ISO 9000 family of standards, and the SixSigma methodology. Harrington (1991) argues that, in general, there are three types of BPI methodology:

- *Benchmarking methodology* provides information about how benchmarked processes are performed in other organisations and thus allows one to compare one's own processes with the external benchmarks.
- *New process design* (process innovation) refines the present process using tools with a high degree of personal creativity to make a new process as efficient as it possibly can be. New process design is also referred to as big picture analysis, process innovation and process breakthrough analysis.
- *Process redesign* is directed at improving processes in the form of making them more effective, efficient, and adaptable. It is sometimes referred to as focused improvement or process re-engineering. The methodology starts with:
  - Understanding the present process typically by flowcharting it, doing process walk-through, collecting cycle time, assembling cost data by activity and;
  - Improving the process: by, for example, bureaucracy elimination, duplication elimination, simplification, process cycle-time reduction and error-proofing.

However, in the context of BPM and BPI, researchers such as Dalmaris (2006), Strohmaier (2005), and Remus (2002) argue that knowledge and human performance issues are most often not taken into account and that, from the traditional BPI methodologies, no methodology is found that would explicitly support the improvement of a BP through improvement of the way that knowledge is managed.

This finding indicates a gap in knowledge in this area and leads to the opportunity for a knowledge-based BPI approach.

2.4 The Research Gap

Despite the fact that this is a relatively young research domain, one can identify some approaches that focus on KBBPI and have proved themselves successful in the past (Strohmaier, 2005; Dalmaris, 2006). Nevertheless, several authors, such as Dalmaris (2006), Strohmaier (2005), Gronau (2005) and Remus (2002), argue in this context that knowledge and human performance issues are most often not taken into account, which indicates a relevant knowledge gap in the field:

- Publications in this field do not refer to a particular epistemology or they are based on an under-developed epistemology (Hall, 2005; Dalmaris, 2006). Thus, they fail to create a systematic approach or framework for KBBPI.
- Dalmaris (2006) confirms that the methodologies developed for KBBPI are loosely defined and, more specifically, it seems that there is no framework or methodology that assumes knowledge as the focal point of BPI.

Furthermore, no publication has been found that would integrate the NGKM, the most contemporary and innovative approach, from Firestone and McElroy (2003) with BPI.

The main issue is that business process management (BPM) research and practice is still highly focused on structured, operational BPs and, as shown earlier, there is a need to better understand the knowledge aspect of BPs. That means the key ingredient of knowledge-intensive BPs is human knowledge in the form of experience and creativity that cannot be standardised, prescribed and easily acquired. Consequently, in this approach, the management of BPs is still the focus but from a KM perspective. Marjanovic and Seethamraju (2008) similarly argues that organisations are starting to shift their focus of BPM from operational business processes to knowledge-intensive BPs that cannot be easily replicated, in order to create new opportunities for competitive differentiation. Such approaches are expected to lead to new KM strategies designed to better leverage human capital and ensure continuous improvement of business processes (Marjanovic and Seethamraju, 2008). Thus, it is relevant to fill the research gap regarding a comprehensive approach that would provide a detailed framework on how to improve knowledge-intensive BPs from a KM perspective.

Based on the above considerations, one can conclude that a KBBPI framework with a robust theoretical foundation and an explicit methodology is of interest for researchers and practitioners.

This research addresses the knowledge-intensive BPs in a small management consultancy and illustrates how the research findings expand current BPM boundaries, especially in the area of BP improvement methodologies.

2.5 Summary

This chapter achieved the aim of identifying the research gap in the field and validated the research problem with a thorough review of relevant literature. The review of literature started with investigating management consultancies and identifying knowledge intensity as one of their main characteristics. These findings led to the literature on knowledge-intensive business services (KIBS).

One of the common characteristics of KIBS is the knowledge intensity (Section 2.1.2), and knowledge in KIBS and management consultancies (as one representative of a typical KIBS) is a key production factor. Knowledge is generally recognised as an organisational and commercial variable and the value of knowledge for organisational success is well documented (Section 2.1.3). Knowledge in KIBS is assessed to be the most strategically significant resource of the firm and literature showed that the resource-based view of firms caused the formulation of different perspectives on knowledge resources (Section 2.1.4). Although literature provides many definitions of knowledge, there is still no generally accepted definition of knowledge. From the many definitions in literature, given the focus on business process and action, knowledge is defined for this research as: *Knowledge is guiding in action and is linked to a superior ability to solve problems.*

All organisations, especially KIBS, have to manage knowledge and extant literature identifies several themes of KM evolution. Due its focus on BPs, the two KM generations proposed by Firestone and McElroy (2003) are identified to be relevant for this research. They distinguish between the first generation KM (FGKM) and the new generation KM (NGKM). A central notion is that, while practitioners of FGKM tend to begin with the rather convenient assumption that valuable knowledge already exists, practitioners of NGKM do not. The key idea in NGKM is that knowledge is embedded in and becomes constructed in collective practices. A central element in NGKM is the Knowledge Life Cycle (KLC), which is founded on the idea that knowledge is created in response to organisational need, transferred or shared among organisational agents, and then used in decision making. The most important consequence for this research from the NGKM is the distinction between KM and knowledge processing. This implies that KM does not directly manage knowledge outcomes but impacts knowledge processes, which in turn impact the outcomes of business processes. Thus, one can distinguish three tiers in the NGKM, (see Figure 5)

a) BPs use knowledge but do not produce or integrate it.
b) KPs represent the knowledge production.
c) KMPs represent the KM in the NGKM from Firestone and McElroy (2003).

These considerations led to the discussion (Section 2.4) of business process-oriented knowledge management (BPOKM), as a fusion of the fields of BP management and KM, and proposed support for weakly-structured knowledge-intensive business processes. BPOKM not only considers the business processes but also uses the process-oriented view to describe the dynamic knowledge conversions between the process participants. In the field of BPOKM, one can distinguish several different approaches and one of them is knowledge-based business process improvement (KBBPI), typically aimed at using KM to improve BPs.

Several authors argue in the context of KBPPI that knowledge and human performance issues are often not taken into account and thus indicate a research gap in the field (see section 2.4).

The literature review confirmed the project aim that there is a need to fill the research gap regarding a comprehensive approach that would provide detailed instructions on how to improve knowledge-intensive BPs from a KM perspective.

Chapter 3

Methodology and Methods

The objective in this chapter is to determine a methodology to address the research gap. Sometimes, in disciplines such as computer science, engineering and medicine, assumptions on methodology are not explicitly stated. In such cases, the given scientific community has reached consensus on what methodologies it considers to be appropriate and on working assumptions that underpin the research. However, the diversity of research approaches regarding KM identified in literature indicates that KM is an inherently interdisciplinary research field and, thus, a specific research methodology is required. Methodology is itself a term which provokes debate. What the term 'methodology' means to a research, as well as the importance assigned to the study of methodology, varies across research disciplines. Miles and Huberman (1994) see research methodology as a research design for data collection and data analysis. Leedy (1993) broadens Miles and Huberman's definition and states, "*A methodology is a strategic framework for action within which the 'facts' are placed so that their meaning may be seen more clearly and that serves as a bridge between research questions and the execution or implementation of the research.*"

The main objective of a methodology in research is to provide a sound and systematic basis for research conclusions, meaning that if somebody else conducted the research, then they would be expected to reach the same conclusions. Lehaney and Vinten (1994) carried out a review on how the word 'methodology' has been used in various research papers. From their review, they identify six definitions of research methodology (Lehaney and Vinten, 1994):

- The ways in which hypotheses become theories – scientific methodology.
- The ways in which techniques are chosen to address a particular problem.
- The ways in which problems are chosen, which addresses the question of sponsorship.
- Methods or techniques.
- The modelling process, which includes hard and soft systems approaches, the ways in which the relevant variables are chosen for a model and how reality is

concomitantly simplified.

- The chronological planning of events – the research programme.

Leedy (1993) further defines research as “the systematic process of collecting and analysing information (data) in order to increase our understanding of the phenomenon about which we are concerned or interested”. This definition corresponds firmly with the aim (Section 1.3) of this research. The next sections will consider which research methodology is most appropriate.

3.1 The Research Stance/Philosophy

A research study is undertaken within certain assumptions. It is therefore important that researchers state the paradigmatic assumptions underlying their research so that the reader can establish an overview of their position.

Research is always founded on specific assumptions regarding epistemology and ontology. Different classifications of epistemological assumptions exist (Lincoln and Guba, 2000). In the interpretation of von Krogh and Roos, epistemology “… is concerned with understanding the origin, nature and validity of knowledge; it seeks to provide knowledge about knowledge” (von Krogh and Roos, 1995). There are two prominent epistemological extremes of positivism and constructionism. Positivism means that reality is a logical construct, whilst social constructionism suggests that reality is in the interpretation - each actor has a different view and their basis for that interpretation changes over time and with context. However, an important epistemological argument is that of comparison. Positivism allows a comparison of logical constructs through experiment and observation. In contrast, strong constructionism rejects any rational basis for the comparison of concepts; since all knowledge is interpretation, there can be no rational basis for comparison. The discussion of which epistemological stance could be adopted in this research is discussed in the following paragraphs.

Miles and Huberman (1994) define the concept paradigm as a cluster of beliefs that influence what should be studied, how research should be conducted and how the results should be interpreted. According to Myers and Avison (2002), three paradigms are prominent in contemporary social research - positivism, interpretivism and critical research. These three research epistemologies are philosophically distinct (as ideal types) in the practice of social research (Lee, 1998).

A brief overview of these philosophical assumptions is presented below.

3.1.1 Positivism

Positivism is a doctrine that claims social life should be understood and analysed in the same way that scientists study the natural world. Research can be considered positivist if there is evidence of formal propositions, quantifiable measures of variables, hypothesis testing and deducing the inferences concerning the phenomena from the representative sample to a stated population (Orlikowski and Baroudi, 1991).

This position assumes that knowledge stems from experience and observation and that observational data have to be verified through the senses. Verification, in this view, leads to (scientific) knowledge. Positivism asserts that knowledge and truth are questions of correspondence in that they relate to an external referent reality. This correspondence theory of truth stipulates that the source of truth is in reality; therefore, a statement is proved to be true if it agrees with an independently existing reality and is false if it does not (Kim et al., 2003). The author further argues that generated knowledge is thought to constitute an accurate description of reality and becomes accepted as truth through this rigorous empirical verification process (Kim et al., 2003). In this sense, positivist studies generally attempt to test theory and to increase the predictive understanding of phenomena.

Historically, positivism has been criticised for its universalism, contending that all processes are reducible to physiological, physical or chemical events (Asley and Orenstein, 2005). Similarly, social processes are reducible to relationships between and actions of individuals and biological organisms are reducible to physical systems (Asley and Orenstein, 2005).

The first critique is that positivism ignores the role of the observer in the constitution of social reality and thereby fails to consider the historical and social conditions (Bryman, 1984). A second critique is that positivism ignores subjective experience or meaning to the participants (Bryman, 1984).

Critiques of positivism, especially from philosophy of science, have led to the development of post-positivism. Post-positivism accepts the critique that observation is always value-laden but argues that the best values to adopt are those of science scepticism, which are rigor and modesty (Bryman, 1984).

3.1.2 Interpretive Research

In interpretive research there are no predefined dependent and independent variables but a focus on the complexity of human sense-making as the situation emerges (Kaplan and Maxwell, 1992). In the interpretive approach, social phenomena must be understood in the social contexts in which they are constructed and then reproduced through their activities. Interpretive approaches to research are “aimed at producing an understanding of the context and the process whereby the subject influences and is influenced by the context” (Walsham, 1993). Burrell and Morgan (1979) argue that, in the interpretive stance, social reality is constructed as a result of intentional actions. The epistemological stance on interpretive approaches is that knowledge of reality is gained only through social constructions, such as language, shared meanings, tools, documents, etc. (Walsham, 1993). Consequently, interpretive approaches give the research greater scope to address issues of influence and impact and to ask questions such as ‘why?’ and ‘how?’ (Boland and Collopy, 1991; Orlikowski and Baroudi, 1991; Deetz, 1996). Interpretive research generally attempts to understand phenomena through the meanings people assign to them and focuses on the full complexity of human sense-making as the situation emerges.

3.1.3 Critical Research

Research may be categorised as critical if its main task is seen as being one of social critique, whereby the restrictive and alienating conditions of the *status quo* are brought to light (Klein and Myers, 1999).

Critical research assumes that people can consciously act to change their social and economic conditions; furthermore, social reality is historically constituted and produced and reproduced by people. As mentioned above, critical research has important characteristics, which are summarised below.

- A problem is identified and addressed, which finally results in change.
- People are essential for successful critical research because people articulate their

experiences and contextualise them on the basis of previous experiences. These are important for change and critical research in terms of how they critique their experiences.

- The nature of critical research provides opportunities for examining synergies and contradictions, which are important for triangulation in research.

Moreover, the goal of critical research is to identify what does not work well and to improve on it. Thus, the forms of critical research, such as action research and participatory or praxis research, are useful when there is a need not only to understand a particular situation but also to do something about it (Street, 1995). Early forms of critical research were based on the premise that groups of people, who share a common concern, could investigate and make rational choices to improve their situation (Street, 1995). This understanding and action component of critical research fits well with this research because the aim of this research is to assess a situation and take action to improve it. However, critical research is not able to be generalised but uncovers issues which may be generalised to others in similar situations (Street, 1995).

3.2 Selection of an Appropriate Research Approach

Following the above brief discussion of different philosophical assumptions, this section presents a justification for positioning itself in the context of the above perspectives.

Klein and Myers (1999) indicate that quantitative methods have been used in interpretive or critical research because qualitative methods have been used in positivist research. It is often assumed that positivism and quantitative methods go together and are one and the same thing because the basic beliefs of a positivist or quantitative researcher lead them to perceive the world as external and objective and science as value-free. The quantitative approach is, by definition, concerned with the quantity of entities and is appropriate to quantifying relationships between variables of interest, in order to formulate and test hypotheses on the basis of comparative and statistical analyses (Black, 1999). The quantitative approach is deductive, which means the research work begins with a general theory and ends with specific observations. In deductive methodologies, the researcher determines in advance what theories could explain the data. The quantitative approach involves collecting objective or numerical data that can be charted, graphed, tabulated and analysed using statistical methods. However, there are several drawbacks to using a quantitative approach, as some researchers indicate. They argue that the quantitative approach ignores human individuality and people's unique ability to think, to interpret their experiences, to construct their own meanings and to act on these (Burns, 1997). Similarly, Kaplan and Maxwell (1992) argue that the goal of understanding a phenomenon from the point of view of the participants and its particular social and institutional context is largely lost when textual data are quantified.

Qualitative research is designed to help researchers understand people and the social and cultural contexts. This means that the researcher acknowledges the subjective nature of the study, taking into account values, norms, beliefs and motives in an attempt to remain as true as possible to the situation being researched (Caelli et al., 2003). The qualitative approach aims to capture the multiplicity of perspectives of social actors and the meanings that those actors assign to events. It is characterised by an emphasis on the collection and analysis of non-numerical data and concentrates on investigating subjective data. Qualitative researchers operate from a subjective, participant standpoint from which their research is completed in collaboration with their subjects, bearing in mind the impact of their own beliefs, values, motivations and history, as well as those of their subjects (Caelli et al., 2003; Denzin and Lincoln, 1998). The strengths of qualitative research derive primarily from its inductive approach, its focus on specific situations or people and its emphasis on words rather than numbers (Maxwell, 1992).

This research relates at least to two research fields, namely KM and BPI. KM, as well as BPI research, can generally fall under both categories of positivism and constructionism. One research stream in KM draws predominantly on findings from the fields of computer science and information systems (Giaglis, 2002). In contrast, a separate research stream approaches the same kinds of problems from a complementary perspective and attempts to tackle the managerial, organisational, and human issues surrounding the successful introduction of KM within organisations (Giaglis, 2002). Thus, one can identify both paradigms in the field of KM. BPI is comparable since the origins of business process engineering relate to measurement and, thus, to a quantitative approach. Other BPI approaches focus on teams and human interaction and, thus, on anti-positivistic research. Thus, this research could be positioned within the positivistic, as well as anti-positivistic discourses.

In the context of this research, choosing a positivistic stance would lead to an approach that implies formal propositions, quantifiable measures of variables, hypothesis testing and deducing the inferences concerning the phenomena from the representative sample to a stated population (Orlikowski and Baroudi, 1991). In such an approach, the starting point would be to develop a preliminary conceptual framework, which would be tested, improved, elaborated and validated. The key question would be: “Which variables promote or inhibit the framework?”

Although, this approach would have the advantage of generating potentially generalisable knowledge, the disadvantage would be that, in order to evaluate the impacts of KM, implementation to organisational performance is considered to be very critical (Kim et al., 2003). Kim et al. (2003) addresses that demonstrating the direct correlation between KM and organisational performance is quite complicated to evaluate since KM may not be the only factor affecting the organisation’s performance.

However, the starting point of this research is a practice problem and the lack of a model in the organisation, which would help to guide KM initiatives. This research should contribute theory and practice; thus, the idea in this study is to try out a tentative solution in the work practice, gain feedback from this experience, modify the theory as a result of this feedback and to try it again. The form of feedback indicates that this research is neither positivistic nor quantitative because feedback is gained through the meanings from people.

The salient difference between interpretative and critical approaches is the outcome. For critical research it is social change, while interpretive research aims at understanding the meaning people attach to social actions (Reeves, 1996). Thus, this research is interpretive and not critical because the focus is not on change as in critical research. This research study follows the interpretive paradigm because the evaluation of the framework is an inter-subjective social construct with multiple views (Reeves, 1996). The evaluation is essentially a relative term that can only be understood from the point of view of the stakeholders. Consequently, this research must be qualitative because it aims to capture the multiplicity of perspectives of social actors and the meanings that those actors assign to events. It is characterised by an emphasis on the collection and analysis of non-numerical data and concentrates on investigating subjective data.

3.2.1 An Interpretative Case Study with an Action Research Approach

As discussed, the aim of this research is to design and evaluate a framework. The involved actors from practice are of vital importance because the researcher's understanding of the studied phenomenon is created through the meanings that these actors associate with it (Orlikowski and Baroudi, 1991).

The aim of this research does not correspond with critical research mainly aimed to empower and emancipate those who are the focus of the research (Alvesson and Deetz, 1996; Fontana and Frey, 2000). According to Alvesson and Deetz (2000), the main aim of critical research is transformation of practices (change) but this is not a main objective of this research.

The aim of this research corresponds with the aim of an interpretive case study because interpretative research seeks to perceive, describe, analyse and interpret a specific situation (Burrell and Morgan, 1979; Deetz, 1996; Kan, 2010; Walsham, 1993).

These considerations are leading to the conclusion that an interpretive case study is the best way to approach the aim of this research. Thus, this research can be broadly described as an interpretive case study aimed at tracing assumptions, interpretations and problems of involved actors (Klein and Myers, 1999; Walsham, 1993).

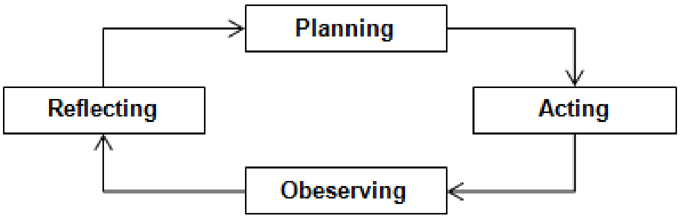
3.2.1.1 Case Study

A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 1994). A case study is a widely accepted research strategy because case studies provide the main vehicle for research in the interpretive tradition (Walsham, 1993). A case study strategy has been argued to be particularly useful for practice-based problems, where the experience of the actors is important and the context of action is critical (Lee, 1998; Galliers and Newell, 2001). Paré and Yin (1994), as well as Orlikowski and Baroudi (1991), provide similar reasons to suggest why the case research approach is useful. One can conclude that a case study examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organisations). Thus, an interpretive case study is well-suited to capture the knowledge of practitioners and develop theories from it (Käkölä, 1991). A case study where there is (almost) no intervention from the researcher can be classified as an observation. A case study characterised by planned and deliberate changes to the organisation under study can be classified as action research (Argyris and Schön 1978). Action research aims to contribute to solving practical problems of an organisation and achieve scientific results by joint collaboration between an organisation and the researcher (Rapoport, 1970).

3.2.1.2 Action Research

Kurt Lewin, a German social psychologist, has been credited with the development of the idea of action research (1946). He first found that experimental methods, in many cases, were inadequate and unsatisfactory. He then tried to find a method that based on people's real-world experience; from that time on, action research has entered the world of researchers. According to Lewin (1946), action research (AR) is "a comparative research on the conditions and effects of various forms of social action and research leading to social action"; this type of research uses "a spiral step," each of which is "composed of a circle of planning, action and fact-finding about the result of the action".

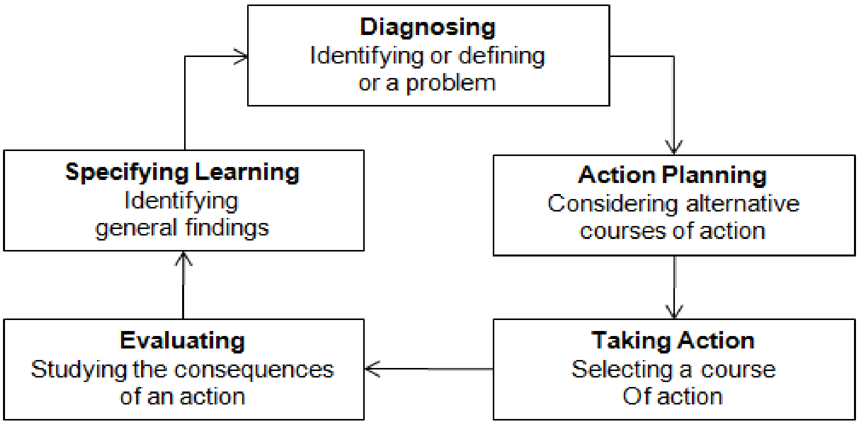
Figure 6. Steps of AR



Source: Lewin (1946)

Thus, in Figure 6, an intervention is planned, the corresponding action is taken, something is observed and critical analysis of the results (reflection) is carried out, which leads to adjustments that lead to subsequent cycles. Some authors propose more detailed cycles; for example, Baskerville (1999) and Baskerville and Wood-Harper (1996). One of the most prevalent approaches is that proposed by Susman and Evered (1978), which includes five phases (Figure 7).

Figure 7. A Cyclical Process of AR


Diagnosing
Identifying or defining
or a problem
Action Planning
Considering alternative
courses of action
Taking Action
Selecting a course
Of action
Evaluating
Studying the consequences
of an action
Specifying Learning
Identifying
general findings

Source: Susman and Evered (1978)

The basic sequence of action-research expressed in ‘planning, action, observation and reflection’ gives way, in the model of Susman and Evered (1978):

1. *Diagnosing*: identification of the problematic situation. Involves interpretation of a complex problem, not through reduction and simplification but rather in a holistic fashion. A first theoretical solution will stem from this step.

2. *Action planning*: specification of the actions to adopt in order to solve or relieve the problematic situation. The previously established theoretical solution plays an important role in the identification of the actions to take.

3. *Action taking*: implementation of the devised actions, causing change to occur and, in principle, leading to an improved situation.

4. *Evaluating*: assessment of the outcomes of the actions taken after completion of the previous step. This involves a critical analysis of the results in light of the theoretical solution and of the practical effects that were achieved.

5. *Specifying learning*: identification and description of findings based on the information resulting from the previous step; thus, adding to the body of knowledge on the subject. Although, from a formal point of view, this stage appears last, it is indeed a permanent activity.

In Susman and Evered's (1978) understanding, AR aims to contribute both to the practical concerns of people in an immediate problematic situation and to the goals of social science by joint collaboration within a mutually acceptable framework.

From literature, one can identify different types of AR; for example, Kemmis and McTaggart (2000) distinguish:

- *Participatory research* stresses the shared ownership of research projects, the community-based analysis of social problems, and an orientation towards community action.
- *Critical action research* with a strong commitment to participation, empowerment, and the fight against injustice.
- *Action learning* aiming to bring people together to learn from each other, while *action science* tries to help professionals analyse the gap between their espoused theory and their theory in use.
- In *soft system approaches*, the researcher works with participants to generate system models of the situation and uses models to question the situation and suggest revised courses of action.

From a different point of view, Cresswell (2003) argues that there are two main types of action research, which are "participatory AR" and "practical AR".

- Participatory AR is usually implemented on a larger scale to improve "the quality of people's organisation, communities". Namely, it has a "social and community orientation" and it focuses on research that "contributes to emancipation or change in our society". Practical AR is used in situations in which researchers "seek to enhance the practice through the systematic study of a local problem." It usually involves a small-case research project that is narrowly directed at a specific problem or issue and is undertaken by individuals or teams within a particular setting.

- Practical AR fosters the improvements in professional practices by emphasising the part played by personal judgement in decisions to act for the good of the client. Correspondingly, Avison et al. (1999) state that AR, as a qualitative research method, is unique in the way it associates research and practice; therefore, research informs practice and practice informs research synergistically. As is the case in this research, the researcher wants to try out a theory in AR with practitioners in real situations, gain feedback from this experience, modify the theory as a result of this feedback and try it again.

Researcher and practice profit much from action research. Gay and Airasian (2003) prove benefits resulted from the application of action research as follows:

- Researchers investigate their own practice in new ways and develop a deeper understanding of practice.
- Professional development and improvement are core aspects for any researcher engaging in action research.
- Researchers are viewed as equal partners in deciding what works best and what needs improvement in their practice and, in most cases, solutions for identified problems are arrived at cooperatively.
- Researcher reflection can be conducted individually or in a team composed of researchers and practitioners.
- Researchers operating as practitioners are often more committed because they identify the areas they view as problematical and in need of change.

An important advantage of AR is that the researcher is part of the research and is in a better position to tap into contextualised, rich data that could be from several perspectives simultaneously. In this way, the researcher is able to fully appreciate the context, language and history of the experience in this research.

So far, one can conclude that this research study is an interpretative case study with an action research approach.

3.3 Design-Based Research

Design-based research (DBR) has been proposed as a methodology that can help bridge the gap between research and practice (Andriessen, 2006). According to Collins et al. (2004), the term 'design experiments' was introduced in 1992 in articles by Brown (1992) and Collins et al. (2004). Design experiments were developed as a way to carry out formative research, to test and refine designs (originally in education) based on principles derived from prior research. According to Sandoval (2004), DBR is about intervention: when it works, how it works and for whom it works. Wang and Hannafin (2004) suggest the following definition for DBR: *DBR is a research methodology aimed to improve practices through systematic, flexible, and iterative review, analysis, design, development, and implementation, based upon collaboration among researchers and practitioners in real-world settings and leading to design principles or theories.*

DBR aims to create prescriptive knowledge in order to improve professional practice (Andriessen, 2006). From this view, DBR should contribute to practice in the form of general solutions for real world problems (Van Aken, 2004) and DBR should also contribute to theory by highlighting the generative mechanisms that make the solution concept work (Van Aken, 2004). The so-called generative mechanism is the answer to the question, "*Why does this intervention produce this outcome*?" (Van Aken, 2004). Oost (1999) argues that research problems can fall into five types, which are description, comparison, definition, evaluation and explanation problems. He further argues that, in DBR, the design problem *"How can one improve situation Z"* is not a separate type of research problem but a combination of an evaluation and an explanation problem and, thus, can be stated as:

- Explanation problem: "Can X cause Y?"
- Evaluation problem: "Is Y a good solution for Z?"

Accordingly, (Andriessen, 2006) suggests that DBR aims at providing answers to:

- An explanation problem: "*How can one improve a situation?"*
- An evaluation problem: "*What is a good solution for this problem?"*

Andriessen (2006) concludes that the above two questions are answered by three conceptual elements in DBR, namely:

1. The researcher acts like a ‘designer’ who uses existing knowledge about the way organisations work to create a ‘blueprint’ of a solution.
2. These solution concepts are like designs that consciously and explicitly have been ‘designed’ before they are used and that are ‘redesigned’ several times to improve them.
3. These designs are evaluated to check their validity.

Element 1 answers the question: “*How can we improve a situation?*” Elements 2 and 3 answer the question: “*What is a good solution for this problem?*” The relevance to this research subject is clear. Wang and Hannafin (2004) summarise the key ideas of DBR through five basic characteristics:

1. *Pragmatic research goal*: DBR refines both theory and practice; the value of theory is appraised by the extent to which their principles inform and improve practice.
2. *Grounded research methodology*: DBR is conducted in real-world contexts with social interaction. Before conducting DBR, researchers review literature and available design cases to identify gaps to ensure the value of the research.
3. *Interactive, iterative, and flexible research process:* The DBR process is characterised by an iterative cycle of design, enactment or implementation, analysis and redesign. Through this cycle, a theory will be gradually formed and updated based on the accumulated data collected in each design iteration as well as implementation experiences of the designer. The interactive, iterative and flexible research process also corresponds to timely factors in the local settings. In the DBR process, the researcher needs to balance the role as a designer and a researcher.
4. *Integrative research methods*: DBR researchers use mixed methods to maximise the credibility and adaptability of their methods.
5. *Contextual research results*: The results generated from DBR act as principles in the form of heuristic statements. The research process, research findings and any change from the initial plan are documented and some warrants or guidance on how to use these principles are also provided. Thus, other researchers or designers

> can trace the emergence of an innovation or combinations of innovations according to their interests; they also examine contexts or conditions that led to different effects.

The researcher concludes that the DBR methodology is appropriate for this research. The aim of this research (Section 1.3) corresponds to Andriessen's (2006) conceptual elements in DBR, namely; the researcher acts like a 'designer' using existing knowledge about the way organisations work to create a 'blueprint' of a solution and to evaluate it in order to check its validity.

3.3.1 Justifying the Choice of a DBR Methodology

In order to justify the choice of DBR in the given situation, Andriessen's (2006) three conceptual elements in DBR are compared with the objectives of this research (Section 1.3) and summarised in Table 7:

Table 7 Comparing Elements of the DBR Methodology

Reference relates to first row of what?	**Three Conceptual Elements of DBR** (Andriessen, 2006)	**This Research**
Type of problem	Design problem: How can one improve situation Z?	How can one improve BPI in KIBs?
DBR answers two questions Oost (1999)	1. An explanation problem: Can X cause Y? 2. An evaluation problem: Is Y a good solution for Z?	1. Is it true that the KBBPI framework leads to improvement of BPs in KIBs? 2. Is the KBBPI framework a good solution for KIBs?
Conceptual elements of DBR Andriessen (2006)	1. The researcher acts like a 'designer' using existing knowledge about the way organisations work to create a 'blueprint' of a solution. 2. These solution concepts are like designs that consciously and explicitly have been 'designed' before they are used and that are 'redesigned' several times to improve them. 3. These designs are evaluated to check their validity.	1. The objective "Determine a methodology to address the gap" means that the researcher is developing the KBBPI framework as a tentative solution. 2. The objective: "Apply the methodology for bridging the gap", means the researcher is evaluating the KBBPI framework in practice. 3. The researcher is improving the KBBPI framework based on the results from practice.

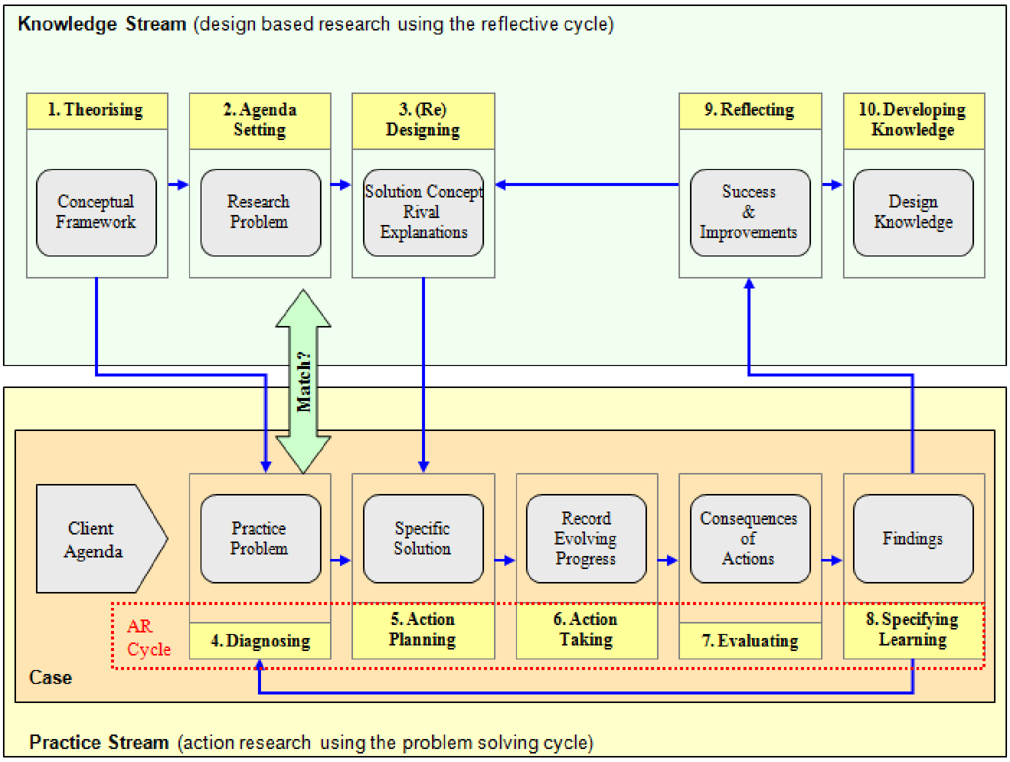
Referring to Table 7 and according to Andriessen's (2006) arguments, one can formulate the research problem in this study as a design problem. Following further on Oost's (1999) arguments, the research problem can be broken down into two components; namely, an explanation problem and an evaluation problem. Finally, Andriessen's (2006) three elements of DBR correspond to the objectives of this research.

The above considerations are leading to the conclusion that DBR is an appropriate methodology with which to address the research problem in this research study.

3.3.2 DBR with an Action Research Approach

Andriessen (2006) suggested a DBR methodology (Figure 8) with an action research approach that fits the aim to evaluate a solution concept.

Figure 8. Andriessen's DBR Methodology


Knowledge Stream (design based research using the reflective cycle)
1. Theorising
Conceptual Framework
2. Agenda Setting
Research Problem
3. (Re) Designing
Solution Concept Rival Explanations
9. Reflecting
Success & Improvements
10. Developing Knowledge
Design Knowledge
Match?
Client Agenda
Practice Problem
Specific Solution
Record Evolving Progress
Consequences of Actions
Findings
AR Cycle
4. Diagnosing
5. Action Planning
6. Action Taking
7. Evaluating
8. Specifying Learning
Case
Practice Stream (action research using the problem solving cycle)

Source: Andriessen (2006)

Andriessen (2006) argues that the dual purpose of design-based research is contributing to theory and practice, which materialises in two distinctive but interwoven streams of inquiry:

- The objective of the knowledge stream is to develop generalisable knowledge that can help create desired situations (Romme, 2003), preferably in a way that contributes to theory (Collins et al., 2004; Eden and Huxham, 1996).
- The objective of the practice stream is to contribute to the practical concerns of people in problematic situations, by solving particular problems in specific circumstances.

The corresponding steps, as suggested by Andriessen's (2006) DBR methodology, are:

1. *Theorising:* employing theory to develop a conceptual framework about the topic of interest.
2. *Agenda setting:* drawing on this framework to define a research problem that is phrased as a design problem.
3. *Designing and developing an initial solution concept by applying the design cycle*. The design cycle consists of four steps:
    a) Specifying the intended application domain that consists of the class of problems the solution concept needs to address and the class of contexts to which it should be applicable.
    b) Listing the requirements for the solution concept (functional requirements, operational requirements, limitations, and limiting conditions).
    c) Designing a draft solution concept.
    d) Evaluating the draft against the application domain and requirements.

In the following steps, the solution concept is tested in the practice stream and progressive refinement is applied to the design (Collins et al., 2004) using a developing case-study approach (Van Aken, 2004). The testing phase of the study starts with step four.

4. *Diagnosing* is a crucial phase in the practice stream. In this step, the practice problem is diagnosed. The problem of the case in the practice stream is different from the research problem in the knowledge stream. The practice problem is a problematisation of the situation in a particular case for which the solution concept is a possible solution. The practice problem calls for a

specific solution that can solve a particular problem, while the research problem asks for a solution concept that is applicable in a range of situations. At this stage, it is important to check whether the practice problem matches the application domain for which the solution concept is designed.

5. *Action planning*. In the case of action-planning, the phase involves identifying specific requirements and developing a specific design in a reflective conversation with the situation (Schön, 1983). The aim is to develop a tailor-made solution.
6. *Action taking*. In the action-taking phase, the specific design is implemented. During the implementation process, research data using interviews, participatory observation and document analysis is gathered.
7. *Evaluating* means to evaluate the process and outcome of the project with the client. Often it is useful to evaluate again after a considerate period of time, in order to assess the long-term impact of the solution concept.
8. *Specifying learning*. At the end of each case, the project to specify the lessons learned is evaluated.

The practice stream ends with step eight. In some cases, one needs to go back to steps four or five to change the diagnosis or alter the specific design. After step eight, it continues with the knowledge stream, reflecting on the implications of the case for the solution concept (step 9).

9. *Reflecting on the results* of a particular case using within–cases analysis (Eisenhardt, 1989) is conducted in terms of the success of the solution concept and the possibilities to improve it through redesign. Most cases lead to alterations of or additions to the solution concept. Often the redesign is tested in a subsequent case, except for the alterations that result from the last case.
10. *Developing knowledge* means doing a cross-case analysis (Eisenhardt, 1989) in order to analyse the indications and contra-indications of the solution concept.

Ideally, steps 3 to 10 are repeated several times, until the point of theoretical saturation is reached (Eisenhardt, 1989). A central element in Andriessen's (2006) DBR methodology is the incorporation of the case-study approach'.

3.4 The Adapted DBR Methodology

Andriessen (2006) suggests a multiple case study in DBR methodology. Replication within multiple case studies refers to the idea of obtaining more robust evidence through multiple experiments (Yin, 1994). Through using multiple-case study designs, it is possible to replicate the case and thus make use of the research evidence gained from cross-analysis of all the multiple cases. Despite their often-proposed more compelling evidence, multiple case studies can be difficult to conduct (Yin, 1994). Multiple case studies often require extensive resources and time beyond the means of an independent researcher. There might also be situations where the use of multiple cases is not possible, as several alternative cases may be difficult to locate and get access to, so that real cross-analysis could be made between them (Yin, 1994). Yin (1994) further argues that single case studies are appropriate in circumstances where, for example, the case represents a critical case for testing a well-formulated theory.

3.4.1 Justifying a Single Case DBR Methodology

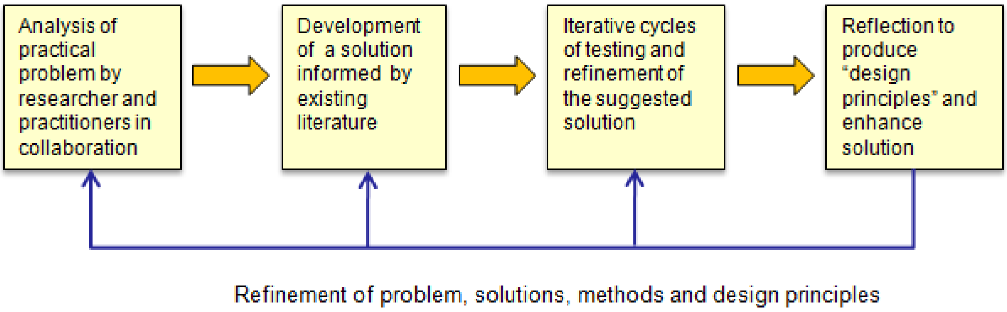
In contrast to the methodology suggested by Andriessen (2006), this research represents a single case study design. A single-case design is most applicable when the purpose of the research represents a very complex object to study and thus requires thorough analysis. According to Yin (1994), external conditions may influence a case remarkably, which means that, especially in conducting multiple case studies, these external variables may make replication and cross-analysis very difficult. A case approach using a well-elaborated single case enables the researcher to understand better the organisational setting and to become aware of the complexity (Yin, 1994).

In this research, the evaluation of the KBBPI framework represents a complex phenomenon. Therefore, choosing a single case design allows for taking a thorough and more holistic view of the case. The single case setting enables the research to concentrate more thoroughly on making sense of the various aspects of the case. Furthermore, this research is unique because it is concerned with the problem of developing and evaluating a framework in the context of a specific setting; namely, a smaller management consultancy. Thus, one can argue that it might be difficult or impossible to find further organisations with a comparable setting, willing to cooperate in a case study. Initial soundings with two small consultancies confirmed this assumption.

3.4.2 *Formulating a Single Case DBR Methodology*

Reeves (2006) argues for a single case DBR methodology:

Figure 9. Stages in DBR


Analysis of practical problem by researcher and practitioners in collaboration
Development of a solution informed by existing literature
Iterative cycles of testing and refinement of the suggested solution
Reflection to produce "design principles" and enhance solution
Refinement of problem, solutions, methods and design principles

Source: Reeves (2006)

He suggests the four conceptual elements showing in Figure 9 as follows:

1. *Analysis Phase*: analyse the research problem in collaboration with practitioners in the field.
   In this phase of the research, common themes in the literature are identified, which help to identify a knowledge gap and to confirm the need for this research.
2. *Design phase*: an initial design of a solution concept (the formulation of an initial design as a tentative solution to the problem).
3. *Evaluation phase*: evaluating and further developing the design. In this phase, the reflective cycle for evaluation is used.
4. *Improvement phase*: towards an improved solution concept (formulation of a validated design, the solution to the problem).

As discussed earlier, Andriessen (2006) uses multiple cases for validation of the results. In contrast, only a single case approach is feasible in this research due to the complexity and uniqueness of the evaluation. Thus, Reeves's (2006) methodology, a single case DBR approach, is the basis for this research. However, Reeves's (2006) methodology is not specifically enough focussed on the evaluation of a framework (using AR). Combining Andriessen's (2006) multiple case and action-research oriented DBR methodology with Reeves (2006) single case DBR methodology allows the formulation of a single case DBR methodology addressing that weakness. This is presented in Figure 10.

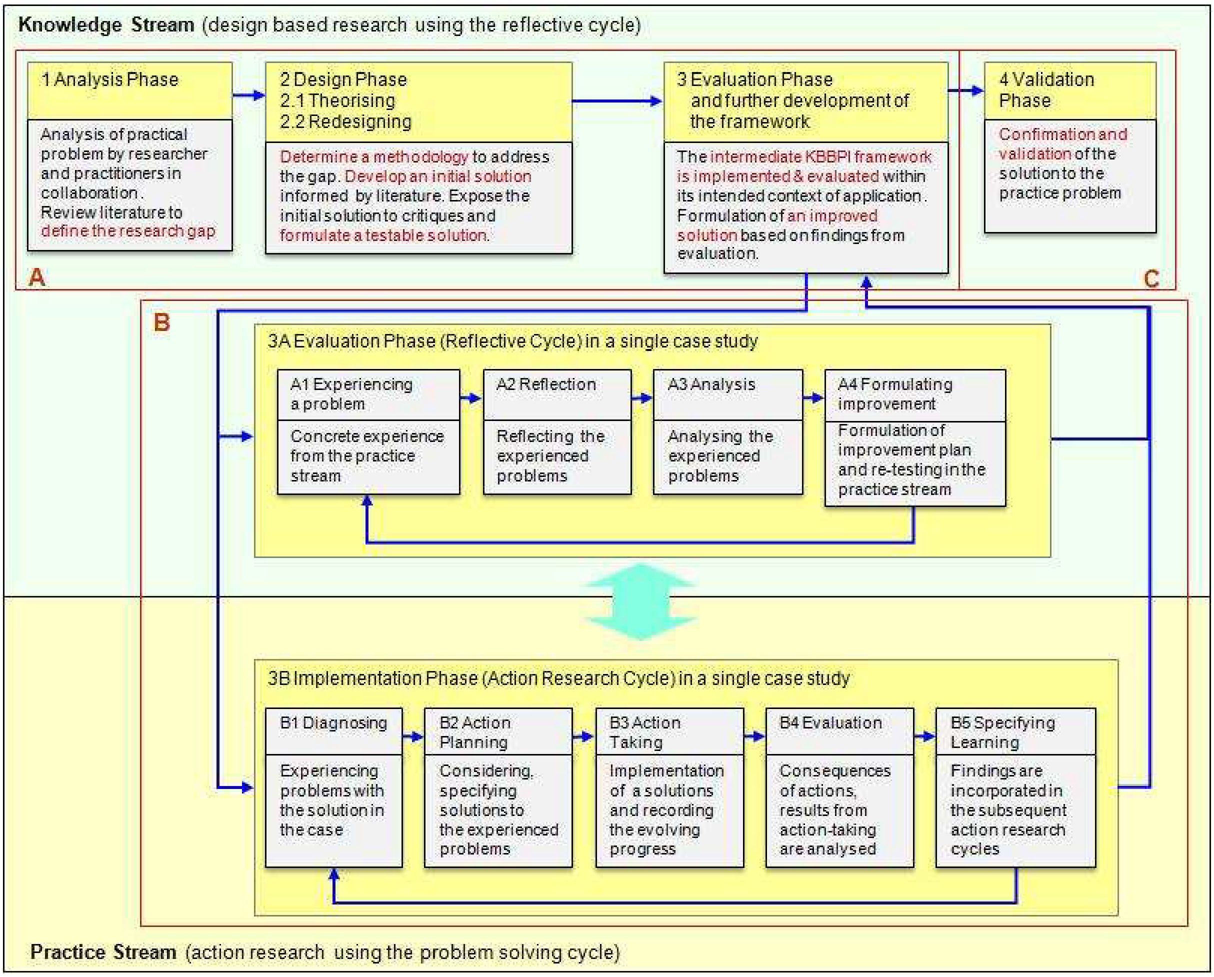
The four central elements from Reeves's (2006) methodology are to analyse the research problem, develop a design (an initial framework), and evaluate and improve it. These are represented in Figure 10 by the phases: "Analysis Phase", Design Phase", and "Evaluation Phase". These three elements are marked in Figure 10 with an "A". In Andriessen's (2006) methodology, the evaluation and improvement of a framework is an interlinked process (as discussed in sub section 3.3.2 and marked in Figure 10 with a "B"); the phases "Evaluation" and "Improvement" from Reeves's (2006) methodology are subsumed in one phase 3 (see Figure 10). The elements in Figure 10 marked with a "B" represent the knowledge and the practice from Andriessen's methodology, where the framework is implemented (practice stream) and evaluated (knowledge stream) and improved by using AR.

In Andriessen's (2006) multiple case study approach, the validation of the results is obtained through using multiple cases; therefore, validation evidence is gained from cross-analysis of those cases. Thus, a validation stage must be included (marked with a "C" in Figure 10) in order to gain validation evidence in this single case study through a reference panel (details are discussed in Chapter 8). However, additional elements must now be included in the new methodology, namely:

1. The analysis of the research problem, in terms of confirming its relevance, it requires not only discussions with practitioners and experts, as suggested by Andriessen (2006), but also an initial identification of the knowledge gap from literature.
2. Furthermore, the development of an appropriate research methodology for this research is based on a brought literature review.

This leads to a research process including the development of the KBBPI framework in four stages, as visualised in Figure 10 and discussed in the following sections.

Figure 10. The Applied DBR Methdology in this Research


Knowledge Stream (design based research using the reflective cycle)
1 Analysis Phase
Analysis of practical problem by researcher and practitioners in collaboration. Review literature to define the research gap
2 Design Phase
2.1 Theorising
2.2 Redesigning
Determine a methodology to address the gap. Develop an initial solution informed by literature. Expose the initial solution to critiques and formulate a testable solution.
3 Evaluation Phase and further development of the framework
The intermediate KBBPI framework is implemented & evaluated within its intended context of application. Formulation of an improved solution based on findings from evaluation.
4 Validation Phase
Confirmation and validation of the solution to the practice problem
A
B
C
3A Evaluation Phase (Reflective Cycle) in a single case study
A1 Experiencing a problem
Concrete experience from the practice stream
A2 Reflection
Reflecting the experienced problems
A3 Analysis
Analysing the experienced problems
A4 Formulating improvement
Formulation of improvement plan and re-testing in the practice stream
3B Implementation Phase (Action Research Cycle) in a single case study
B1 Diagnosing
Experiencing problems with the solution in the case
B2 Action Planning
Considering, specifying solutions to the experienced problems
B3 Action Taking
Implementation of a solutions and recording the evolving progress
B4 Evaluation
Consequences of actions, results from action-taking are analysed
B5 Specifying Learning
Findings are incorporated in the subsequent action research cycles
Practice Stream (action research using the problem solving cycle)

3.4.3 1. Analysis Phase

In an initial stage, a problem from the practice is identified and validated from practical experience and considerations of colleagues from practice, as well as from academia. The aim of this phase is to identify the knowledge gap in the field and to validate the research problem. This phase represents an initial literature review aimed at identifying a knowledge gap in the field corresponding to the practice problem. The identified knowledge gap provides some degree of reassurance to the researcher that the research problem is relevant.

3.4.4 "2. Design Phase", Proposing a Tentative Solution

The aim of this phase is to establish, on the basis of a literature review, the appropriate methodology to address the gap. Another aim is to formulate an initial tentative solution from literature to bridge the gap and to expose it to critique from experts. This phase consists of three steps:

1. An initial literature review laying the ground work for the research methodology.
2. A further literature review serves to build a thorough knowledge base for the topic and allows the formulation of the initial KBBPI framework.
3. This is followed by the first primary research "towards the intermediate KBBPI framework". In this research phase, the initial framework is exposed to critique and, based on the feedback, modified and extended. The objective is to translate the conceptual initial framework from literature into a testable solution to the practice problem, the intermediate KBBPI framework. Corresponding with the suggested DBR methodology, this consists of four steps (Andriessen, 2006):
    a) *Designing* the intermediate KBBPI framework, including the development of a methodology for implementation.
    b) *Specifying* the intended application domain of the KBBPI framework.
    c) *Listing* the requirements for the KBBPI framework.
    d) *Evaluating* the draft against the application domain and requirements.

The result from this research step is the intermediate KBBPI framework, which is tested in the next stage, the evaluation phase of this research.

3.4.5 "3. Evaluation Phase", Evaluation and Further Development of the Framework

In this second primary research phase, the intermediate KBBPI framework is implemented and evaluated in a practical setting and in the form of a single case study. The evaluation phase consists of:

1. Selection of the organisation and preparation for the case study. The aim of this step is to find organisations that fit the contexts and problems for which the KBBPI framework is designed, and are willing to apply it. The potential participants are informed about the purpose, the intended results and the practical

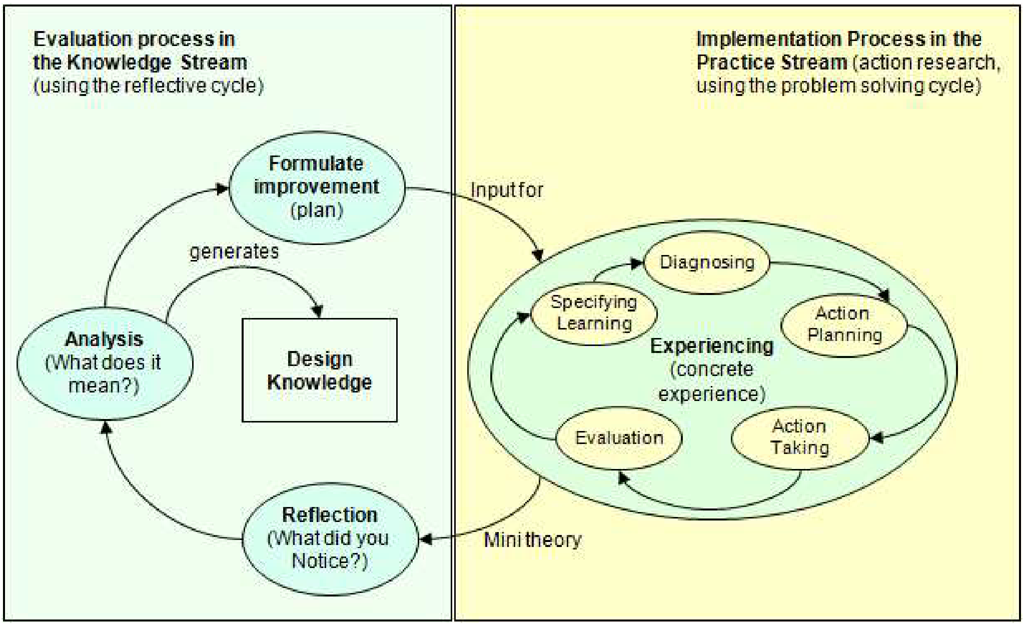
consequences.

The result of this step is to gain a strong indication that a specific number of organisations are suitable for the case study and are willing to participate. If an organisation seems to be suitable, the next step is to verify this assumption. Yin (2003) refers to this step as "screening case study nominations".

Finally, one organisation is chosen and a formal plan is made for applying the intermediate KBBPI framework. The result of this step is a specific plan for implementation of the intermediate KBBPI framework at the selected organisation.

2. The next phase includes two cyclic processes, the implementation and evaluation process of the KBBPI framework, which are executed in parallel. The DBR methodology (Andriessen, 2006) suggests that the reflective cycle in the knowledge stream is combined with the AR cycle in the practice stream, as visualised in Figure 10, in the following form:

Figure 11. The Reflective Cycle


Evaluation process in the Knowledge Stream
(using the reflective cycle)
Implementation Process in the Practice Stream (action research, using the problem solving cycle)
Formulate improvement (plan)
Input for
generates
Analysis (What does it mean?)
Design Knowledge
Reflection (What did you Notice?)
Mini theory
Diagnosing
Specifying Learning
Action Planning
Experiencing (concrete experience)
Evaluation
Action Taking

Source: Heusinkveld and Reijers, 2009

The right sector of Figure 11 above shows the implementation process of the KBBPI framework and is a cyclic process of action research, consisting of five iterative steps corresponding to the model of Susman and Evered (1978):

a) *Diagnosing* means identification of the problematic situation during implementation of the KBBPI framework and involves interpretation of the encountered problem. A first theoretical solution will stem from this step.
b) *Action planning* is the specification of actions to solve or relieve the problematic situation. The previously established theoretical solution (from the reflective cycle) plays an important role in the identification of the actions to take.
c) *Action taking* is the implementation of the tailor-made solution.
d) *Evaluation* is when the results of the action-taking phase are analysed by asking questions such as "What worked?", "What did not work?", "Why?", and "How can we do it differently next time?"
e) *Specifying learning* means that the findings from earlier steps are incorporated in subsequent action research cycles.

The output of the AR cycle entails a theory of practice or 'mini-theory' (Van Strien, 1997) that is only applicable in the individual situation. The researcher can derive more generalisable rules by systematically reflecting on them. Van Aken (2004) posited that through testing a rule by following a reflection process (the reflective cycle), one can gain insight into indications and contra-indications for successful applications of the rules.

The left sector of Figure 11 above shows the key elements of the reflection process (O'Neill, 2002):

a) The problem experience during implementation, the researcher has a "concrete experience".
b) The problem reflection.
c) The analysis and formulation of improvement.
d) The formulation of improvement in the light of the initial problem and conducting "active experimentation" to test out the newly developed principle.

The results of the reflection phase are used to plan the action of the next iteration and, finally, the KBBPI framework is improved in action.

The iterative processes continue until a satisfactory solution crystallises "that works well for the specified class of problems" (Hevner et al., 2004). Dewey (1933) emphasised that such phases "do not follow one another in a set order"; rather, in practice, some phases may be expanded, while others may be combined or even skipped.

Furthermore, this phase aims to reflect on the results from the case in terms of the success of the solution concept, the KBBPI framework and the possibilities to improve it through redesign. The results lead to alterations or additions to the KBBPI framework in order to formulate the final framework. The aim of this research is to generate, at least partially, generalisable transferable knowledge through the development and confirmation of the value of the KBBPI framework. The resulting "design knowledge" contains rules that are both grounded in theory and tested in the context of their application (Heusinkveld and Reijers, 2009). This means generating knowledge that can be used by others, than those involved in this research, for solving similar problems in similar contexts.

3.4.6 "4. Validation Phase"

Validation ensures that the integration framework is useful outside of the case. The objective is to establish that the KBBPI framework is suitable for its intended use. The KBBPI framework is validated by participants and experts on the field.

So far, the discussions in the prior sections have highlighted the considerations pertaining to determining a specific research methodology. The term 'research methodology' refers to the selection of methods that will be applied in a research project.

The aim of the next sub-chapter is to discuss the selection, justification, and application of data collection considered appropriate to the chosen research methodology. The next sub-chapter discusses:

- Common data collection methods in qualitative research.
- Justification for choosing specific data collection methods.
- Application of the chosen data collection methods in the case.

3.5 Data Collection Methods in Qualitative Research

Qualitative researchers typically rely on a range of methods for gathering information. Yin (2003) lists seven sources of evidence, which are physical artefacts, archival records, interviews, documentation, direct observation and participant-observation. Cresswell (2003) lists interviews, observation, document collection and open-ended surveys as sources of evidence. The most common data collection methods are, according to Morgan (1997), review of existing records, surveys, interviews, focus groups and observations. Archival records/document collections constitute secondary research, involving the summary, collation and synthesis of existing material. The other methods listed above constitute primary research, which is the collection of new data. This section provides a discussion of the primary and secondary methods to be considered in designing this research. Since it is the briefer topic, the discussion starts with secondary research.

3.5.1 Secondary Research

For every qualitative study, researchers supplement primary data collection with gathering and analysing documents produced in the course of everyday events. As such, minutes of meetings, internal reports, letters, company documents and so on are all useful to informing the inquiry. The secondary research in this study also includes literature review.

3.5.1.1 The Literature Review

The literature review concerns pre-existing information and knowledge, in particular relevant existing research. As well as preventing duplication of work and better defining the research gap[s] to be addressed, the literature is a source of prospective components for a solution to the research problem.

3.5.1.2 The Document Analysis

The analysis of existing material provides:

1) Added insight to inform the research.

2) A source of data for triangulation. Documents are a further source and thus help to get a rich picture and allow triangulation with data from primary research

(triangulation is discussed in more detail in section 3.1.9.3).

3) A basis for generating questions that can be pursued in direct observation, group discussion and interviewing (Patton, 1990).

3.5.2 Primary Research

From the primary data collection methods referred to at the start of section 3.1, the following are appropriate in this context:

- Observations.
- Surveys.
- Interviews.
- Group discussions.

3.5.2.1 Observations

Gorman and Clayton (2005) define observation studies as those that "involve the systematic recording of observable phenomena or behaviour in a natural setting". Other authors define observation within the broader context of ethnography or the narrower one of participation observation. The consistency in these definitions is the need to study and understand people within their natural environment. Becket and Geer (1970) define participant observation as an activity "in which the observer participates in the daily life of the people under study ... observing things that happen, listening to what is said, and questioning people, over some length of time". In order to observe people, there are a variety of potential roles for researchers. Gold (1958) presented a typology of four roles researchers can play in observations, including complete observer, observer-as-participant, participant-as-observer, and complete participant.

- *Complete observer*, involves almost no level of involvement with insiders; the researcher’s role is to listen and observe. One advantage of this role is that the researcher can remain completely detached from the group. The researcher cannot ask insiders any questions to "qualify what they have said, or to answer other questions his observations of them have brought to mind" (Gold, 1958). Given its limitations, Gold (1958) stated that this role may be an important starting point for future observations and interactions when the researcher assumes other roles.

- *Observer-as-participant*, this role, as described by Gold (1958), includes more observation than participation. In this role, the researcher should remain "strongly research oriented" and should not participate with the environment. Pearsall (1970) described two advantages to this role. Firstly, insiders may be more willing to talk to "attentive strangers" than they would be to talk to people with whom they are more familiar. Secondly, there is less "temptation either for the observer to go native or for the natives to try to include him permanently in their lives". The downside of this role is that the brief encounters with insiders limit "opportunities for gaining knowledge of total situations".
- *Participant-as-observer*; in this role, the researcher wants to "maintain a balance between being an insider and an outsider, between participation and observation" (Spradley, 1980). To accomplish this, the researcher interacts with the insiders and engages in similar activities. Spradley (1980) postulates two reasons for adopting this role. Firstly, the researcher may limit involvement in the group, fearing that it will affect the researcher's ability to interpret the data from a detached perspective. Secondly, the researcher may "intentionally restrict" the level of involvement because he/she does not want to participate in the specific activities of the insiders being studied. However, during this period of observation, the researcher may develop relationships with the insiders, such that they become "friends." Pearsall (1970) saw this relationship as beneficial because, as friends, the insiders can "instruct the investigator in the intricacies of their personal and social worlds". Gold (1958), on the other hand, viewed this relationship as more problematic. Firstly, he felt that the insider may identify too much with the researcher to continue in the role of informant and may become, instead, "too much of an observer". Secondly, the researcher may "over identify" with the insider, lose objectivity, and "go native"; thus, jeopardising her/his role as a researcher/observer.
- *Complete participation;* in this role, the researchers act as members. While this role is ideal for obtaining a very good understanding of the insiders, both Gold (1958) and Spradley (1980) had reservations about researchers engaging in complete participation. In this role, the identity of the complete participant is unknown to the insiders, which can be problematic for the researcher who may

become so self-conscious "about revealing his true self" that he/she becomes "handicapped when attempting to perform convincingly in the pretended role" (Gold, 1958). Furthermore, the researcher may feel that "he has so violated his observer role that it is almost impossible to report his findings" (Gold, 1958).

The adopted role depends on the problem to be studied, on the insiders' willingness to be studied and on the researcher's prior knowledge of or involvement in the insiders' world (McKechnie, 2000). Participant observation is also useful for gaining an understanding of the physical, social, cultural, and economic contexts in which study participants live; the relationships among and between people, contexts, ideas, norms, and events; and people's behaviours and activities – what they do, how frequently, and with whom (Bogdewic, 1992). In addition, the method enables researchers to develop a familiarity with the cultural milieu that will prove invaluable throughout the project. It provides a nuanced understanding of context that can come only from personal experience (Bogdewic, 1992). Patton (1990) summarises the following advantages of observations:

- Help better understanding and capture the context of the setting, enabling a more holistic perspective.
- Provide first-hand experience in a setting with less need to rely on prior conceptualisations.
- Allow seeing things that may routinely escape awareness among the people in the setting,
- Allow learning things that people would be unwilling to talk about in an interview.
- Open the opportunity to move beyond the selective perceptions of others.
- Allow drawing on personal knowledge during the formal interpretation stage of analysis.

Patton (1990) summarises the following disadvantages of observations:

- Are expensive and time consuming.
- Need well-qualified, highly trained observers, who may need to be content experts.
- May affect behaviour of participants.
- Selective perception of observer may distort data.

- Behaviour or set of behaviours observed may be atypical.

A major factor associated with observation is ethics. Observation is generally seen as the least intrusive data collection method; however, it can also be an abuse of an individual's privacy (Adler and Adler, 1994). The question concerns how far the researcher is obligated to inform people of research intentions. As Adler and Adler (1994) pointed out, the complete observer and observer-as-participant roles, as well as being covert roles in complete participation are problematic from an ethical point of view.

3.5.2.2 Surveys

At the early stage of this research, a survey was applied as a data collection method. A survey research is crucial when the researcher wants to get a general idea of the nature of public opinion (Hansen et al., 1999). In this context Wimmer and Dominick (1997) and Hansen et al. (1999) suggest that the key research instrument in a survey research is a survey questionnaire. A key advantage of using questionnaires is that their costs are reasonable considering the amount of information gathered (Neuman, 2000). However, they have the major disadvantage that inappropriate wording or improper placement of questions can bias results (Wimmer and Dominick, 1997).

In the early stage of this research, a questionnaire was intended to complement to subsequent observations and interviews. One advantage of a questionnaire survey compared with interviews is that it is easier to reach a relatively large number of respondents. In addition, questionnaires are more anonymous than interviews, can usually be filled in when it is convenient for the respondent and no interviewer bias is introduced. However, experience showed that a questionnaire survey is an inadequate data collection method for the intended evaluation of the framework. The results from a survey with 35 participants showed that the survey missed dealing with the context and thus delivered data that was not further usable in this research study. Thus in the following, the application of surveys as a data collection method is not further considered.

3.5.2.3 Interviews

Patton (1990) provided three types of qualitative interview:

a) *Standardised open-ended* interviews are based on open-ended questions and neither the wording nor the sequence of the questions on the interview protocol is varied to ensure the presentation is constant across participants. Participants are always asked identical questions but the questions are worded so that responses are open-ended (Borg and Gall, 2003). This open-endedness allows the participants to contribute as much detailed information as they desire and it also allows the researcher to ask probing questions as a means of follow-up (Patton, 1990). Nevertheless, standardised open-ended interviews are still regarded as a qualitative interview because the questions are open-ended. According to Borg and Gall (2003), this reduces researcher bias within the study, particularly when the interviewing process involves many participants. In particular, it is very useful when the interviewers are less experienced or knowledgeable or when it is important to compare the responses of different participants Patton (1990).

b) If one were to identify weaknesses with open-ended interviewing, they would likely identify the difficulty with coding the data (Cresswell, 2007) because it can be more difficult for researchers to extract similar themes or codes from the interview transcripts than it would be with less open-ended responses. Another negative aspect is that the interviewer has little flexibility to respond to the particular concerns of the respondent and there is little or no guarantee that the questions posed by the interviewee draw on the issues that are important to the particular respondent.

c) The *interview-guide approach* is less structured than the standardised open-ended interview because there is quite a bit of flexibility in its composition (Borg and Gall, 2003). The topics are pre-specified and listed on an interview protocol but the interviewer has some freedom to vary the wording and order of the questions. According to McNamara (1999), the strength of the general interview-guide approach is the ability of the researcher to ensure that the same general areas of information are collected from each interviewee. This allows a degree of freedom and adaptability in getting information from the interviewee. One can summarise that a major advantage is that the data is gathered in a more systematic and comprehensive manner than in the informal, conversational-interview approach.

d) This interview type requires the interviewer to be relatively skilled and experienced because the interviewer needs to know when to probe for more in-depth responses and be able to guide the conversation to ensure that all topics on the outline are covered. Furthermore, the ways that questions are potentially worded depend upon the researcher conducting the interview. Thus, respondents may not consistently answer the same question(s) based on how they were posed by the interviewer (McNamara, 1999). It also difficult to compare or analyse the data as different participants respond differently to questions. Another possible negative issue is that complying with the outlined topics will prevent other important topics from being raised by the respondent.

e) The *informal conversational interview* is completely unstructured and the questions spontaneously emerge from the natural flow of things during field work. The informal conversational interview is outlined by Borg and Gall (2003) for the purpose of relying "…entirely on the spontaneous generation of questions in a natural interaction, typically one that occurs as part of on-going participant observation fieldwork". With the informal conversational approach, the researcher does not ask any specific types of question but rather relies on the interaction with participants to guide the interview process (McNamara, 1999). However, many researchers view this type of interview as unstable or unreliable because of the inconsistency in the interview questions, which make it difficult to code data (Cresswell, 2007).

f) The major advantage is that the interview can be considered highly individualised and particularly relevant to the respondent. For this, the interviewer should be very knowledgeable and experienced in the subject matter and possess strong interpersonal skills to show considerable discretion to direct the interview. It must be stressed that because information is collected from different people, the interview is not systematic or comprehensive and it can be very difficult and time-consuming to analyse the data.

The informal conversational interview represents the general kind of unstructured interview technique that originated in anthropology and sociology. In the literature, the term was used with informal conversational interview, in-depth interview, non-standardised interview, and ethnographic interview in an interchangeable manner

(Zhang and Wildemuth, 2009). While the terms and definitions are not the same, the basic characteristics of unstructured interviews are similar. Researchers come to the interview with no predefined theoretical framework, meaning that there are no hypotheses and questions regarding the social realities they are interested in. In unstructured interviews, the question and answer categories are predetermined and they rely on social interaction between the researcher and informants. They have conversations with interviewees and generate questions in response to interviewees' narration; consequently, each unstructured interview might generate data with different structures and patterns. The intention of unstructured interviews is to expose researchers to unanticipated themes and provide a better understanding of interviewees' social reality from interviewees' perspectives (Zhang and Wildemuth, 2009).

Patton (1990) mentioned the following advantages of interviews, they have the following advantages:

- Usually yield richest data, details and new insights.
- Permit face-to-face contact with respondents.
- Provide the opportunity to explore topics in depth.
- Allow the interviewer to experience the affective as well as cognitive aspects of responses.
- Allow the interviewer to explain or help clarify questions, increasing the likelihood of useful responses.
- Allow the interviewer to be flexible in administering interviews to particular individuals or in particular circumstances.

Some disadvantages of interviews are:

- Expensive and time-consuming.
- Need well-qualified, highly trained interviewers.
- Interviewee may distort information through recall error, selective perceptions and desire to please interviewer.
- Flexibility can result in inconsistencies across interviews.
- Volume of information too large; may be difficult to transcribe and reduce data.

3.5.2.4 Group Interviews, Group Discussion

When confidentiality is not a concern and the evaluator(s) are interested in quickly sampling a range of opinions on a topic, a group discussion is preferable because multiple responses can be obtained through focus groups in a shorter period of time than individual interviews (Stewart, 1997). Thus, a focus group is a frequently used and attractive form of group discussion. The method of interviewing participants in focus groups comes largely from marketing research but has been widely adapted to include social science and applied research (Marshall, 2006). A focus group discussion is an inexpensive, rapid (typically lasting a few hours) appraisal technique through which a facilitator guides people in a discussion of their experiences, feelings and preferences about a topic (Marshall, 2006). Focus groups fall into the qualitative interviewing category but, in this case, the interviews occur with groups of individuals (typically between five and eight people, with one or more groups in total) and are generally focused on a particular issue of interest to the researcher (Marshall, 2006). As Patton (1990) notes, participants are a relatively homogeneous group asked to reflect on the questions asked.

The researcher, as facilitator, follows a discussion guide and uses probing techniques to animate the discussion and promote in-depth reflection. The discussion guide contains only a few items and thus gives time and flexibility to pursue unanticipated but relevant issues. The facilitator must create a supportive environment, asking focused questions to encourage discussion and the expression of differing opinions and points of view.

However, focus groups can be more challenging to conduct than individual interviews due to the need to manage group dynamics (e.g. ensuring that all group members are able to speak their mind, without feeling silenced by others); these interviews are best run by a trained facilitator and often require a more formal setting (such as a boardroom) and may take more time to coordinate Patton (1990).

The advantages of focus-group interviews are that this method is socially oriented, studying participants in an atmosphere more natural than artificial experimental circumstances and more relaxed than a one-to-one interview (Marshall, 2006). When combined with participant observation, focus groups are especially useful for gaining access, focusing site selection and sampling, and even for checking tentative conclusions (Morgan, 1997). The results have high face validity because the method is readily understood and the findings appear believable (Krueger, 1988). In action research and in program design and evaluation, focus groups are especially useful (Marshall, 2006). Many participants in focus group discussions find the interaction stimulating and mention things they would not have thought of individually. Specific applications of the focus group method include (Marshall, 2006):

- Identifying and defining problems.
- Pretesting topics or ideas.
- Identifying strengths, weaknesses and recommendations.
- Assisting with interpretation of quantitative findings.
- Obtaining perceptions of project outcomes and impacts.
- Generating new ideas.

Focus groups provide answers to the same types of question as in-depth interviews, except that they take place in a social context. They are particularly helpful and Shackman (2006) suggests the following advantages of focus groups:

- To help investigate major problems that cannot be explained by more formal methods of analysis.
- When a researcher may see things that participants and staff may not see.
- When the researcher can learn about things which participants may be unwilling to reveal in more formal methods.
- When it is not clear what the problems might be.
- To give good ideas of what participants think is important.
- In developing surveys when determining what questions or issues are important to include.
- When a main purpose is to generate recommendations.
- When quantitative data collected through other methods need to be interpreted.

According to Marshall (2006), the disadvantages of the focus group method are:

- There can be an issue of power dynamics in the focus-group setting.
- The interviewer often has less control over a group interview than an individual one and time can be lost while dead-end or irrelevant issues are discussed.

- The data are difficult to analyse because context is essential to understanding the participants' comments.
- The method requires the use of special room arrangements and highly trained observer moderators.
- The groups can vary a great deal and can be hard to assemble and logistical problems may arise from the need to manage a conversation while getting good quality data.

The advantages and disadvantages of these methods are discussed later when addressing the application of these methods (see next section). The prior sections have examined a variety of methods that might be used in collecting data. The next step is to decide which data collection method is appropriate to use in this research. In the following sections the choice of specific data collection methods for this research is justified.

3.6 The Deployment of Specific Data Collection Methods

The prior sections of this chapter determined DBR the methodology for this research and, consequently, the next sections discuss the DBR methodology in the light of choosing the appropriate data collection methods for this research. The choice of methods is driven by the types of the question that must be answered by the research (Cresswell, 2003; Johnson and Christensen, 2004). Thus, the starting point is to consider what kinds of information are needed.

3.6.1 Questions and Choice of Data Collection Methods

Based on the aims of the phases from the DBR methodology, specific researchable questions can be formulated and, hence, data collection methods. As discussed, the DBR methodology in this research (see Figure 10) suggested 4 phases: "1. Analysis Phase", "2. Design Phase", "3. Evaluation and Improvement Phase", and "4. Validation Phase".

3.6.1.1 Analysis Phase

This aim of this phase relates to the following questions:

1. What is the research problem?
2. How is the research problem perceived by experts?

Question 1 is addressed by a literature review because it is mainly intended to identify relevant existing research, which enables gaps to be identified in previous research. Question 2 is addressed by qualitative interviews because they are the most adequate tool to capture how a person thinks of specific issues, thus providing the opportunity to explore the topic in depth (the results are mentioned in the introduction chapter). Furthermore, interviews are supported by a final focus group session because interaction of respondents may stimulate a richer response or new and valuable thoughts; thus, a final focus group session is held.

3.6.1.2 Design Phase

The key constructive aim is to formulate a tentative [initial] solution from the literature to bridge the research gap and to expose it to critique from experts.

3. What is a tentative solution to the research problem?
4. How is the tentative solution (the Initial KBBPI framework) perceived by experts?
5. How can the initial KBBPI framework be improved (this can formulate an intermediate KBBPI framework)?

Question 3 can be addressed by a literature review because it is mainly intended to identify prospective components from relevant existing research.

Question 4 can be addressed by in-depth interviews because, as discussed, they are the best available tool to capture how a person individually thinks of specific issues and thus provide the opportunity to explore the topic in depth.

Question 5 is addressed by a focus group because interactions of respondents are relevant, group interaction stimulates richer responses and new valuable thoughts are important regarding the improvement opportunities.

3.6.1.3 Evaluation and Improvement Phase

The aim of this phase is to implement and evaluate the KBBPI framework in a practical setting. This aim relates to the following questions, which were derived from the reflective cycle (Figure 11).

6. What problems are experienced during implementation of the KBBPI framework?
7. What are the tentative solutions to the experienced problems?
8. How are the alterations or additions to the KBBPI framework perceived?

Question 6 is addressed by qualitative interviews in order to find out what experiences the participants made during implementation. Qualitative interviews provide the opportunity to explore the made experiences in depth and to identify potential reasons for problems and success. The interviews deal with questions such as "What worked?", "What did not work?", "Why did it work?", "Why did it not work?", and "How can we do it differently next time?"

Furthermore, this question is addressed by the researcher's observations and a focus group session in order to increase the validity of findings.

Question 7 is addressed by a literature review aimed at identifying tentative solutions to the experienced problems.

Question 8 is addressed by in-depth interviews in order to gather rich data capturing what experts and participants think about the tentative solutions identified from literature.

The final objective in this phase is to formulate the final KBBPI framework.

3.6.1.4 Validation Phase

The objective is to establish that the KBBPI framework is suitable for its intended use.

9. Is the final KBBPI framework perceived as a solution to the gap?

Question 9 is addressed by a focus group session with experts in order to gather rich data about what experts think about the final KBBPI framework being used as a solution to the gap.

3.6.1.5 Summary of the Deployment of Data Collection Methods

The consideration in section 3.6 are summarised in Table 8.

Table 8 Data Collection Methods in the Phases of this Research

Phase/Aim	Question	Data Collection Method
Analysis Phase The objective is to identify the knowledge gap in the field and to validate the research problem.	1. What is the research problem?	Literature review
	2. How is the research problem perceived by experts?	Interviews and focus group
Design Phase The objective is to determine a methodology to address the gap. Another objective is to formulate an initial tentative solution from literature to bridge the gap and to expose it to critique from experts.	3. What is a tentative solution to the research problem?	Literature review
	4. How is the tentative solution (the initial KBBPI framework) perceived by experts?	Interviews Focus group
	5. How can the initial KBBPI framework be improved (formulation of the intermediate KBBPI framework)?	Interviews Focus group
Evaluation Phase The objective is to implement and evaluate the KBBPI framework in a practical setting. A further objective is to reflect on the results from evaluation of the KBBPI framework and the possibilities for improvement through redesign (the final KBBPI framework).	6. What problems are experienced during implementing the KBBPI framework?	Interviews, focus groups, and observations
	7. What are the tentative solutions to the experienced problems?	Literature review
	8. How are the alterations or additions to the KBBPI framework perceived?	Interviews Focus group
Validation Phase The objective is to establish that the KBBPI framework is suitable for its intended use.	9. Is the final KBBPI framework perceived as a solution to the gap?	Focus group (validation panel)

Once the appropriate data collection methods have been determined, the data collection must be conducted and any issues need to be addressed. The next subsection discusses these issues.

3.7 Application of the Chosen Data Collection Methods

The detailed discussion about conducting data collection is given in Chapter 5. This subsection is limited to discussing general rules for conducting data collection.

3.7.1 Permissions

Firstly, before data are collected, necessary permissions must be obtained. Many groups have a set of established procedures for gaining clearance to collect data on research projects. This may include identification of persons to receive/review a copy of the report, restrictions on when data can be collected, or procedures to safe-guard the privacy. The researcher considered this during preparation of the case study and details of these issues are given in Chapter 5.

3.7.2 Sampling in Qualitative Research

Whilst there are no closely defined rules for sample size (Patton, 1990), sampling in qualitative research usually relies on small numbers with the aim of studying in depth and detail (Miles and Huberman, 1994; Patton, 1990). Seeking a richness of data about a particular phenomenon, the sample is derived purposefully rather than randomly (Patton, 1990). Purposeful sampling is a non-random method of sampling where the researcher selects information-rich cases for study in depth (Patton, 1990). Information-rich cases are those, as in this research, from which one can learn a great deal about issues of central importance to the purpose of the research; thus, the term 'purposeful sampling' (Patton, 1990).

Tuckett (2004) suggests that qualitative sampling is a process embodied within a reasonably flexible research design, in which sampling criteria may change as the study unfolds; participants are sought serially (depending on who and what has come before so that ongoing sampling supports the emerging theorising). Tuckett (2004) further argues that sampling continues until the researcher recognises no new data were forthcoming, which is the point of data or information redundancy. The point of information redundancy (comparable to data saturation) is dependent upon concurrent data analysis and data collection.

In this research, a recruitment strategy is developed and discussed in chapter 5, including criteria for selecting participants and the number of people to be recruited.

The recruitment strategy is developed in close consultation with managers from the organisation and it is determined by the type and number of data collection activities in the study and by the characteristics of the organisation in the case. The recruitment strategy is discussed in greater detail in Chapter 5.

3.7.3 Conducting and Recording

Well-conducted and transcribed data relates to validity; thus, these issues are discussed in the next sections.

3.7.3.1 Literature Review

Although the literature review is a continuous process over all stages and steps, one can distinguish, corresponding with the suggested research methodology, two main stages of literature review in this research. The first phase aims to identify a knowledge gap in the field (corresponding to the practice problem) and to provide some degree of reassurance to the researcher that this research is relevant to practitioners and scholars. The second phase of literature review aims:

- To highlight key debates and what they are about.
- To place the research in the context of the research done by others.
- To lay the groundwork for the study methodology.
- To identify and formulate a conceptual framework, which serves as a starting point for further designing and implementation.

Besides being the knowledge base about the research topic, the literature review demonstrates the researcher's skills in the following two main areas:

1. *In information seeking*: the ability to scan the literature efficiently, using manual or computerised methods, to identify a set of useful articles and books.
2. *In critical appraisal*: the ability to apply principles of analysis to identify unbiased and valid studies.

The literature review is generally an iterative process; thus, the steps and structure of the literature review itself is already a result from initial cycles of the literature review, where a general overview of the field and relevant topics is elaborated. While the literature review is a common aspect of most research, it is often overlooked as a form of qualitative research (di Gregorio, 2000). The process of building an argument from a body of literature is very similar to the process of analysing qualitative data. The literature review process comprises the following steps:

1. Reading and reflecting.
2. Interacting and commenting on the information.
3. Identifying key themes and coding.
4. Extracting "gold dust" quotes from the codes to be used when writing up.
5. Linking similar ideas from different articles/transcripts.
6. Building arguments/analysis with links to supporting evidence.

For the literature review only, material from well-known publishers and referred journals from reliable sources was included. Books, papers, and web sources were accessible from the different libraries but mainly from the library at the university in Chur, Switzerland, where the researcher is and was working as a lecturer. The search was conducted into related literature from the last decade in order to trace its development. Criteria for inclusion were direct or indirect reference to the topic of KBBPI in small KIBS, with special focus on management consultancies. Some earlier material was included because it forms the foundation of the literature of KM and BPI. In order to find the relevant literature, keywords were formulated based upon the topics outlined above and applied to the literature search in electronic literature indexes, catalogues and search engines. The keywords chosen for the search were, for example: management consultancies; knowledge-intensive businesses; knowledge-based process improvement; knowledge management frameworks; process oriented KM; generations of knowledge management etc.

Since knowledge management is an extremely broad concept, many further terms were also searched. Consequently, the review of related literature was a substantial undertaking from the number of articles and references found during the literature search.

3.7.3.2 Observations

This research uses participant observation in order to gain understanding of the physical, social, cultural, and economic contexts in which study participants live (Bogdewic, 1992). Marrelli (1998) argues that researchers suffer time constraints when doing research and, thus, observation periods need to be selected. This research applies continuous observation and all relevant assessed behaviours are noted during the implementation of the framework in the case. This method does not usually focus on a specific set of behaviours and is often used in exploratory studies to identify key behaviours that will later be studied in more depth (Marrelli, 1998). The researcher, as observer, writes a protocol, a brief narrative of everything that happens and when it happens, details of which are given in the appendices. These notes are frequently used to provide more in-depth background or to help the observer remember events. These field notes contain description of what has been observed. The date of the observation should be recorded and everything that the observer believes to be worth noting should be included (Marrelli, 1998).

3.7.3.3 Interviews

Zhang and Wildemuth (2009) suggests the following working guidelines for how to conduct interviews, which are discussed in the light of this research:

1. *Accessing the setting.* Various difficulties are documented about getting access to research settings; thus, the interviewer has to take into consideration any possible political, legal, and bureaucratic barriers. The access to the setting is given due to the fact that the researcher is an insider at the organisation used as the case study.

2. *Understanding the language and culture of the interviewees.* Interviews are governed by the cultural conventions of the research settings, which require that the researcher can understand an interviewee's language and its meanings in the specific culture context. The researcher, in his dual role as researcher and employee, is familiar with the organisation and no specific actions are required.

3. *Deciding on how to present one-self.* Interviews are two-way conversations with minimum control from the interviewer. The quality of the conversation is influenced to a great extent by how the interviewer represents himself in the interview. The researcher is already personally known to all interviewees; therefore, presenting himself is of minor influence.

4. *Locating an informant.* Locating the interviewee involves finding an insider of the group under research who is willing to talk with the researcher, or act as a guide

and translator of unfamiliar language and culture (Fontana and Frey, 2000). Once more, since the researcher is an insider to the organisation, no informant is needed.

5. *Gaining trust and establishing rapport.* Gaining trust and establishing rapport is essential to the success of interviews. When endeavouring to cultivate rapport, the interviewer might need to ensure the researcher maintains the necessary distance to remain objective and not become a spokesperson for the group under study (Fontana and Frey, 2000). In this research, the researcher plays a dual role as participant and researcher; consequently, tensions arise in the apparent duality of the role and this issue is discussed in more detail in a later section.

6. *Collecting the empirical materials.* Note-taking is a traditional method for recording interview material. However, in an unstructured interview, note-taking is difficult and could disrupt the natural flow of the conversations. As with observations, detailed recording is a necessary component of interviews since it forms the basis for analysing the data.

   Interview data can be recorded on tape (with the permission of the participants) and summarised in notes. Transcription of the raw data includes word-for-word quotations of the participant's responses as well as the interviewer's descriptions of participant's characteristics, enthusiasm, body language and overall mood during the interview (Zhang and Wildemuth, 2009). The major advantages of this transcription method are its completeness and the opportunity to remain focused during the interview. The major disadvantages are the amount of time and resources needed to produce complete transcriptions and the inhibitory impact tape recording has on some respondents (Zhang and Wildemuth, 2009). Another method called "note expansion" means that, as soon as possible after the interview, the interviewer listens to the tape to clarify certain issues and to confirm that all the main points have been included in the notes. This approach is recommended when resources are scarce, when the results must be produced in a short period of time and when the purpose of the interview is to get rapid feedback from members of the target population (Zhang and Wildemuth, 2009). The obvious disadvantage is that the interviewer may be more selective or biased.

   However, participants were not willing to have discussions taped; therefore, the approach applied in this research uses detailed notes taken during the interview. These were expanded on and clarified immediately after the interview in order to minimise errors/losses through memory.

3.7.3.4 Focus Groups

Although focus groups and in-depth interviews share many characteristics, they should not be used interchangeably. However, the considerations in the prior section regarding interviews are also relevant for the focus group.

An important aspect of conducting focus groups is the topic guide (Krueger, 1988). The topic guide is a list of topics or questions and serves as a summary statement of the issues and objectives to be covered by the focus group (Kumar, 1987). The topic guide also serves as an agenda, as a memory aid and it also provides the initial outline for the report of findings.

The participants can be selected based on their functions in the process and the selected members of the organisation are invited to participate in the workshop. In the focus group, the data could be tape recorded, with the agreement of participants, and should be transcribed as soon as practicable later by the researcher. These transcripts are sent to the participants in order to be validated by them. Furthermore the researcher makes detailed notes during the interview in order to minimise errors/losses through memory.

3.8 Data Analysis in Qualitative Research

Qualitative data analysis (QDA) is the search for patterns and relationships in raw data and it also aims to collect explanations for those patterns and relationships. QDA deals in words and is guided by fewer universal rules and standardised procedures than statistical analysis (Miles and Huberman, 1994). Data analysis is the least structured phase of qualitative research (Miles and Huberman, 1994). There are no clearly obvious rules and procedures for interpretation in qualitative data analysis and qualitative data researchers rely mainly on their own judgement, experience and insight (Miles and Huberman, 1994). Consequently, one of the reasons why it is found to be difficult is that it is not fundamentally a mechanical or technical exercise. It is left to the intuitional ability of the researcher to judge what the data is about and the interpretation of data takes place at various levels during the research process (Alvesson and Sköldberg, 2000). Hoepfl (1997) defines qualitative data analysis as "working with data, organising it, breaking it into manageable units, synthesising it, searching for patterns, discovering what is important and what is to be learned, and deciding what one will tell others". Cresswell (2003) argues that it is important to note that the process of data analysis is eclectic; in other words, there is no single way of analysing qualitative data.

3.8.1 Methods of Qualitative Data Analysis

Ratcliff (2005) compiled a list of 15 methods for data analysis in qualitative research, which are typology, taxonomy, constant comparison/grounded theory, analytic induction, logical analysis/matrix analysis, quasi-statistics, event analysis/microanalysis, metaphorical analysis, domain analysis, hermeneutical analysis, discourse analysis, semiotics, content analysis, phenomenology/heuristic analysis and narrative analysis. This list shows that many approaches to analysis of qualitative data are available. Priest et al. (2002), as well as Thomas (2003), suggest that notable approaches to QDA are grounded theory, content analysis and narrative analysis. The next three sections provide a brief outline of the philosophical basis of each approach, along with key analytical principles. This discussion is aimed at determining the QDA approach for this research.

3.8.1.1 Grounded Theory

Grounded theory (Glaser and Strauss 1967) has its conceptual orientation in "symbolic interactionism, which means human beings are acting rather than just responding beings and that human action is purposeful and based on the meanings that the individual has for them". Consequently, data must be collected in the natural context using a variety of methods, such as interview and observation. Grounded theory aims to generate theory through inductive examination of data in subject areas that may be difficult to access with traditional quantitative research methods (Rennie et al., 1988).

In terms of analysing and collecting data, Glaser and Strauss (1967) describe a set of systematic procedures that they term the constant comparative method. In essence, this is an iterative process involving concurrently collecting and analysing data with the ultimate aim of generating a theory that is grounded in the natural context in which the inquiry takes place (Strauss and Corbin, 1990).

One problem is that, for inexperienced and experienced researchers alike, the notion of collecting data, coding and categorising it, writing memos about emerging ideas and concepts, determining a core category, and constantly recycling through the stages to eventually generate a cogent theory is, to say the least, challenging.

Grounded theory uses three sets of coding procedures that help to break down the original data, conceptualise it and re-arrange it in new ways. Strauss and Corbin (1990) refer to the three coding stages as:

1. *Open coding*: This is the first part of the analytic process and primarily involves fracturing, which is taking the data apart and examining the discrete parts for differences and similarities. Data means a sentence or paragraph of speech from an interview or an observation. While this process is underway, the researcher asks questions of the data; for example, "What is the basis for this point of view? Do other participants hold similar beliefs? Is there a specific theme or concept to which this issue relates?" Questioning of this nature leads to new discoveries being made in the data and this process is characteristic of the constant comparative method described by Glaser and Strauss (1967). The aim of this stage of analysis is to identify discrete concepts, which are the basic units of analysis in grounded theory (Strauss and

Corbin, 1990). By looking for similarities and asking questions, concepts that are, in essence, very similar can eventually be labelled with the same name. Each concept can then be defined in terms of a set of discrete properties and dimensions to add clarity and understanding. In due time, the list of concepts generated has to be sorted into groups of similar or related phenomena that, in turn, become categories. According to Strauss and Corbin (1990), categories have conceptual power because they can pull together other groups of concepts or sub-categories. It is this feature that moves open coding on to axial coding.

2. *Axial coding* is the term used to denote the way in which connections are made in new ways between categories and sub-categories. Strauss and Corbin (1990) describe the key difference of this stage as being the identification of specific features, such as the conditions that give rise to the phenomenon and the context in which the concept is embedded, which, in turn, help to give precision to a category or sub-category. They note that open and axial coding can occur in tandem, even though they are distinct analytical procedures. As axial coding proceeds, patterns in the data become apparent and it is possible to generate tentative hypotheses or statements of relationships between phenomena. The next stage is to verify if these statements hold true against the rest of the data collected or if they can be used as a focus for future data collection. However, as Strauss and Corbin (1990) importantly point out, this phase is not simply about seeking confirmation of relationships but it also involves looking for instances where there are variations and contradictions in the data. Whereas, in some quantitative research designs, the discovery of competing perspectives might bring the results of analysis into dispute, such findings do not necessarily negate hypotheses in grounded theory (although they might if the evidence is sufficient); they add variation and depth to understanding of the phenomenon (Strauss and Corbin, 1990).
3. *Selective coding*: involves identifying one or two core categories, to which all other sub-categories relate, and building a conceptual framework from which to develop a grounded theory. It is this final integration of codes and categories into a coherent theory that is probably the greatest challenge and,

> ironically, probably one reason why many studies compromise this stage of analysis.

The ultimate aim of utilising these procedures is to allow a systematic, dense, explanatory theory to be developed (Strauss and Corbin, 1990). It is important to point out that coding in the three stages does not necessarily follow in sequence.

3.8.1.2 Qualitative Content Analysis

Qualitative Content Analysis (QCA) originated in the 1950s as a quantitative approach to analysing the content of media text to enable similar results to be established across a group of text coders (Miles and Huberman, 1994). QCA facilitates contextual meaning in text through the development of emergent themes (Bryman, 1984) derived from textual data. Repetition of coding produces the significance of particular themes (Burton 2000). QCA is a widely used method for eliciting meaning from text and it is increasingly undertaken through computerised software packages (Woods and Roberts, 2000).

QCA facilitates the production of core constructs from textual data through a systematic method of reduction and analysis (Miles and Huberman, 1994).

Text is coded into established categories to support the generation of ideas. The number of times a similar piece of text or idea unit is attributed to a particular category can then be counted. From these sub-codes, analytic variables emerge. Thereafter, a process of first-level coding can begin through line-by-line analysis whereby highlighted chunks of varying size; for example, phrases, sentences, or whole sections (Miles and Huberman 1994), are pasted to particular analytic categories. Thus, several paragraphs of text can be reduced through content coding. Through content analysis, this process progresses to second-level coding whereby a more detailed indexing is undertaken (Miles and Huberman, 1994). Following data reduction, constructs are formulated through a process of interpretation based on the contextual settings from which data were derived (Miles and Huberman, 1994). The process of data analysis becomes one of continual checking and questioning of emerging themes (Miles and Huberman, 1994).

3.8.1.3 Narrative Analysis

Bruner (1990) claimed that narrative knowledge (that is, knowledge derived from stories) was as essential as paradigmatic knowledge (knowledge gained from science) in enabling people to make sense of the world. The interview, particularly an unstructured interview, is the data-generation method most often selected by researchers using narratives (Bruner, 1990). Therefore, a narrative may be "any extended segment of talk in which an interviewee is telling a story". Narrative analysis can be applied to any form of textual data, e.g. generated from interviews.

Stories may be found within any set of textual data; there is a view that formal "how to do it" manuals are unhelpful because individual researchers must create their own method (Bruner, 1990).

However, Emden (1998) describes a procedure that may be applied to transcribed interview data in order to arrive at a core story. First, the text is read several times. Interviewer questions and comments are deleted, as are words that detract from the key idea of each sentence or group of sentences. The remaining text is read for sense and any further detracting words or phrases deleted. This procedure is repeated as often as necessary until fragments of themes (sub-plots) remain. These sub-plots are moved together to create a coherent core story. Emden (1998) recommends that, at this point, the core story is returned to the interview participant for correcting or developing as necessary.

This section presented an overview three qualitative research approaches and the next step is to discuss the QDA for this research.

3.8.2 The Qualitative Data Analysis in this Research

As already described, data in this research study are collected by means of observation (field notes), individual interviews and focus groups. The main goal of traditional interviews is to detect consistency in an interviewee's response; interviews for discourse analysis focus on variations in responses, according to the discursive context. In this research, the aim is to expose the framework to practice. As a consequence, the interview and focus group method is not based on a strict set of defined questions but on a conversational agenda (Holstein and Gubrium, 1995). A conversational agenda allows the flexibility necessary for engaging in a construction process and predetermines, to a lower extent, the data emerging from the interview. In that sense, the research interview can be conceived as "the scene for a conversation rather than a simple tool for collection of data" (Alvesson and Deetz, 2000). However, that relative flexibility does not mean the absence of organisation. As an interviewer, the researcher consciously provided precedence, stimulation, restraint and perspective in the process of the interview. As Holstein and Gubrium (1995) emphasise, the goal of an active approach is to "cultivate the respondent narrative activity". Details of the conversational agenda used for the interviews and focus groups are given in Chapter 5 and in the appendices. One can summarise that the data in this research is narrative data and it comes in many forms from a variety of sources. The data available in this research includes:

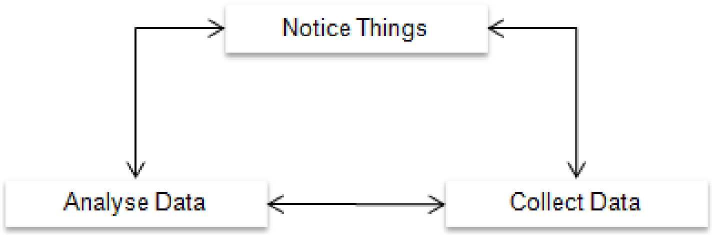
- Responses to open-ended questions.
- The transcripts from interviews and focus groups.
- Notes from field notes.
- Text from documents.

The data stems from a few individuals in a single case study. The above considerations indicate the QDA method for this research can be a narrative data analysis.

3.8.2.1 Workflow of Qualitative Data Analysis

Since it is difficult in qualitative research to separate out data collection and data analysis, there is movement back and forth between generation and analysis. Thus, Seidel (1998) argues that QDA consists of three interwoven processes, which are noticing, collecting and thinking about interesting things. Noticing represents the data collection and means taking notes based on the applied data collection methods.

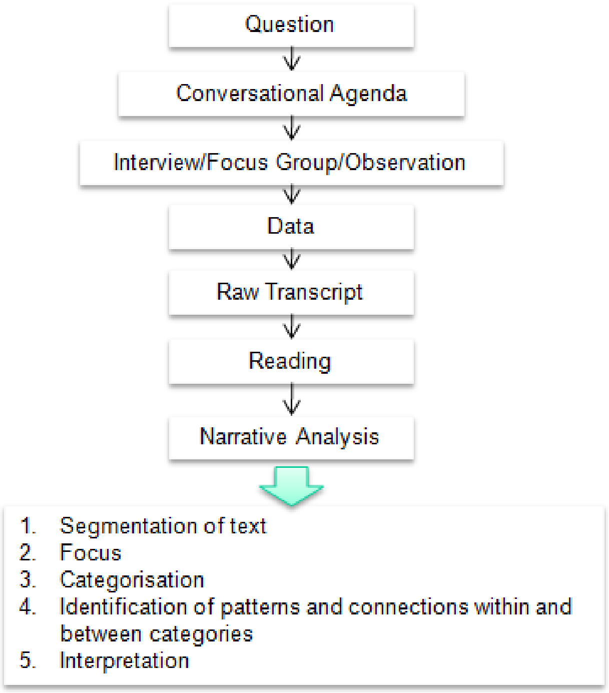
Figure 12. Workflow of Qualitative Data Analysis


Notice Things
Analyse Data
Collect Data

Source: Seidel (1998)

The researcher generates data continuously and is analysing the data in parallel (Figure 12). This is also true for this research, in which data collection and data analysis are two interwoven processes. However, the problem is to make sense of the collected data. Herman and Vervaeck (2001) offer a framework for narrative analysis (see Figure 13).

Figure 13. Data Analysis Framework


Question
Conversational Agenda
Interview/Focus Group/Observation
Data
Raw Transcript
Reading
Narrative Analysis
1. Segmentation of text
2. Focus
3. Categorisation
4. Identification of patterns and connections within and between categories
5. Interpretation

Source: Herman and Vervaeck (2001)

In the suggested data analysis framework, the clarification of the research question is the important first step. The data from interviews and focus groups have a narrative style. Data can be collected by audio-taping or it might be in written form, from which a raw transcript is then produced. The approach to analysis can then take several forms but, in this research, it usually involves reading through the raw transcript several times, returning to the original data on occasions and then selecting one or more particular sections for very careful analysis, using one of several analysis techniques.

3.8.2.2 The Analysis Procedure

1. Step, Segmentation

Analysis proceeds by first breaking the text down into numbered segments. Since narratives are basically a sequence of episodes, researchers define a segment as being roughly a self-contained episode, or "move", in the telling of the story (Herman and Vervaeck, 2001). Herman and Vervaeck further argue that this might not be foolproof but it is relatively straightforward and transparent. Segmentation of the text can be done, first with a quick read-through marking the segments and then followed by a more careful read-through making adjustments. The result is illustrated in detail in Chapter 5.

2. Step, Focus of the Analysis

The focus of analysis depends on the purpose of the evaluation and how it is used in the results; an example is given and discussed in detail in Chapter 5. In order to explain the principle, the following two common approaches are presented:

- *Focus by question or topic, time period or event.* In this approach, the analysis is focused on how all individuals or groups responded to each question or topic, or for a given time period or event. The data is organised by question to look across all respondents and their answers in order to identify consistencies and differences. Later, the connections and relationships between questions (topics, time periods, and events) can be explored.
- *Focus by individual or group.* The focus might be on one individual (the owner) or one group, such as all consultants, which means the data might be

grouped by question or topic, individual or group.

Additionally, a combination of these approaches is possible depending on the expected results.

3. Step, Categorisation of Data

Categorising does not involve assigning numerical codes as in quantitative analysis. In order to bring meaning to the words:

- Identify themes or patterns — ideas, concepts, behaviours, interactions, incidents, terminology or phrases.
- Organise them into coherent categories that summarise and bring meaning to the text. This involves reading and re-reading the text and identifying coherent categories.

Abbreviated codes of a few letters are placed next to the themes and ideas, which helps to organise the data into categories. During categorisation, other themes that serve as subcategories may occur. The categorisation is continued until all relevant themes have been identified and labelled. The coding system in this research was specific for each research step and continually revised during the research; it developed greater specificity through the addition of sub-categories, which further defined events and phenomena as they were revealed. Thus, written field notes that consisted of transcript files, personal files and analytical files, were established from the beginning of the data collection process. Those files included information necessary to assist in analysing the response data of participants and some observations. An example of categorisation is given and discussed in detail in Chapter 5.

4. Step, Identification of Patterns and Connections Within and Between Categories

As the data is organised into categories patterns, connections both within and between the categories are identified. Assessing the relative importance of different themes or highlighting subtle variations may be important (an example is given and discussed in detail in Chapter 5).

Within category description, means summarising the data pertaining to one theme, or capturing the similarities or differences in people's responses within a category.

- *Larger categories:* several times larger super categories might be created that combine several categories, which means working up from more specific categories to larger ideas and concepts. This allows recognising how the parts relate to the whole.
- *Relative importance:* to show which categories appear more important, a particular occurrence of a theme in each category might be counted. These counts provide a very rough estimate of relative importance. Although they are not suited to statistical analysis, they can reveal general patterns in the data.
- *Relationships:* one may also discover that two or more themes occur together consistently in the data. One may decide that some of these connections suggest a cause and effect relationship, or create a sequence through time and, from this; one might argue that X causes Y. Such connections are important to look for because they can help explain why something occurs. If necessary, one may wish to develop a table or matrix to illustrate relationships across two or more categories.

5. Step, Interpretation

In this step, themes and connections are used to explain the findings. This is what is called interpreting the data, attaching meaning and significance to the analysis.

The starting point is to develop a list of key points or important findings discovered as a result of categorisation and sorting the data. The next step is to develop an outline for presenting the results to other people or for writing the final report. The length and format varies depending on the audience and it is often helpful to include quotes or descriptive examples to illustrate the points and bring the data to life. A visual display helps communicate the findings and the creation of models reveals gaps in the investigation and connections that remain unclear.

3.9 Quality Criteria of this Research

Lincoln and Guba (2000) describe the criteria frequently cited for evaluating qualitative studies. They propose four constructs that reflect the assumptions of the qualitative paradigm accurately, which are constructs are credibility, transferability, dependability and conformability.

3.9.1 Credibility

The following techniques were applied and procedures were followed to enhance the credibility of this research study.

3.9.1.1 Prolonged Engagement

The first prolonged engagement is the investment of sufficient time. Similarly, building trust is crucial because the researcher is able to increase rapport with the participants through familiarity and by the discovery of hidden information. Furthermore, close researcher-participant relationships are critical to the research enterprise.

3.9.1.2 Reflexivity

Reflexivity (field journal) is the use of field notes, which provide the researcher with both data gathering and an analytical tool to assist in understanding the setting. Reflexivity is the ability to formulate an integrated understanding of one's own cognitive world, especially understanding one's influence or role in a set of human relations (Lincoln and Guba, 2000). In this study, the researcher made use of field notes to describe and interpret his behaviour, experiences and observations regarding the research process, in order to reflect on how they influence data collecting and analysis.

Consequently, once the researcher is aware of these biases, he may alter the way he collects the data or approaches the analysis to enhance the credibility of the research.

3.9.1.3 Triangulation

Credibility can be obtained by using triangulation of various sources of data, the creation of a case study database and by following the chain of evidence (Yin, 1994).

Using several sources as well as presenting a rich picture of the organisation and the research units, allows such triangulation. The approach of employing multiple techniques in research is called triangulation and is the central organising principle in this research (Patton, 1990; Jensen and Jankowski, 1991; Bloor, 1997; Hansen et al., 1999). Hansen et al. (1999) also suggest that triangulation can be carried out in a variety of ways. Patton (1990) and Denzin and Lincoln (1998) identify four basic types of triangulation:

1. *Investigator* triangulation (the use of several different researchers or evaluators).
2. *Methodological* triangulation (the use of multiple methods to study a single problem or program).
3. *Data-source* triangulation (the use of a variety of points of time, space and persons).
4. *Analysis* triangulation (the use of multiple perspectives to interpret a single set of data).

The application of multiple strategies of triangulation in this research enabled accuracy of the data, thereby overcoming the intrinsic bias of single method, single observer and single theory studies (Denzin and Lincoln, 1998). Multiple triangulation was achieved by applying the four types of triangulation:

1. A kind of investigator triangulation was attempted by the fact that there was a research team of two supervisors and one student who had prominent roles and different expertise that was evident in the thesis. More specifically, the student conducted the analysis and the supervisory team provided some kind of validation and legitimacy (Mitchell, 1986; Kimchi et al., 1991).
2. The methodological triangulation was achieved by combining different data collection methods, such as review of literature, visual observation and interview. These were chosen because each could highlight a different dimension of the research problem (Kimchi et al., 1991).
3. The data-source triangulation was achieved by using different persons in interviews and focus groups at different points of time in the research process.
4. Fourthly, analysis triangulation was achieved by using more than one strategy to analyse the same set of qualitative data.

3.9.2 *Transferability*

Generalisation, external validity, transferability and applicability are often equivalently used in the literature (Yin, 1994). The terms ‘generalisation’, ‘external validity’ and ‘transferability’ refer to the extent to which the research’s findings can be generalised beyond the immediate case study and applied to other contexts or to other cases of the entire research population (Yin, 1994).

However, the purpose of a case study is not to represent the world but to represent the case; therefore, case studies have to be selected based on theoretical sampling and not on random sampling, as with quantitative research (Patton, 1990; Yin, 1994).

As discussed previously, this research approach is conducted in a context of a unique situation leading to a single case study approach. Thus, to provide a context for evaluating the transferability of the findings in this research, the researcher should use theoretical purposeful sampling and develop a thick description of the data that can be reviewed by others (Patton, 1990; Yin, 1994).

One can summarise that transferability was accomplished in this research by adopting purposeful sampling and writing an information-rich case study. Thus, the researcher collects sufficiently detailed descriptions of the data in context and reports to allow judgements about transferability.

3.9.3 *Dependability*

To show the appropriateness of the methods employed, relevant references from the literature are used to show an understanding of data collection methods and to justify their use over alternative techniques. Dependability can also be enhanced through triangulation to ensure that the weaknesses of one method of data collection are compensated by the use of alternative data-gathering methods. Triangulation of methods ensured the dependability of this research study since data were collected through interviews, focus groups, field notes and observations.

3.9.4 *Conformability*

Neutrality captures the traditional concept of objectivity of the data and interpersonal conformability (Lincoln and Guba, 2000). In this research, neutrality referred to the degree to which the findings are a function solely of the participants and conditions of the research. The researcher plays a dual role as participant and researcher; consequently, tensions regarding neutrality arise in the apparent duality of the role. By definition, this is a typical situation in AR, which is research conceived and carried out mainly by insiders, by those engaged in and committed to the situation and not by outsiders or spectators (Yin, 1994). AR is generally not without problems in this constellation because AR undermines the simple distinction between the researcher and the researched. Thus, the dual role of the researcher may influence the findings. In order to avoid the most obvious pitfalls, it is important to be aware of the bias. An obvious risk is getting too involved and losing objectivity; for example, there might be the necessity to criticise the researcher's suggestions, which were made earlier as a consultant. Neutrality in this study was facilitated through reflexive analysis, which means the researcher is aware of his influence on the data. Therefore, triangulation and reflexive field notes were applied in order to enhance the conformability.

3.9.5 Ethical Considerations

Babbie and Mouton (2001) argue that the ethical aspects in research are an important principle and that researchers have to adhere to strict ethical guidelines to protect the rights of participants. In conducting observations, interviews and focus group sessions, ethical issues are one of the main concerns (Babbie and Mouton, 2001). Some of the key ethical principles applied in this research are discussed in the following paragraphs.

3.9.5.1 Informed Consent

In general, all participants received the required information about this the research study and the researcher’s role was explained prior to the commencement of the data collection.

In participant observation, the researcher followed the recommendations suggested by Smith (2005) and ensured that when conducting observations, the participants were aware of the researcher’s identity and purpose. The participants were informed that any of their interactions with the researcher may constitute some form of data gathering. The researcher received, where appropriate, the permission from participants, as well as from the responsible managers, to conduct such observations. In general, all participants remained free to participate or not. Due to the fact that observation was limited to several occasions, no general company-wide announcements about observations were required.

In conducting the focus group sessions and interviews, the researcher provided information about the purpose and uses of participants' contributions in advance.

3.9.5.2 Voluntary Participation

All members of the organisation participated generally voluntarily and their roles were clarified in the research study, as emphasised by Miles and Huberman (1994) with regard to providing clear information to participants about their roles. Due to the fact that all members of the organisation were informed about this research, voluntary participation in observations was also guaranteed.

3.9.5.3 Anonymity and Confidentiality

All participants remained anonymous in all aspects of the research; no real names or any other identifying data were used.

A particular ethical issue to consider in the case of focus groups is the handling of sensitive material and confidentiality because there is always more than one participant in the group. Thus, the researcher clarified at the outset of the focus group session that each participant's contributions are shared with the others and participants were encouraged to keep as confidential what they hear. Similar rules of confidentiality were also guaranteed in the context of interviews.

The research is, of course, known to management and the HR department of the organisation in the case. The organisation granted full access to the required data in this research, under the condition that all material is only used for this research and must be kept confidential.

3.9.5.4 Reporting

The researcher guaranteed objectivity and integrity while conducting this research study by providing detailed information, as well as by highlighting methods and techniques used in the study. The researcher aimed to act responsibly by maintaining a professional standard and he also demonstrated integrity by acknowledging his own limitations, value systems.

3.10 Summary

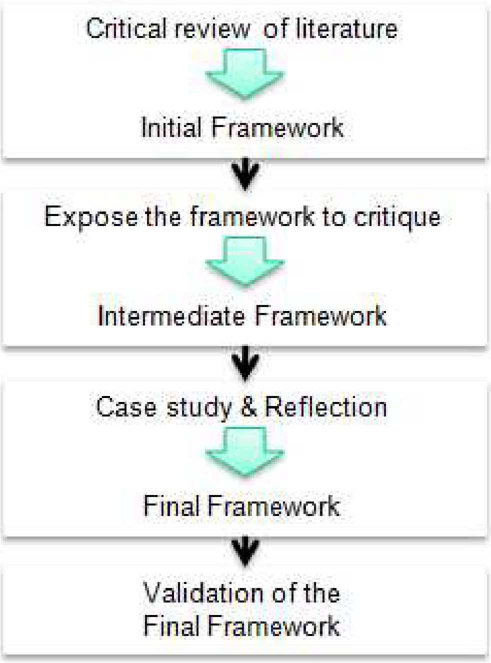
The research objective in this chapter was fulfilled by determining an adapted DBR methodology for this research that addresses the research gap. The idea in this research is to try out a tentative solution in the work practice, gain feedback from this experience, modify the theory as a result of this feedback and to try it again. Furthermore, this research deals with identifying and addressing a problem but the intended final result is not primarily the change of an encountered situation. Therefore, this research is assessed to be interpretative and not critical because the evaluation of the framework is an inter-subjective social construct with multiple views. This research must be qualitative because it aims to capture the multiplicity of perspectives of social actors and the meanings that those actors assign to events. Moreover, it is characterised by an emphasis on the collection and analysis of non-numerical data and it concentrates on investigating subjective data.

A case study strategy is chosen for this research because a case study is particularly useful for practice-based problems, where the experience of the actors is important and the context of action is critical (Lee, 1998; Galliers and Newell, 2001). Furthermore this research uses action research because it aims to contribute to solving an organisation's practical problems and achieve scientific results by joint collaboration between an organisation and the researcher (Rapoport, 1970). Summarising the above considerations, this research study is an interpretative case study with an action research approach. Referring to Table 7, one can formulate the research problem in this study is a design problem, which leads to the conclusion that DBR is an appropriate methodology to address the research problem in this research study. DBR generally emphasises three conceptual elements that correspond with the objectives of this research (compare with the introduction chapter), namely:

- Determine a methodology to address the gap.
- Apply the methodology for bridging the gap.
- Evaluate the solution in a practical setting.

The evaluation of the framework represents a very complex object to study and it therefore requires thorough analysis. Thus, Andriessen's (2006) multiple case and action research-oriented DBR methodology is combined with Reeves (2006) single-case DBR methodology, allowing formulating a single-case DBR methodology for this research, as presented in Figure 10. This methodology includes the four central elements, which are analyse the research problem, develop a design (an initial framework), evaluate and improve it (intermediate framework) and, finally, validate it (the final framework); these elements are visualised in Figure 14 below.

Figure 14. The Four Main Stages of this Research


Critical review of literature
Initial Framework
Expose the framework to critique
Intermediate Framework
Case study & Reflection
Final Framework
Validation of the
Final Framework

The starting point for selecting appropriate data collection methods for this research was to consider what kinds of information are needed. In order to elaborate the information needed for the four phases of this research, specific questions are formulated, as summarised in Table 8. By considering the application, the advantages and disadvantages, specific data collection methods were chosen for each question. This chapter provided a general discussion of the rules for conducting observations, interviews and focus groups; details are given later in Chapter 5. One can summarise that the data in this research is narrative; thus, the data analysis method for this research is a narrative data analysis. The framework from Herman and Vervaeck (2001) was adapted for this research, as indicated in Figure 13. This section concludes with discussing the quality criteria of this research.

The aim of the next chapter is to apply the methodology for bridging the gap. In order to achieve this objective, it will discuss the selection of the organisations willing to apply the initial framework, the planning for the implementation in the case and, finally, the implementation and evaluation of the suggested framework. The intended result of the next chapter is the improvement of the framework.

Chapter 4

Development of the Initial Framework from Literature

Following the research methodology developed in Chapter 3 and summarised in Figure 14, the first step is to develop an initial, tentative KBBPI framework from the published literature.

4.1 Identifying the Elements of a KBBPI framework

As discussed in Chapter 2, Gronau (2005), Maier and Remus (2001) and Strohmaier (2005) argue that a framework for improvement of knowledge-intensive business processes (BPs) from a knowledge management (KM) perspective should include the following functionality:

- *Identification and management of crucial knowledge domains* for the execution of BPs.
- *Identification of knowledge deficits* that can be remedied. This means knowledge workers can be provided with the knowledge that is appropriate to their roles in their corresponding BPs.
- *Identification and management of knowledge processes* (KPs) that can be treated as separate organisational processes.
- *Improvement of and intervention in the KPs.*

Following these arguments, it can be concluded that the main requirement of the KBBPI framework is that it should help to diagnose BPs from a KM perspective and help plan initiatives that improve the efficiency of the BPs. However, the above functionality required of a potential KBBPI framework leads to several key questions:

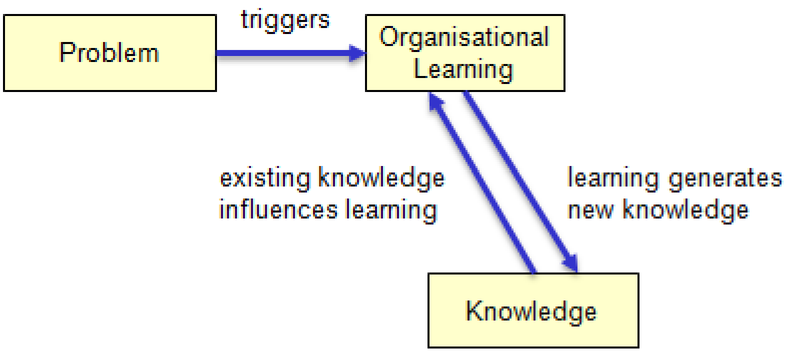
1. What knowledge is relevant for the performance of BPs?
2. How can one identify and provide relevant knowledge?
3. What are “knowledge processes”?
4. How can knowledge processes be improved?
5. What are “Managerial KM Processes”?

The above questions will now be addressed in turn.

4.2 What Knowledge is Relevant for the Performance of Business Processes?

As discussed in Chapter 2, knowledge in this research can be defined as being linked to the ability to solve problems and a prerequisite to the performance of BPs. Dalmaris (2006) presented a principle behind the above interpretation of knowledge, which is shown in Figure 15. The central notion is that a problem triggers the search for an acceptable solution and searching for a solution relates to the use and creation of knowledge. Dalmaris further argues that the problem initiates organisational learning and organisational learning, in turn, generates organisational knowledge, i.e. a potential solution to the problem, before the cycle begins again.

Figure 15. Knowledge as Solution to Problems


Problem
triggers
Organisational Learning
existing knowledge influences learning
learning generates new knowledge
Knowledge

Source: Dalmaris (2006)

In this cyclic process, a proposed solution is tested and repeated until an acceptable solution is created, one that solves the problem. In other words, new knowledge is created in learning and is part of an organisational problem-solving cycle. The generation of knowledge might or might not depend on existing knowledge but, at least, the knowledge will influence the quality of the solution process. One can conclude that, in this view, the role of knowledge is linked to the ability to solve problems and also linked to the generation of new knowledge.

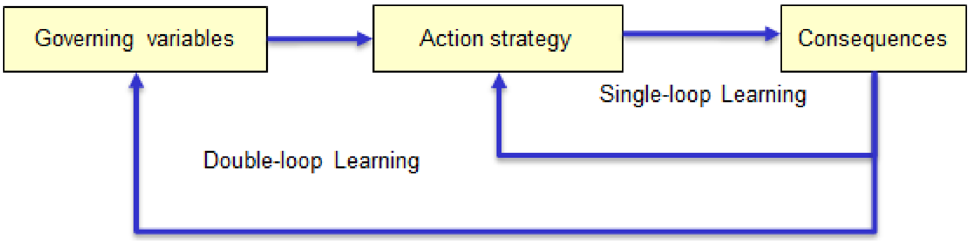
4.2.1 Learning Organisations and Organisational Learning

Senge (1990), in ‘The Fifth Discipline’, defines learning organisations as those that continually enhance their capacity to create the results they really care about. Similarly, Blackman et al. (2004) argue that learning leads to new understandings and expectations – otherwise, it is not learning but utilisation of old knowledge. In their organisational learning (OL) discourse, Argyris and Schön (1978) introduced the notion of single- and double-loop learning to illustrate their concept of adaptive and generative learning. For them, learning involves the detection and correction of errors. Argyris and Schön (1978) distinguish the following aspects in their model:

- *Governing variables*: the context and limits of what learning is acceptable and how much change can be tolerated.
- *Action strategies*: the likely course of action that people or organisations may take.
- *Consequences*: the intended or unintended results of an action.

In this context, Figure 16 illustrates the two modes of learning, single-loop and double-loop.

Figure 16. Single-loop and Double-loop Learning



Source: Dalmaris (2006)

Single-loop learning typically occurs when goals, values, frameworks or (sometimes) strategies are taken for granted (Smith and Argyris, 2001). In other words, single-loop learning typically means measuring a variable and the result may call for an action to change the variable. This change is interpreted as single-loop learning because it is not the whole that changes but only an action which depends on the value of a variable (known as the action strategy). This means that with single-loop learning, errors cause changes to the original action strategy without affecting the fundamental variable assumptions of the action (Dalmaris, 2006). In double-loop learning, the governing variables, in addition to the action strategy, are in question and can be changed. In other words, double-loop learning typically means measuring a variable, after which the results may indicate that the measured variable or the whole procedure be replaced by another variable or a new procedure. This means that not just the details of the execution changes but the whole procedure may also change. The core of double-loop learning considerations is that a learning organisation and OL concern the translation of information (or data) into knowledge and, finally, into business success through individual, team, organisation and wider learning processes.

Although, the mechanism of organisational learning (OL) is comparable to that of individual learning, it is not the same (Fiol and Lyles, 1985). The mechanisms through which individuals or organisations learn have been researched extensively and the idea that an organisation *per se* is able to learn has been problematic for many researchers and subject to debate (Zabresky, 2006).

4.2.2 Individual versus Organisational Learning

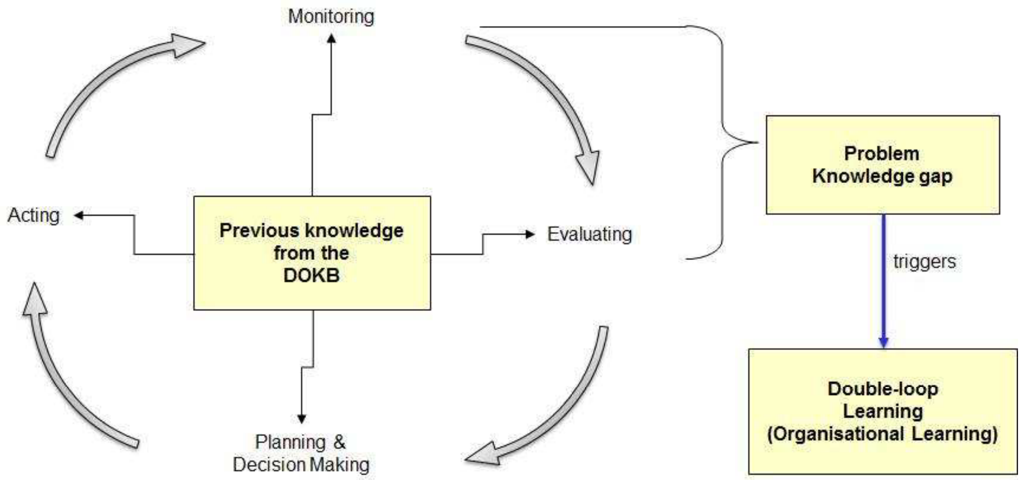
The question is whether organisations are, *per se*, able to learn or whether they depend fully on the learning capabilities of individuals. Sivastva (1983) concluded from early research that OL is wholly dependent on the learning of individuals within the organisation rather than any knowledge sharing or organisational institutionalisation of knowledge. Other authors, such as Spender (1996), are more careful to differentiate between organisational and individual learning and on the interactions of members of the organisation and the social construction of knowledge that occurs as a result.

In partial opposition, Spender (1996) argues that an organisation is capable of activities unlike those of individuals and asserts that organisational properties have no correlation at the individual level. They were, he said, “not summations of individual capabilities but systemic properties that emerged unforeseen at the social level”. He further argues that the interaction of individual and organisational knowledge, both in learning and in memory, is the most vital aspect for actively learning in organisations (see 4.2.1). In this context, the word ‘actively’ means that a learning organisation actively promotes, facilitates and rewards individual and collective learning. In this context, Ang and Joseph (1996) distinguish between OL and a learning organisation in terms of process versus structure. They suggest that organisations, such as a management consultancy, should deal with both process and structure in order to enable OL and to become a learning organisation. Shifting from individual learning to OL involves what an individual learns being made available to others in the organisation, in order to be useful to the organisation. Capturing knowledge could include publications, activity reports, lessons learned and so on and means organising individual knowledge, (as the outcome from learning), in ways that enable people to find it. This also includes storing knowledge in repositories, databases or libraries so that knowledge is available when needed. This could be supported, at least partially, by technology but are primarily social processes within a social environment.

4.2.3 The Knowledge Life Cycle (KLC)

As discussed in section 2.3.4, the new generation of KM (NGKM), as shown in Figure 4, aims to enhance an organisation's capacity to satisfy its demands for new knowledge. Referring to the discussion in section 4.2.2, one can argue that NGKM also satisfies the organisational need for learning. The foundation of the KLC is the so-called decision-execution cycle (Figure 17), which includes planning, acting, monitoring and evaluating behaviours (Firestone and McElroy, 2005). A central element in Firestone and McElroy's (2003a) NGKM is the knowledge life cycle (KLC) (see Figure 18). This presents the notion that knowledge is created in response to organisational need, transferred or shared among organisational agents and then used in decision making.

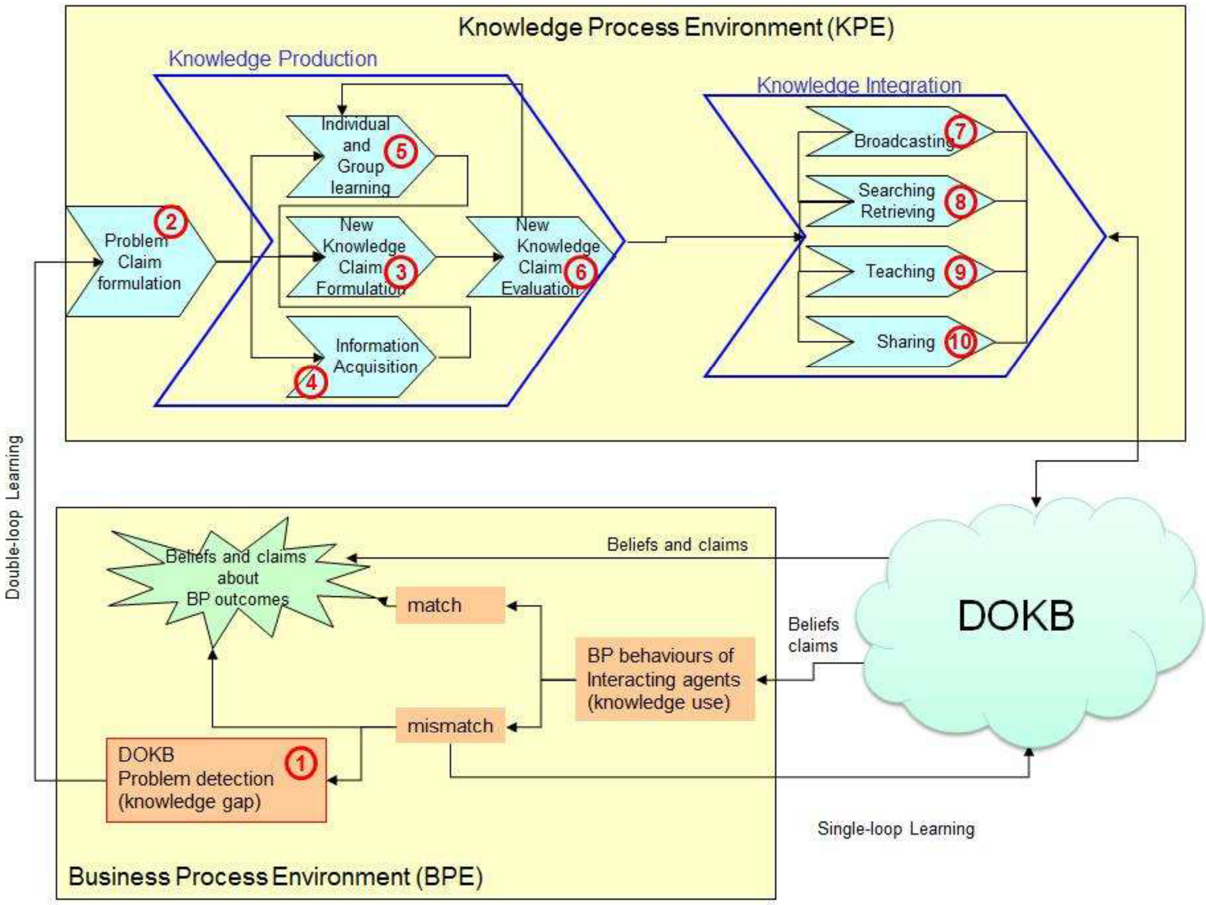
Figure 17. The Decision-Execution Cycle


Monitoring
Acting
Previous knowledge from the DOKB
Evaluating
Planning & Decision Making
Problem Knowledge gap
triggers
Double-loop Learning (Organisational Learning)

Source: Firestone and McElroy (2005)

In the decision-execution cycles (DEC), decisions and actions are accompanied by expectations. "Acting" means that previously existing individual-level knowledge is used to arrive at decisions and actions because, they argue, personal knowledge is always the immediate precursor to action (Firestone and McElroy, 2005). During "Monitoring" and "Evaluating", the individual determines the degree to which results match the expectations that accompany decisions. When the mismatch is great enough from the viewpoint of the individual and when the individual decides that previous knowledge will not reduce the mismatch, the individual recognises that a gap exists between what they know and what she or he needs to know in order to pursue the goal(s) or objective(s) of the associated DECs. Firestone and McElroy (2005) call this knowledge gap a "problem". Based on the principle of the DEC Firestone and McElroy's (2005) knowledge life cycle (Figure 18) specifically refers to BPs.

Figure 18. The Knowledge Life Cycle


Knowledge Process Environment (KPE)
Knowledge Production
Individual and Group learning ⑤
New Knowledge Claim Formulation ③
New Knowledge Claim Evaluation ⑥
Information Acquisition ④
Problem Claim formulation ②
Knowledge Integration
Broadcasting ⑦
Searching Retrieving ⑧
Teaching ⑨
Sharing ⑩
Double-loop Learning
Beliefs and claims about BP outcomes
Beliefs and claims
match
mismatch
BP behaviours of Interacting agents (knowledge use)
Beliefs claims
DOKB
DOKB Problem detection (knowledge gap) ①
Single-loop Learning
Business Process Environment (BPE)

Source: Firestone and McElroy (2005)

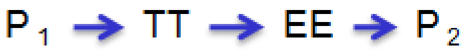
The KLC distinguishes three main elements:

- The *Business Process Environment* (BPE), the operational processes directed at attaining substantive goals.
- The *Knowledge Processes Environment* (KPE), the adaptive processes aimed at fulfilling knowledge-related goals.
- The *Distributed Organisational Knowledge Base* (DOKB), representing the organisational memory and incorporating any kind of organisational knowledge.

At the root of the KLC (and the DEC) is Popper's schema (Figure 19) for the solution of problems.

The starting point for the following discussion is Popper’s (1999) schema of problem solving (see Figure 19). P_1 is a shared problem situation and starting point for formulation of tentative solutions, which incorporate background theories. TT is a tentative theory, an imaginative conjectural solution to the problem. EE is error elimination, involving critical discussion or experimental tests; and P_2 is the resulting outcome, which is a solution to the problem.

Figure 19. Popper's Basic Problem-Solving Schema



Source: Popper (1999)

Corresponding with Popper’s (1999) schema of problem solving (see Figure 19), the KLC (Figure 18) describes a cycle of problem solving consisting of the following sub-processes:

- The *business process environment*, which is the process where the problem (item (1) in Figure 18) occurs.
- *Knowledge production* corresponds to tentative theory development.
- *Knowledge integration* corresponds to error elimination.

Firestone and McElroy (2005) call this mismatch between factual and evaluative perspectives the epistemic gap or the problem and the recognition of such situations is what they mean by problem recognition (item (1) in Figure 18).

When a problem is recognised, the individual has the options of abandoning/suspending, pursuing the problem or engaging in problem solving. In the latter case, the problem claim formulation (shown as (2) in Figure 18) is an attempt to learn and state the specific nature of the detected knowledge gap or problem and is a precursor to knowledge production. Firestone and McElroy (2005) argue that knowledge claims (shown as (3) in Figure 18) are conjectures, assertions, arguments, or theories, about which potential actions might lead to desired outcomes

Knowledge production is the result of double-loop learning. The formulation of possible solutions is the result of the process of knowledge claim formulation and this process is made up of four sub-processes:

- New knowledge claim formulation - item (3) in Figure18.
- Information acquisition - item (4) in Figure18.
- Individual and group learning - item (5) in Figure18.
- New knowledge claim evaluation - item (6) in Figure18.

Item (3), New knowledge claim formulation, follows in response to the problem claims, with input via item (4), information acquisition, and item (5), individual and group learning, all under the influence of content contained in the current DOKB. New knowledge claims are tested and evaluated via item (6), knowledge claim evaluation, using a variety of criteria.

Knowledge claim evaluation may lead to the following types of knowledge claims (Firestone and McElroy, 2005):

- *Surviving:* new organisational knowledge, a "good" or adequate solution.
- *Falsified:* knowledge refuted as a possible solution.
- *Undecided*: unknown whether or not the knowledge is a solution.

The process of knowledge claim evaluation attempts to refute the possible solution. If the possible solution survives enough tests, then the tentative solution is accepted as a good or adequate solution. If, however, the process succeeds in refuting the possible solution, the lessons learned are taught through the individual and group learning process and a new attempt for a possible solution is initiated through the process of knowledge claim formulation. Firestone and McElroy (2003a) further argue that individual/group learning itself is knowledge processing; thus, it produces knowledge claims for consideration at higher levels of analysis and they call this the recursive nesting of knowledge processing in the enterprise.

Once new knowledge is produced, it must be integrated into the distributed organisational knowledge base (DOKB) and both the claims become part of the DOKB via several means of knowledge integration.

Knowledge integration is the process that presents new knowledge to the individuals and groups that comprise the organisation. Knowledge integration is made up of four more sub-processes (again referring to items in Figure 18):

(7) The *knowledge and information broadcasting process* (shown as (7) in Figure 18) involves the dissemination of new knowledge to one or more recipients simultaneously; for example, transmission through emails, presentations or a newsletter.

(8) *Searching/retrieving* (shown as (8) in Figure 18) is the attempt to find knowledge or information that already exists somewhere in the organisation through interaction with humans or searching in, for example, knowledge bases, web sites or specification manuals.

(9) *Teaching* (shown as (9) in Figure 18) involves the capacity for interaction between teacher and student. In contrast to broadcasting, teaching is mostly a unidirectional process; for example, seminars. Teaching, in contrast, is bidirectional and both can be supported by technology.

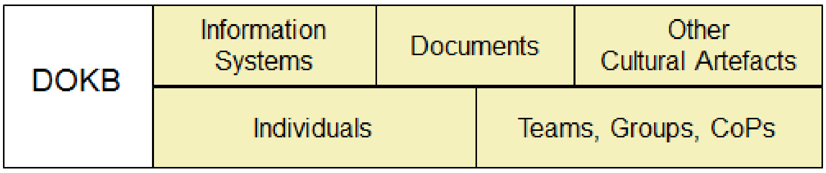
(10) *Knowledge sharing* (shown as (10) in Figure 18) involves the distribution of knowledge to a few individuals, such as colleagues, with whom some common background ensures that this knowledge can be assimilated without the need for teaching.

A further element of the KLC is the distributed organisational knowledge base (DOKB), which is discussed in the next section.

4.2.4 Distributed Organisational Knowledge Base (DOKB)

The DOKB is based on the idea of organisational memory, which relates to many similar or synonymous terms, such as organisational memory, corporate memory, corporate, organisational or enterprise-wide knowledge-base, organisational or corporate knowledge, institutional, and collective or systemic knowledge (Mäkinen, 2004). One can conclude that organisational memory consists of all the active and historical information in an organisation worth sharing, managing and preserving for the future (Megill, 1997). The definitions of organisational memory may vary but the main idea of the concept is to symbolise the management, use and retention of organisational information resources. An important characteristic of organisational memory is that it refers to individuals and groups, as well as to social interaction and information systems. Based on such considerations, Firestone and McElroy (2003) suggested, as part of their KLC, the distributed organisational knowledge base (DOKB) shown in Figure 20.

Figure 20. Distributed Organisational Knowledge Base



Source: Firestone and McElroy (2005)

The DOKB represents the organisational memory and incorporates any kind of organisational knowledge, including business processes, plans, cultural expressions, organisational strategy, policies, procedures, contents of databases, web servers, file servers and the like (Firestone and McElroy, 2003). Figure 20 shows that Firestone and McElroy (2003) distinguished different types of knowledge in the DOKB and argue that the several types of knowledge, represented by the DOKB, are relevant for the performance of BPs.

The central proposition in formulating types of knowledge is that such a distinction leads to more effective means for generating, sharing, and managing knowledge (Orlikowski and Baroudi, 1991). From literature, many classifications and taxonomies of knowledge can be recognised and these are now discussed in Section 4.3.

4.3 How Can One Identify and Provide Relevant Knowledge?

Knowledge taxonomies are very common in KM and the use of taxonomies is the rule rather than the exception (Blackler et al., 1998).

Alavi and Leidner (2001) discussed knowledge taxonomies that included the mode of knowledge creation/existence (mind of the individual, norms of the social collective), knowledge-orientation (know-about, know-how, know-why, know-when, know-with) and pragmatic. Alavi and Leidner's knowledge taxonomies exemplify the complex nature and variety of organisational knowledge. The main purpose of Alavi and Leidner's classification is to put knowledge into context so as to understand how it might be managed using an appropriate system.

Blackler (1995) identified five knowledge types, as shown in Table 9:

Table 9 Blackler's (1995) Types of Knowledge

Knowledge Type	Description
Embodied	Knowledge that is action-oriented and is likely to be only partly explicit; practical thinking.
Embedded	Knowledge that resides in systemic routines; emerges through relationships and material resources.
Embrained	Knowledge that is dependent on conceptual skills and cognitive abilities; abstract thinking.
Encultured	The process of achieving shared understanding; emerges specifically through inter-personal interaction within groups.
Encoded	Information conveyed by signs and symbols; explicit knowledge.

Sheffield et al. (2007) derived, from Blackler's perspective, some relevant consequences:

- Knowledge is only meaningful when interpreted in a specific context; organisations only know what they know when an event occurs that calls for putting organisational knowledge into action.
- Knowledge is not an object to be extracted, transferred, stored and applied.

Blumentritt and Johnston (1999) propose a classification that ranges from “easily transferable codified knowledge” (equivalent to information), via “common knowledge” (that is accepted as standard without having been made explicit) and “social knowledge” (about interpersonal relationships and cultural issues), to “embodied knowledge” (personal experiences and skills).

Hedlund and Nonaka (1993) argue that knowledge can be viewed from three perspectives:

a) Knowledge *as a stock* (focus on storing).
b) Knowledge *as a flow* (focus on transferring).
c) Knowledge *as interactions* (focus on transformation).

Storage indicates that a stock of knowledge resides in a particular person/organisation. Transfer refers to knowledge that is communicated from one unit/person to another. Transformation indicates a process by which knowledge is “added, restructured, re-contextualised, re-interpreted, etc., or through which new knowledge is generated” (Hedlund and Nonaka, 1993).

Biggam (2001) defines three broad types of knowledge:

- factual,
- practical,
- and “of people, places and things”

and suggested some knowledge opposites:

a) *Static vs. dynamic*: dynamic knowledge emphasises that knowledge often changes and is influenced by cultural factors, i.e. it rarely remains fixed.
b) *Internal vs. external*: an organisation’s knowledge can come from inside or outside the firm.
c) *Personal vs. organisational*: organisational knowledge is seen as the collective knowledge of the organisation.

Based on Polanyi's (1967) original concepts, Nonaka and Takeuchi (1995) distinguished tacit from explicit knowledge, which is perhaps the most widely-recognised taxonomy of knowledge in KM.

4.3.1.1 Tacit vs. Explicit Knowledge

Explicit knowledge is defined to be that part of knowledge where what we know can be explained. For example, stating that Zurich is in Switzerland is a piece of explicit knowledge that can be written down, understood and transferred to a recipient. In contrast, tacit knowledge is "all kind of knowledge that a person is not capable of formulating explicitly". For example, the ability to speak a language requires not only the explicit vocabulary and grammar but also knowledge of local usage that is not written down and is more difficult to transfer to other people.

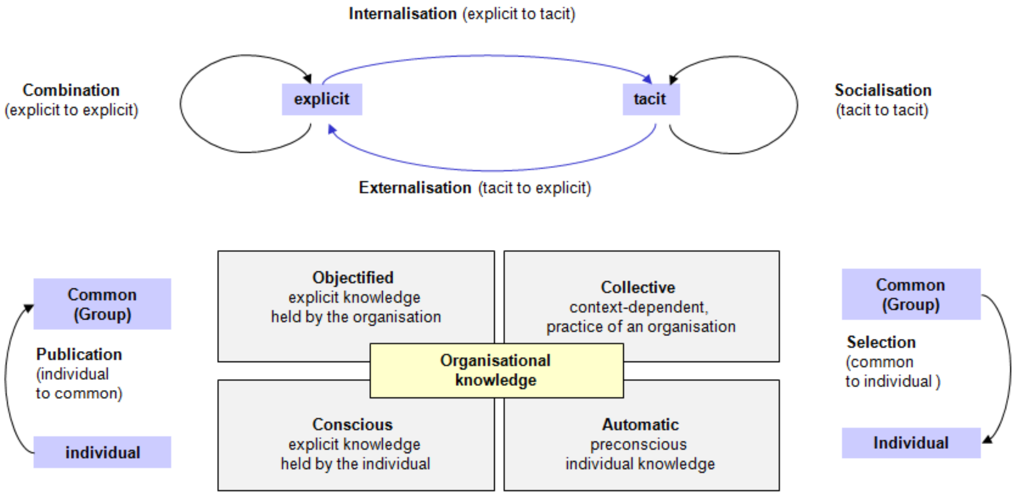
An individual's tacit knowledge includes experiences, actions, values, ideals and emotions. Nonaka and Takeuchi (1995) distinguished tacit knowledge further into two dimensions, the *Technical* dimension, which comprises the skills of 'know-how' and the *Cognitive* dimension, which comprises the mental models an individual acts upon. However, the distinction between *tacit* and *explicit* does not provide an understanding of what constitutes knowledge but recognising that much of what occurs in an organisation remains tacit is an important stage in the goal of exploiting knowledge.

4.3.2 Tacit vs. Explicit and Individual vs. Collective Dichotomy

Based on Nonaka and Takeuchi's (1995) considerations, Spender (1996) arrives at a knowledge taxonomy that combines the explicit-tacit and the individual-group (collective) dimension of knowledge. These two dimensions are of fundamental relevance in KM because they facilitate describing different knowledge transfer levels (see Figure 21). These are the transfer of knowledge between individuals, from individuals to explicit sources, from individuals to groups, between groups, across groups and from the group to the organisation (Alavi and Leidner, 2001).

Spender (1996) combined the tacit-explicit dichotomy with the individual-collective dichotomy to produce a two-by-two matrix with four generic types of knowledge. Based on these considerations, one can combine Spender's matrix with Alavi and Leidner's knowledge transfer-levels (see Figure 21) in order to be able to identify knowledge types, as well as the corresponding knowledge transfer levels.

Figure 21. Tacit-Explicit and Individual-Collective Dichotomy


Internalisation (explicit to tacit)
Combination (explicit to explicit)
explicit
tacit
Socialisation (tacit to tacit)
Externalisation (tacit to explicit)
Common (Group)
Publication (individual to common)
individual
Objectified explicit knowledge held by the organisation
Collective context-dependent, practice of an organisation
Organisational knowledge
Conscious explicit knowledge held by the individual
Automatic preconscious individual knowledge
Common (Group)
Selection (common to individual)
Individual

Spender (1996), distinguishes four types of organisational knowledge, which are conscious (explicit knowledge held by the individual); objectified (explicit knowledge held by the organisation); automatic (preconscious individual knowledge); and collective (highly context-dependent knowledge manifested in the practice of an organisation).

Conscious knowledge is typically available to the individual in the form of facts, concepts, and frameworks that can be stored and retrieved from memory or personal records. This type of knowledge could be exemplified by tools or explicit procedures used to solve practical problems. Such tools or procedures might be policy letter templates, orders formats, training management matrices, etc.

Automatic knowledge often exists in the form of success or failure from which the discerning learner can extract the link between particular situational contexts and the appropriate actions to take in these contexts (Cianciolo et al., 2004; Spender, 1996). Stories may provide an important illustrative context for effectively applying another person's conscious knowledge. Automatic knowledge indicates that some tacit knowledge of an individual can represent personal knowledge that has become "frozen into habit" and might be represented by the application and practice of the skills of craftsmen (Armistead and Meakins, 2002). One can conclude that automatic knowledge, which is inherent in the complex and personal practices and experiences of individuals, is by definition difficult to be communicated or codified.

Objectified knowledge is common and explicit knowledge that is known and understood by everybody in an organisation. In a management consultancy firm, this would include, for example, the strategy, techniques, methods and administrative procedures, among others. Objectified knowledge will have been validated according to institutional standards (Spender, 1996) and will serve multiple functions, such as providing a frame of reference for decision making and taking action, providing a means for holding individuals accountable for their behaviour in the organisation and providing a foundation on which further knowledge is built (Spender, 1996). Spender also observed that firms increasingly try to manage explicit objectified knowledge but remained dependent on their employees' skilled practices, automatic skills and intuitions (tacit knowledge) to maintain their economic existence.

Collective knowledge is more than the sum of individual knowledge. Like the debate about organisational learning (see Section 4.2.1), the question emerges as to whether tacit knowledge can be considered to be collective. Some researchers suggest that collective knowledge is simply based on individual knowledge (Gammelgaard and Ritter, 2005) but Mäki (2008) argues that it is also the capability to integrate and combine knowledge that defines the applicability and value of collective knowledge. If knowledge is characterised as the ability to solve problems and is therefore independent of references to data and information, one can question if tacit knowledge is, in fact, individual. Orlikowski and Baroudi (1991) introduces the idea of "collective competencies", meaning (i.e., sharing identity, interacting face-to-face, aligning effort, learning by doing, and supporting participation) facilitating organisational performance. He goes on to argue that collective competencies are close enough to collective knowledge to allow comparison between these two concepts and justify the existence of collective knowledge. This argument corresponds with the discussion in the previous sections, which could be summarised as "knowledge is the result of social negotiation", drawing on the learning and experience of individuals in manipulating the real world

As a result, practice knowledge creation is focused on experience, learning and communication. In this perspective, the focus is shifted from the individual context to the community context and, consequently, it can be argued that the community represents a kind of organisational knowledge.

4.3.3 Communities of Practice as a Form of Collective Knowledge

Lave and Wenger (1998) define communities of practice (CoPs) as groups of people, who focus on the practices of individuals, engage in the same practice and communicate regularly with one another about their activities. They are different from teams and functional units because CoPs are self-organising systems whose lifespan is determined by their members. CoPs are described as differing also from traditional team-working approaches in that they are most likely to be cross-functional and multi-skilled where functional position is irrelevant and topic knowledge or interest is all that is necessary to join (Lehaney, 2004).

Lehaney (2004) further argues that important CoP attributes are:

- *Variety*: multi-skilling prevents boredom and monotony, and builds flexibility.
- *Identity*: building an identity encourages a sense of collective responsibility and a self-regulation of variances.
- *Significance*: motivation to care about the outcome of the work process increases co-operation when the outcome is imbued with a sense of significance.
- *Autonomy*: increasing the ownership and responsibility of members to the process enables the group to make decisions under changing environmental conditions; the multi-skilling also enables them to flex attributes and change working practices to fit with the environmental changes.
- *Feedback*: understanding and measuring the results of work processes enables groups to monitor their progress against targets and improve their performance.

Wenger (1998) adds the attribute that such communities are not constrained by time and space and therefore can span organisational boundaries.

Nichols (2003) identifies two types of CoPs, self-organising CoPs and sponsored CoPs:

- *Self-organising CoPs* pursue the shared interests of the group's members and add value to a company in general by learning from each other. Learning is enabled, for example, by sharing lessons learned, acting as distribution points for best and emerging practices etc. Self-organising CoPs are flexible because members are free to come and go as interests and issues shift. Self-organising CoPs are also fragile because attempts to manage or control them can result in the group members disbanding or going ‘underground’ instead of sharing their expertise and knowledge more broadly (Nichols, 2003).

- *Sponsored CoPs* are initiated, chartered and supported by management and are expected to produce measurable results that benefit the company (Antonova, 2006). This type of CoP is often organised in the form of projects. They receive the required resources and have more formal roles and responsibilities (Nichols, 2003). Nevertheless, they are more autonomous than the typical cross-functional project teams.

In CoPs, there is not only a stock of common knowledge but also a sense of collective identity and some overlapping, common values. Such communities are thus able to add context to existing static knowledge repositories. In consequence, the common knowledge, combined with the collective identity and shared values, can create a connection that may facilitate group learning and knowledge sharing. In this sense, CoPs help to overcome barriers to knowledge-sharing in organisations and one can conclude that CoPs can be a pragmatic and efficient solution to an organisation’s knowledge-sharing/management problems (Wenger et al., 2000).

4.3.4 Organisational Culture as a Form of Collective Knowledge

Schein (1988) defined organisational culture as “the pattern of basic assumptions invented, discovered or developed by a given group as it learns to cope with its problems of external adaptation and internal integration”. It provides rules or frameworks to individuals in an organisation, which worked well enough in the past to be considered valid and, therefore, can be taught to new members as the correct way to perceive, think and feel in relation to those problems (Schein, 1988).

Organisational culture includes artefacts, behaviours, values, emotions and motivational roots (Hawkins, 1997). Hofstede et al. (1990) characterise culture as being holistic, historically determined, socially constructed, and difficult to change. Although every organisation has its own culture, almost all organisations do not create their culture consciously; instead, it is built and ingrained unconsciously (Dalkir, 2005).

Organisational culture includes a significant amount of tacit knowledge, historically accumulated and fundamentally accepted by individuals. It includes the deeply embedded notions that motivate people's loyalty to certain values, that trigger their emotions and that foster their motivation (Joglar et al., 2007).

Consequently, if the cultural imprint on an organisation's members is strong enough, knowledge interpretation may be shaped by the uniformity of prior cognitive maps possessed by organisational units (Huber, 1991) or the degree of shared context between interchanging agents (Alavi and Leidner, 2001). Thus, because cultures tend to foster environments with similar cognitive maps, the result of such behaviour is higher degrees of shared interpretation throughout the organisation because values, emotions and motivational factors will be similar (Joglar et al., 2007). Consequently, a strong culture enables a thorough understanding with diminished knowledge codification, since much of the information related to values and emotions is already engraved on what Joglar et al. (2007) term "interchanging agents". In this sense, organisational culture is interpreted as tacit collective knowledge with a strong impact on knowledge-sharing in the organisation.

4.3.5 First Step in Developing the KBBPI Framework

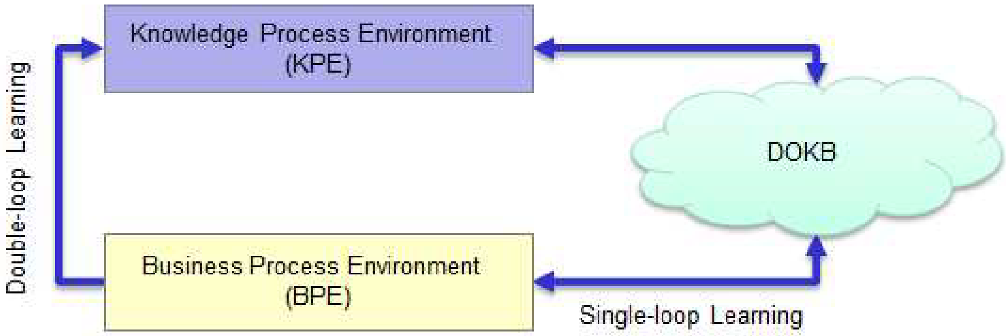
So far, this literature review has focused on two questions:

1. What knowledge is relevant for the performance of BPs?
2. How can one identify and provide relevant knowledge?

In answering the first question, one can argue that the relevant knowledge in BPs is the knowledge required to execute them properly. The second question can be answered by Firestone and McElroy's (2003) knowledge life cycle (KLC) (see Figure 18).

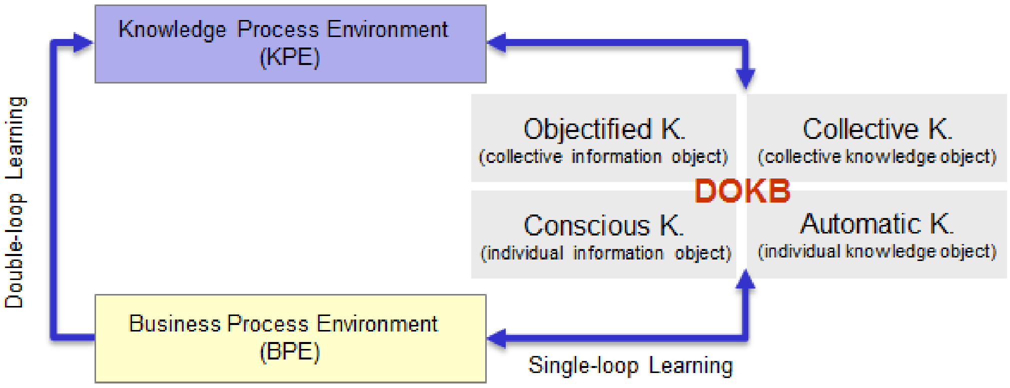
The KLC suggests that the relevant knowledge for the execution of the BPs is in the DOKB which, in turn, represents the organisational memory and incorporates any kind of organisational knowledge. Thus, one can distinguish in the DOKB different type of knowledge and this helps in identifying, generating and managing knowledge *per se*. With these initial findings, one can formulate the initial components of the KBBPI framework. The starting point is Firestone and McElroy's (2003), which is presented in Figure 22 in a simplified version with its three main elements the KPE, BPE and DOKB.

Figure 22. The Simplified KLC


Knowledge Process Environment (KPE)
DOKB
Business Process Environment (BPE)
Double-loop Learning
Single-loop Learning

As discussed earlier, Spender's (1996) knowledge taxonomy combines the explicit-tacit with the individual-group dimensions (see Figure 21) and represents all types of organisational knowledge. Thus, the content of the DOKB could be represented by the four different types of knowledge from Spender's knowledge taxonomy. This representation of the DOKB through the knowledge types from Spender's taxonomy leads to more effective means for generating, sharing and managing knowledge, which is shown in Figure 23, by representing the DOKB through his four knowledge types.

Figure 23. First Step in Developing the KBBPI-Framework


Knowledge Process Environment (KPE)
Objectified K. (collective information object)
Collective K. (collective knowledge object)
DOKB
Conscious K. (individual information object)
Automatic K. (individual knowledge object)
Business Process Environment (BPE)
Double-loop Learning
Single-loop Learning

The two dimensions from Spender's knowledge taxonomy are of fundamental relevance in KM because they facilitate describing the different knowledge transfer levels. These are transfer of knowledge between individuals, from individuals to explicit sources, from individuals to groups, between groups, across groups and from the group to the organisation (Alavi and Leidner, 2001).

These knowledge transfer levels of explicit/tacit knowledge between individuals/groups relate to knowledge processes and to the next questions from Section 4.1:

3. What are knowledge processes?
4. How can knowledge processes be improved?

Potential answers to the above questions are discussed in detail in the following sections.

4.4 What are Knowledge Processes?

The literature on KM has identified numerous different KPs. Despite the great number of different knowledge processes, it is possible to find similarities between the models and processes; some of the differently named processes seem to be remarkably similar. For example, knowledge creation and knowledge generation are often used as synonyms, as are knowledge sharing and knowledge transfer and knowledge connection and knowledge integration. In addition, different authors have different temporal orders for the knowledge processes, indicating that knowledge processes are difficult to separate from each other and overlap in time. Notably, the studies on knowledge processes have been conducted in different contexts, which may have generated different perspectives on knowledge processes.

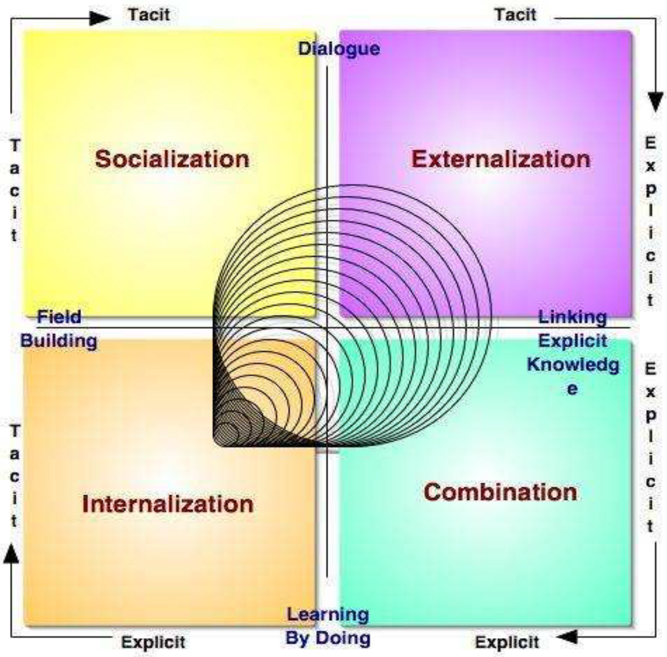
4.4.1 Examples of Prominent Knowledge-Process Frameworks

Reviewing some examples of KP frameworks, that of Nonaka and Takeuchi (1995) has had the greater impact in the research and practice. They argue that knowledge creation is a two-dimensional process.

- The first dimension is the epistemological dimension, in which knowledge conversion takes place between tacit knowledge and explicit knowledge. The result of such conversion is the creation of new knowledge.
- The second dimension of the knowledge creation process is the ontological dimension, in which the knowledge created by individuals is transformed into knowledge at the group and organisational levels.

In this process, four modes of knowledge conversion are at work (Figure 24).

Figure 24. Four Modes of Knowledge Conversion; the SECI Process


Tacit
Tacit
Dialogue
Socialization
Externalization
Tacit
Explicit
Field Building
Linking Explicit Knowledge
Tacit
Explicit
Internalization
Combination
Learning By Doing
Explicit
Explicit

Source: Nonaka and Takeuchi (1995)

The four modes of knowledge conversion, abbreviated SECI, in the Nonaka and Takeuchi model are:

- *Socialisation* (tacit to tacit) is directly connected with theories of group processes and organisational culture. Interviewing and focus groups are research techniques enabling this transfer, by sharing experiences and creating tacit knowledge.
- *Externalisation* (tacit to explicit) is also readily understood as part of the research process in which tacit knowledge can be articulated into explicit concepts and the reconfiguration of existing information can lead to new knowledge in the form of written research reports.
- *Combination* (explicit to explicit) includes collecting relevant knowledge and editing and disseminating it, allowing knowledge transfer across organisations.
- *Internalisation* (explicit to tacit) reflects organisational members acquiring the essential knowledge to make them effective in the organisation.

The SECI process begins with the tacit knowledge of one or several individuals, who share their knowledge with others and thereby develop a common understanding. This common understanding is transformed into explicit knowledge in the form of a concept in the second phase of the process. Through discussion and reflection, tacit knowledge is transformed into explicit knowledge. In the third phase, the emerged concept is justified by comparing and linking it to other explicit knowledge both within and outside the organisation. In the fourth phase, the concept is materialised into an archetype, such as a prototype or a model operating procedure that can be further discussed and tested. In the final stage, the knowledge is cross-levelled, leading to new spirals of knowledge creation elsewhere in the organisation.

Other scholars define different stages without raising an iterative cycle; for example, Tannenbaum et al. (1995) suggests four KPs, namely:

1. *Knowledge sharing* is the extent to which people share their knowledge.
2. *Knowledge accessibility* is the extent to which people have access to the information they need to make decisions, solve problems, and perform job tasks and service customers.
3. *Knowledge assimilation* is the extent to which people learn or assimilate the knowledge they need to perform well.
4. *Knowledge application* is the extent to which people apply or use knowledge to effectively make decisions, solve problems and service customers.

In the view of Tannenbaum et al. (2000), each of the above KPs contributes to knowledge application.

Some authors argue in the same way as the Nonaka and Takeuchi model; for example, Probst et al. (2002) see a dynamic cycle that is in permanent evolution. They suggest eight components that form two cycles, one inner cycle and the other an outer cycle; the inner cycle is composed of:

- *Identification* is the process in which external knowledge for analysing and describing the company’s knowledge environment is identified.
- *Acquisition* refers to the forms of expertise that the company should acquire

from outside through relationships with customers, suppliers, competitors and partners in co-operative ventures.

- *Development* is a building block which complements knowledge acquisition. Its focus is on generating new skills, new products, better ideas and more efficient processes. Knowledge development includes all management efforts consciously aimed at producing capabilities.
- Distribution is the process of sharing and spreading knowledge which is already present within the organisation.
- Utilisation consists of carrying out activities to make sure that the knowledge present in the organisation is applied productively for the benefit its.
- Preservation is the process where takes place the selective retention of information, documents and experienced required by management.

There are two other processes in the outer cycle:

- Knowledge goals determine which capabilities should be built on which level.
- Knowledge assessment completes the cycle, providing the essential data for strategic control of knowledge management.

A further prominent KP framework is the KLC of Firestone and McElroy (2003) already discussed. In this model, there are two main KPs, namely knowledge production and knowledge integration. Knowledge production is made up of four sub-processes, which are new knowledge claim formulation, information acquisition, individual and group learning and new knowledge claim evaluation. Once new knowledge is produced, it must be integrated into the DOKB via several means of knowledge integration, made up of four more sub-processes: knowledge and information broadcasting, searching/retrieving, teaching, and knowledge sharing.

One of the most complete investigations of KPs was by Graham et al. (2006). They present a general KP model based on a review of 60 KP frameworks. Table 10 compares the Graham et al. (2006) general model with the KPs from the KLC model of Firestone and McElroy (2003a), which is a central component of this research.

Table 10 Comparison of Knowledge Process Frameworks

The Generic KP Framework Defined by Graham et al. (2006)	KPs as Defined by Firestone and McElroy (2004)
1. Identification of the problem	Problem with existing knowledge (from the DOKB) experienced in the BP environment
2.1Identification	Problem claim formulation Knowledge production - Information acquisition - Organisational learning (new knowledge generation) - Formulation of new knowledge claims - Evaluation of knowledge claims
2.2 Review	
2.3 Choice of appropriate knowledge	
3. Adaptation to the local context	
4. Assessment of obstacles	
5.1 Selection	Knowledge integration - Sharing - Searching/retrieving - Broadcasting - Teaching
5.2 Adaptation	
5.3 Implementation of interventions	
6. Utilisation is monitored	
7. Assessment of results obtained after knowledge utilisation	Included in the evaluation of the business process environment
8. Continuous knowledge utilisation support	

Graham et al. (2006) refer in their KP framework (see Table 10) to first generation knowledge management (FGKM) because they assume at the beginning some existing knowledge, which potentially provides a solution to a problem. In contrast to this, the KPs in Firestone and McElroy's (2004) next generation knowledge management (NGKM) differ by the assumption that knowledge not only exists but is continuously created by human agents in response to the adaptive needs of organisations. Consequently, the KPs in the above two frameworks differ in sequence and names but the major difference is that, in the NGKM, the KPs fulfil both the demand for knowledge, as well as its supply. Firestone and McElroy, 2004 argue that KPs are adaptive processes aimed at fulfilling knowledge-related goals and they distinguish knowledge production and knowledge integration in the DOKB. In the context of this research, the definition of KPs from Firestone and McElroy (2003a) is useful due its specific focus on the DOKB and BPs.

4.5 How Can Knowledge Processes be Improved?

The starting point to answer this question will be the literature on knowledge sharing. Knowledge sharing is a special process in the KP frameworks because it is difficult to distinguish as a single knowledge process amongst other knowledge processes. For example, knowledge generation, in the context of a group of people, definitely includes knowledge sharing; therefore, knowledge sharing cannot be separated from knowledge generation. Firestone and McElroy (2003a) argue in this context that individual and group learning produces knowledge from the viewpoint of nested knowledge processes. This means that each KP itself could include sub-KPs and so on. Thus, one can argue that, in an organisational context, most KPs include knowledge sharing because, in organisations, more than one person is involved in the KPs. Several researchers, such as Barnard (2003) and Davenport and Prusak (1998), argue that knowledge sharing represents the human factor in KM; thus, knowledge sharing, with its enablers and barriers, are of prominent relevance for KPs.

4.5.1 Knowledge Sharing and Knowledge Transfer

Literature provides several definitions of knowledge sharing, for example:

- Knowledge sharing refers to the “process of capturing knowledge or moving knowledge from a source unit to a recipient unit” (Conolly et al., 2005).
- Knowledge sharing is “a process whereby a resource is given by one part and received by another and for sharing to occur, there must be exchange” (Sharratt and Usoro, 2003).
- Knowledge sharing refers to the “exchange of knowledge between at least two parties in a reciprocal process allowing reshape and sense-making of the knowledge in the new context” (Willem, 2001).

From the above definitions, it can be concluded that knowledge sharing refers to:

a) Knowledge transfer.
b) A social-relational process through which individuals try to establish a shared understanding about reality.
c) The ability to transform this understanding into (collaborative) actions.

While communication/exchange/transfer of knowledge is important, it is the processes of knowledge sharing that determine whether organisational learning occurs. This means that knowledge transfer is an integral part of knowledge sharing but not synonymous. Consequently, knowledge sharing is more than knowledge transfer because knowledge sharing includes learning and translation into action.

Knowledge transfer means bridging the gap between knowledge seekers and knowledge sources (Antonova, 2006). Graham et al. (2006) define knowledge transfer as a systematic approach to obtain, gather, and share tacit knowledge and convert it into explicit knowledge. Therefore, it is a process that facilitates access by individuals and/or organisations to essential information that has, up until now, been the preserve of just one person or a small group of persons (Graham et al., 2006). Cavusgil et al. (2003) define knowledge transfer as the process of transferring information from one or many individuals to another or many individuals such that it results in the creation of new knowledge. Den Hertog and Bilderbeek (1998) argue that many theorists replace knowledge transfer with synonyms like knowledge dissemination, knowledge exchange or knowledge distribution. However, the majority of these definitions depict knowledge transfer as a process, i.e. the mechanisms through which knowledge is developed and provided.

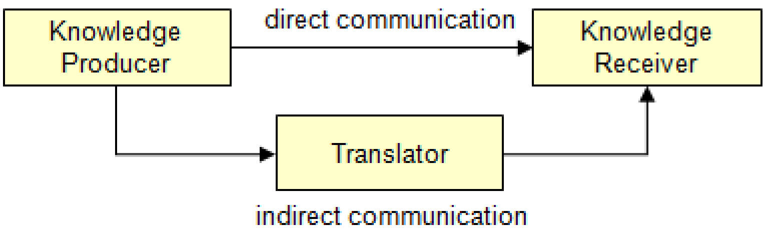
One can distinguish intra-organisational and inter-organisational knowledge transfer. Inter-organisational knowledge transfer means knowledge dissemination within a pool of companies through various methods, e.g. alliances, joint ventures and networks (Berthon, 2003). (Note: This type of knowledge transfer is not within the scope of this research). Intra-organisational refers to knowledge transfer within the same organisation (Berthon, 2003).

Den Hertog and Bilderbeek (1998) define three basic forms of knowledge transfer processes, which are linear, bi-directional and interactive.

4.5.2 Types of Knowledge Transfer Models

In its simplest form, the process is a linear (unidirectional) process (Figure 25).

Figure 25. Linear (unidirectional) Knowledge Transfer Model



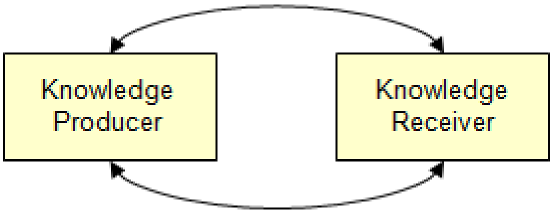
Source: Den Hertog and Bilderbeek (1998)

In this model, knowledge is passed in one direction from producers to users, either directly or through translating agents responsible for disseminating the knowledge (Roy et al., 1995). In principle, the role of the translators could be one for any organisational unit, e.g. administrators, human resource managers. However, in most of these linear models, the role of translators remains limited.

The knowledge transfer process could be in two forms, direct and indirect. Direct knowledge transfer is based on interaction in the form of intra-organisational communication (Cavusgil et al., 2003). Indirect knowledge transfer is through the use of information technology; for example, data bases created by one person/group and used by another person/group in the organisation (Bennet and Bennet, 2004). Such models are criticised because user requirements and realities are barely taken into account, if at all (Faye et al., 2008). In such models, the influence of context and individual characteristics on the process or on the purpose of the transfer is absent (Lyons and Warner, 2005).

In contrast, collaborative knowledge transfer models recognise the interactions between knowledge producers and users, as well as the integration of user requirements. In such models, the exchange flow is simply bi-directional and thus the role of the user is more important, (Figure 26).

Figure 26. Collaborative Knowledge Transfer Model

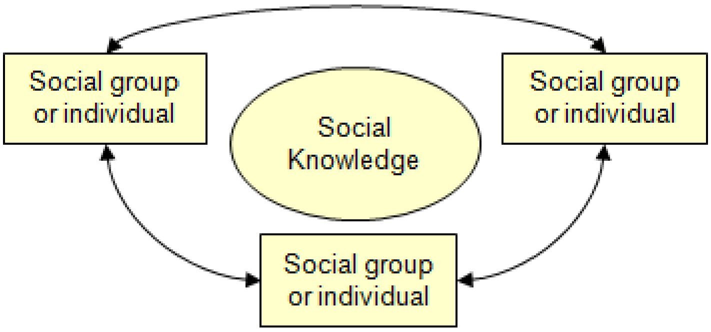

Knowledge Producer
Knowledge Receiver

Source: Den Hertog and Bilderbeek (1998)

If the development over time in such models is considered, then knowledge transfer could be characterised by a continuous and progressive flow of exchange flows between knowledge producer and receiver.

Logically, the next step is the inter-actionist models, discussed by Den Hertog and Bilderbeek (1998) and shown in Figure 27. The exchange flows are usually circular and the existence of collaborative relationships between a set of participants, as well as the context, are recognised.

Figure 27. Inter-Actionist Knowledge Transfer Model


Social group or individual
Social Knowledge
Social group or individual
Social group or individual

Source: Den Hertog and Bilderbeek (1998)

In such models, the interaction process between various social groups, e.g. consultants, managers, and administration, is central and results in exchange networks. These models describe situations in which social participants (group or individual) exchange knowledge that can be improved by feedback from other social participants through exchange channels.

4.5.3 Types of Knowledge in Knowledge Transfer

The type of knowledge transferred is considered to be explicit or tacit, as discussed earlier; potentially, both types of knowledge could be transferred during interactions. In general, sharing explicit knowledge is seen as being straightforward, while sharing tacit knowledge is regarded to be time-consuming, difficult and complex. In this context, the objectivist perspective on explicit knowledge suggests that an isolated sender transfers the explicit, codified knowledge to a separate receiver. In this model, it is assumed that the sender formulates explicit knowledge and transfers it to the receiver and, additionally, that the same meaning is derived without losing any important aspects of the knowledge during the transfer process.

The objectivist perspective focuses on converting tacit knowledge into explicit knowledge and then sharing it, instead of having a model for sharing tacit knowledge. Consequently, from this perspective, sharing tacit knowledge is ignored because tacit knowledge can be converted into the explicit form and shared as explicit knowledge. Thus, from this view, technology plays an important role in providing knowledge repositories (e.g. databases, systems to organise knowledge effectively) and ways of transferring and extracting knowledge. Consequently, the focus is on encouraging employees to codify, collect their knowledge and to create technological support for search and retrieval of knowledge.

From the practice-based perspective on knowledge sharing, it is required that the sender and receiver have an understanding of the values and assumptions of each other in order to transfer and receive knowledge. Consequently, this necessitates an extensive amount of social interaction and communication, causing dialogue and language to be emphasised. In this perspective, the focus is on encouraging and facilitating communication and interaction between individuals by developing a culture fostering and rewarding knowledge sharing. Cavusgil et al. (2003) suggest that the transfer of tacit knowledge relies on close and frequent interactions; therefore, the frequency of interactions could be an indicator as to whether or not tacit knowledge is transferred.

One can summarise that knowledge transfer takes place during interaction in the form of communication between people and may include both explicit and tacit knowledge types. Organisational knowledge transfer refers to acquired knowledge or skills that are regarded as a resource to be shared and applied within an organisation in order to improve performance.

In the following section, the factors impacting knowledge transfer processes are discussed in detail.

4.5.4 Knowledge Sharing Barriers and Enablers

Research concerning the factors affecting knowledge sharing has identified a number of different factors, e.g. technologies, tools, motivations, communication, trust and culture. The following Table 11 summarises some often cited examples of categorisations of knowledge sharing barriers.

Table 11 Categories of Knowledge Sharing Barriers

Husted and Michailova (2002)	Hildreth and Kimble (2004)	Huber (2001)	Sveiby and Simons (2002)
Loss of "hard won" knowledge, value, and power	Lack of awareness	Knowledge transfer problem	No support systems
Reluctance to spend time	Lack of access, the time and space to share	Knowledge coordination problem	Lack of training
Fear of hosting "knowledge parasites"	Lack of application, common content and understanding	Knowledge re-use problem	Job security
Avoidance of exposure	Lack of perception, sharing is respected and valued	Knowledge contextualisation Problem	Employee competition
Strategy against uncertainty			Organisational culture
High respect for hierarchy and formal power			Lack of recognition

In the examples given in Table 11, the focus is on barriers to knowledge sharing. With a similar focus on barriers, Hansen and Nohria (2004) identified knowledge sharing problems relating to the seeker or the provider of knowledge and to their ability or willingness to share knowledge:

a) *"Not invented here" problem*: an unwillingness to seek or receive knowledge.
b) *"Needle in the haystack" problem*: the source and receiver of knowledge do not know each other.
c) *"Hoarding of expertise" problem*: not willing to share knowledge.
d) *"Stranger" problem*: a mismatch understanding between source and receiver.

One can conclude that the challenges of knowledge sharing can point to the lack of motivation to receive or provide knowledge, to the inability to find the knowledge sources in the first place, or to the inability to absorb and interpret the transferred knowledge. Several authors, such as Ipe (2003), Gouza (2006) and (Szulanski, 1996), make a more detailed distinction between enablers, barriers to knowledge sharing and sets of general factors with an unspecific or changing impact on knowledge sharing. For example, Ipe (2003) identified four sets of factors, which are the nature of knowledge, the motivation, the opportunities and the culture. Furthermore, Gouza (2006) and (Szulanski, 1996) previously, argued that the majority of studies on knowledge sharing include the following main sets of influencing factors (being both enablers and barriers):

- The knowledge *per se*.
- The knowledge *producer*.
- The knowledge *recipient*.
- The *context* in which the knowledge sharing takes place.

4.5.4.1 Knowledge as Enabler/Barrier

Holsapple and Joshi (2003) identified 23 attributes of knowledge, which include mode (tacit vs. explicit), applicability (local vs. global), accessibility (public vs. private) and immediacy (latent vs. currently actionable). Gouza (2006), Szulanski, (2000) and Wasko and Faraj (2000) suggested three knowledge attributes:

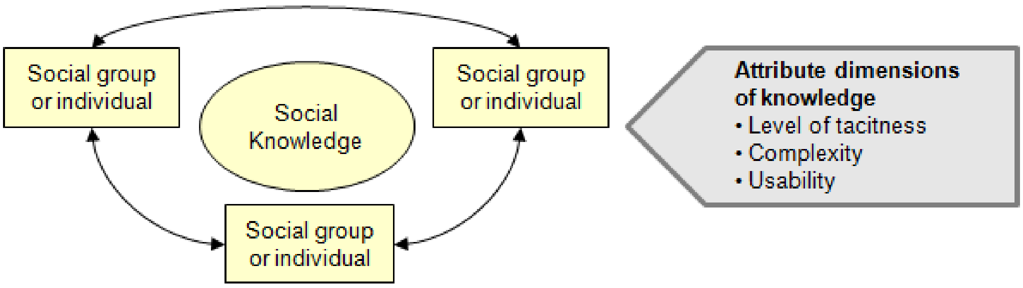
- *Tacitness*, which means the amount of tacit knowledge.
- *Complexity* (individual vs. collective; level of distribution).
- *Quality* (ambiguity, consistency).

As discussed earlier, whether knowledge is an enabler or a barrier strongly depends on the level of tacitness. The level of tacitness means the amount of tacit knowledge on an individual and collective level that can be challenging to share due to the difficulty of articulating and receiving it. Thus, there is the need for an interactive channel between the source and the receiver. One can conclude that the higher the level of tacitness, the more challenging knowledge transfer becomes and the higher the need for interaction between source and receiver. In other words, if knowledge can be codified and articulated, knowledge can be shared better and faster.

Another characteristic of knowledge influencing knowledge sharing is its complexity. Complexity here refers to the number of interdependent technologies, routines, individuals, and resources linked to a particular knowledge object (Simonin, 1999). Complexity of knowledge often means that the totality of the knowledge cannot be easily integrated or understood (Simonin, 1999). Complexity also refers to the degree of distribution of knowledge among individuals or groups.

Knowledge of low quality, e.g. ambiguous or inconsistent, also negatively impacts its sharing. Here, quality of knowledge means the usability to some processor in the sense of having sufficient validity (e.g., accuracy, certainty, consistency) and utility (e.g., clarity, meaning, relevance, importance) for sense making (Holsapple and Joshi, 2003). Therefore, for a given knowledge object, usability can vary from one processor to another, from one situation to another and from one time to another (Holsapple and Joshi, 2003). Figure 28 summarises and illustrates these considerations.

Figure 28. Knowledge Attributes as Enabler and Barriers


Social group or individual
Social Knowledge
Social group or individual
Social group or individual
Attribute dimensions of knowledge
• Level of tacitness
• Complexity
• Usability

Thus, one can argue that knowledge sharing is negatively affected by:

- A *high level of tacitness* of knowledge.
- A *high level of complexity* of knowledge.
- *Low usability* of knowledge.

In contrast, the positive attributes are that knowledge should be explicit (easily available and accessible), usable (appropriate, consistent, recognised and understood) and not distributed among many different knowledge resources.

4.5.4.2 Knowledge Producer and Receiver as Enabler and Barrier

Both the receiver and producer can be an individual, group or automated entity (Schutte, 2007). Choo (2008) elaborated the influencing factors regarding the knowledge producer and receiver, as shown in Table 12:

Table 12 Individual and Interpersonal Factors

	Knowledge Producer	Knowledge Receiver
Individual factors	Perceived benefit of sharing knowledge relative to cost, effort	Perceived benefit of seeking knowledge relative to cost, effort
	Intrinsic, extrinsic motivation	Need to accomplish task
	Information stickiness, effort needed to transfer knowledge	Absorptive capacity, effort to understand, to apply (new) knowledge
	Commitment to the organisation	Commitment to the organisation
Interpersonal factors	Strength and quality of social ties, norms of trust, reciprocity	Strength and quality of social ties, norms of trust, reciprocity
	Degree of trust - belief in the other party's good intent, capability	Degree of trust - belief in the other party's competence, reliability, openness
	Concern about loss of ownership over valuable knowledge (loss of power)	Resistance to knowledge from outside (the group); "not invented here" problem

Source: Choo (2008)

Many of the factors in Table 12 can be explained by the relationship between knowledge producer and receiver. Choo (2008) argues that knowledge sharing is goal-oriented and based on rational choice, which means that individuals interact with others based on a self-interested analysis of the perceived benefits and costs. Prusak and Cohen (2001) and Cohen and Levinthal (1990) argue that knowledge sharing depends on the relationship between individuals, resulting in the motivation to cooperate.

On the one hand, if explicit knowledge is shared from an individual or a collective, no high interaction with other people is necessarily needed. On the other hand, transferring tacit knowledge cannot be approached without high interaction between the members of an organisation. Thus, the relationship between individuals is especially important for the transfer of tacit knowledge (Szulanski, 1996). Boer (2005) further argues that the knowledge sharing depends on the existence of four fundamental forms of human relationships:

- In *communal sharing relationships*, the members of a group treat each other as equals and, thus, the members of such a group are relatively kind and altruistic to people of their own kind. In such relationships, some sources might commit themselves to share, owing to their reputation and role as experts and mentors, and might feel pride and satisfaction through contributing to their community.
- *Authority ranking relationships* are based on a model of asymmetry among people, ordered along some hierarchical social dimension. When people are thinking in terms of such linearly ordered structures, they treat higher ranks as betters. Knowledge sharing motivated by authority ranking relationships within an organisation is asymmetric and unequal. Thus, knowledge is often perceived as a means for displaying rank differences; for example, formal power, expertise or age (Huber, 1982). This might imply a knowledge asymmetry in which not everybody is equally well informed. A consequence of authority ranking relationships could be that the higher the rank, the more the access to better knowledge and the lower the status or power, the least informed.
- In *equality matching relationships*, the idea is that each person is entitled to the same amount as each other person in the relationship. In such relationships, people value fairness and strongly prefer receiving at least as much as their partners. For example, such motivation can refer to the view that knowledge, as a public good, does not belong only to one individual or it can be seen as an

opportunity to give something back to the community.

- *Market pricing relationships* concern how a person stands in relationships to others. Such interactions are oriented towards cost-benefit ratios and rational calculations of efficiency or expected utility. Market pricing relationships, as motivation for knowledge sharing, imply reciprocity; people are willing to share their knowledge if they get something back in return (Watson and Hewett 2006). For example, such knowledge sharing could be motivated by the desire for recognition as an expert.

Some authors, such as Adler and Kwon (2002), argue that any relation is likely to involve a mix of such types. For example, the relation between colleagues often combines communal sharing with equality matching; the employer-employee relation often includes characteristics of authority ranking and market pricing. These four fundamental forms of human relationships allow categorisation of the reasons why people might be willing to share their knowledge. This helps to analyse the motivations, the willingness from people to share knowledge. Based on the four fundamental forms of human relationships, Ford and Staples (2008) suggest a framework describing four separate forms of behaviour:

- *Full knowledge sharing* (in which an individual or a group shares all relevant knowledge).
- *Partial knowledge sharing/hiding* (in which an individual or a group shares some but not all relevant knowledge).
- *Active knowledge hoarding* (in which an individual or a group actively withholds all relevant knowledge).
- *Disengagement* (where an individual or group neither actively seeks to share nor to withhold knowledge).

In addition, von Hippel (1998) defined knowledge ‘stickiness’ as the incremental expenditure required to transfer a unit of information to a specified point in a form useable by a given information seeker. Knowledge stickiness, for example, means that consultants can be viable as their knowledge is sticky, i.e. the fees associated with transferring their knowledge are high. Thus, knowledge stickiness is a core characteristic of specialised, personal, tacit knowledge that inhibits easy transfer

(Szulanski, 1996; von Hippel, 1998).

In the context of individual factors, Szulanski (2003) relates the following factors to the knowledge producer:

- *Lack of motivation* to share knowledge.
- *Lack of reliability*, credibility of the knowledge producer.
- The *incomplete understanding* of why the use of the knowledge could lead to an intended outcome.
- A *difficult relationship* between the producer and the recipient.

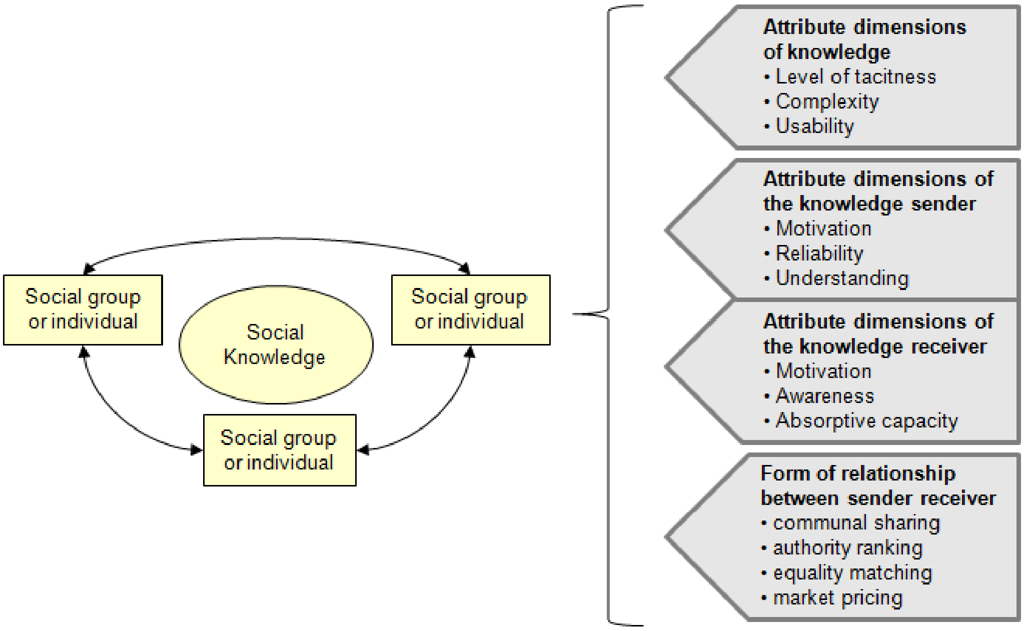
In addition to the influencing factors in motivation and relationship discussed earlier, Szulanski (2003) further argues that, when the knowledge producer is not perceived as reliable, i.e. not seen as trustworthy or knowledgeable, initiating a transfer from that source will be more difficult and it is likely to be challenged and resisted by the receivers. Alternatively, if the knowledge is not perceived to be useful or does not have a proven record of usefulness, it also will be difficult to motivate the knowledge producer to transfer (Szulanski, 2003). In this sense, the knowledge producer might feel uncertain and withhold knowledge because he or she is unsure of its accuracy.

Based on these considerations, one can conclude that the knowledge producer affects knowledge sharing through motivation, understanding, reliability and relationship.

As presented in this section, the knowledge producer is a critical element in successful knowledge sharing. Seiler (2004) points out that knowledge needs to be objectified and conventionalised before it can be communicated. Without this process, no exchange or understanding is possible. Therefore, tacit knowledge needs to be converted to an explicit format that is acceptable and usable by both the source and recipient. Depending on the content of the tacit knowledge, this might be difficult to achieve because formalisation increases the distance between the knowledge and its meaning (Seiler, 2004). A great deal therefore depends on the source translating the tacit knowledge to an appropriate and user-friendly format that allows knowledge sharing.

Cohen and Levinthal (1990) introduced the concept of *absorptive capacity* to explain how a person or a team is able to learn something from an external source. The ability to exploit external knowledge is mainly a function of the level of existing relevant knowledge. It includes the competence to recognise the value of new information, assimilate it and apply it to commercial ends (Cohen and Levinthal, 1990). In other words, the more the knowledge receiver knows, the better he or she is able to learn or adopt something new. This means that the recipient's education and experience, as well as existing knowledge, are influencing factors on knowledge sharing. The recipient should also possess a receptive disposition, as well as the necessary intellectual level (Schutte, 2007). The influencing factors discussed in the above sections are summarised in Figure 29.

Figure 29. Knowledge Producer and Receiver as Enabler/Barrier


Social group or individual
Social Knowledge
Social group or individual
Social group or individual
Attribute dimensions of knowledge
• Level of tacitness
• Complexity
• Usability
Attribute dimensions of the knowledge sender
• Motivation
• Reliability
• Understanding
Attribute dimensions of the knowledge receiver
• Motivation
• Awareness
• Absorptive capacity
Form of relationship between sender receiver
• communal sharing
• authority ranking
• equality matching
• market pricing

In conclusion, the individual factors (motivation, reliability, understanding, awareness and absorptive capacity) of the knowledge producer and recipient, as well as the interpersonal factors of the relationship, are factors that can influence knowledge sharing, both positively and negatively. However, the knowledge producer and recipient operate in a particular context that bounds the knowledge sharing.

4.5.4.3 Context as Enabler/Barriers

Some researchers argue that the context is formed by the organisational culture, organisational infrastructure and information technology (Schutte, 2007; Choo, 2008).

Culture is a pattern that determines the thinking, feelings, and behaviours of individuals (Hofstede et al., 1990). It is a broad term with different meanings, e.g. national, organisational and professional culture. Most people are influenced by different cultures; for example, during childhood by national culture, during education by functional culture, and during professional life by organisational culture. Consequently, cultures influence the behaviours of individuals in their daily lives. Culture is a complex and nested phenomenon (Swidler, 1986). Culture is important because it can significantly influence the attitudes and behaviours of individuals and, as a result, it directly affects the knowledge sharing process in organisations (De Long and Fahey, 2000; House et al., 2002). Xiong and Deng (2008) define two types of culture, which have a direct impact on knowledge sharing, namely national and organisational culture. National culture is the shared value, beliefs and norms, which shape people's behaviours on the basis of national origins (Chow et al., 2000; Michailova and Hutchings, 2006). It is often approached from a different perspective in order to improve understanding of the concept of national culture and its impact on individuals; for example, Hofstede et al. (1990) proposes a five-dimensional framework for describing national culture:

- Power distance.
- Individualism-collectivism.
- Uncertainty avoidance.
- Masculinity-femininity.
- Long-term orientation.

This framework is widely accepted and used for distinguishing national culture in research. Xiong and Deng (2008) further argue that, to understand and potentially improve knowledge sharing, a better understanding of the role of culture is crucial. However, in this research, the focus is on one company, in one country; therefore, the focus could be limited to a detailed discussion of the organisational culture. Organisational culture is the shared value and beliefs that shape the practice of people in the organisation and collectively guides how organisational members perceive, think about and react to its environment (McDermott and O'Dell, 2001; Smith and Argyris, 2001). Organisational culture is often referred to "as the way things are done" in an organisation (Park et al., 2004). The influence of organisational culture on knowledge sharing is often manifested in organisational norms that, in turn, influence individual employees' behaviour (Alavi et al., 2006; De Long and Fahey, 2000). McDermott and O'Dell (2001) emphasise the importance of integrating knowledge sharing into existing values in order to enhance and improve it. Developing a knowledge sharing culture in an organisation is an effective means for promoting knowledge sharing (Davenport and Prusak, 1998). Zakaria et al. (2004) demonstrate that technology, leadership, trust, communication and training are the critical factors for knowledge sharing. Similarly, Al-Alawi et al. (2007) argue that qualities positively related to knowledge sharing in organisations are trust (and openness), communication between staff (collaboration), rewards, organisational infrastructure, technological systems (IT and ICT). Xiong and Deng (2008) summarise that a knowledge-sharing culture consists of critical factors, which are usually distinguished by:

a) Organisational factors.
b) Managerial factors.
c) Technical factors.

These three factors are further discussed in the following sub-sections.

4.5.4.4 Organisational Factors

Xiong and Deng (2008) argue that organisational factors include the following:

Rewards and incentives: A reward system can also be a barrier to knowledge sharing. Many firms have cultures that do not support knowledge sharing. For example, when employees are accountable for their time and the reward system does not take into account the time spent on knowledge sharing, they do not give it time. Providing time and opportunities for people to share knowledge is important (Martensson, 2000) and organisations have to design their reward systems in such a way that they make time available to perform knowledge sharing (Soliman and Spooner, 2000). Special rewards and incentive methods can act as an extrinsic motivation that encourages employees to share knowledge. Such rewards signal the direct impact on the individual who contributes and gets the message that this is valuable and valued.

Bartol and Srivastava (2002) proposed a relationship of monetary reward systems to different types of knowledge sharing. They identified four mechanisms of knowledge sharing, which are individual contribution to databases, formal interactions within and between teams, knowledge sharing across work units and knowledge sharing through informal interactions. They further argue that monetary rewards encourage knowledge sharing in the first three mechanisms. Informal knowledge sharing requires more intangible incentives such as enhancing the expertise and recognition of individuals. Supporting this argument, McDermott and O'Dell (2001) suggested that tangible rewards alone are not sufficient to motivate knowledge sharing among individuals. Non-monetary incentives are needed to stimulate intrinsic motivation of individuals. Thus, despite the positive influence of rewards on knowledge sharing, Hendriks (1999) argues that the quantity of knowledge sharing may perhaps be motivated and enhanced by external rewards but the quality cannot. Furthermore, external rewards might be risky because they suppress intrinsic motivation, which is important for sharing tacit knowledge (Osterloh and Frey, 2000). In this context, Bock and Kim (2002) showed that external rewards are not very good at facilitating a knowledge sharing attitude because sharing is a social act motivated by social purposes and internal factors.

Roles and teams are another critical organisational factor for successful knowledge sharing (Davenport and Prusak, 1998; Soliman and Spooner, 2000). Roles as knowledge sharing enablers are embedded in the jobs descriptions of core functional areas in an organisation, e.g. positions and skills of knowledge managers. A further aspect of organisational roles that positively influences knowledge sharing is administrative actions and responsibilities, e.g. tutoring, mentoring and education. Such organisational roles should, for example, include the task of project debriefing at the end of a consultancy assignment. This helps consultants to learn systematically from experiences gained. In this sense, the lessons learned could be systematically analysed and stored for access through other employees. Furthermore, teams are enablers of knowledge sharing, e.g. the units that carry out the work in many knowledge-intensive organisations (Chong, 2006; Walczak, 2005). In this context, as already discussed, a popular approach to fostering knowledge sharing is to develop communities of practice within organisations.

Training and education are related factors to roles and teams. They can significantly influence knowledge-sharing and are often under-emphasised. Frequently, workers do not use knowledge-sharing technology and tools simply because they are not sure how they work or do not understand what behaviours they are expected to practice (Connelly, 2000).

Organisational structure is a further influencing factor. Organisations with a centralised, bureaucratic management style can stifle the creation of new knowledge, whereas a flexible, decentralised organisational structure encourages knowledge-sharing, particularly knowledge that is more tacit in nature (Chung, 2001). Hierarchical bureaucracy allows vertical knowledge transfer through typical chain-of-command but inhibits horizontal knowledge transfer that must cross the organisation's functional boundaries (Walczak, 2005). Many authors argue that hierarchical structures limit active knowledge sharing and that, in contrast, non-hierarchical, self-organising organisational structures improve knowledge sharing (Nonaka and Takeuchi, 1995; O'Dell and Grayson, 1998).

The *physical configuration* of the work environment, including layout of offices and spaces for staff to meet informally, is important to encourage exchange of ideas and sharing knowledge (Soliman and Spooner, 2000). The physical configuration, e.g. office layouts, can reduce the distance between workers or professionals and executives to foster *ad hoc*, informal and face-to-face communication. Structural characteristics, such as shared areas, open spaces and discussion rooms can help people to share knowledge because such physical characteristics can help to promote a culture of openness (Soliman and Spooner, 2000).

4.5.4.5 Managerial Factors

The managerial context of knowledge sharing includes the following:

a) *Trust* is one of the most important cultural aspects and the precondition for knowledge sharing within organisations is the trust among members of the organisation (Krogh, 1998). In organisations where people fear that knowledge might be misused, people are reluctant to share knowledge and, thus, without a high degree of mutual trust, people will be sceptical about the intentions and behaviours of others and withhold their knowledge (Chong and Choi, 2005).

Consequently, several researchers confirm that a culture of trust and confidence is required to encourage knowledge sharing organisations (Soliman and Spooner, 2000; Wong and Aspinwall, 2005). In this sense, an organisational culture of trust and respect between individuals and groups and having a trusting work environment helps to facilitate more proactive and open knowledge sharing (Yang and Wan, 2004).

b) *Leadership* is a further managerial factor. Leaders must act as catalysts in building team-oriented organisations (Nonaka and Takeuchi, 1995). Thus, knowledge sharing is based on consistent, reliable, plausible behaviour of management. Management must positively communicate that they are thoroughly convinced that knowledge needs to be nurtured, supported, enhanced, and cared for (Nonaka and Konno, 1998). Thus, management must act as exemplars of knowledge sharing and they have to give up knowledge hoarding first (McDermott and O'Dell, 2001).

c) *Openness*: This means that mistakes and past failure are openly shared and discussed without the fear of punishment (Davenport and Prusak, 1998) because it can be a key source for the creation of a learning organisation (Yang and Wan, 2004). Thus, individuals are encouraged to generate new ideas, knowledge and solutions to problems (Goh, 2003). As discussed earlier, another factor that may prohibit knowledge sharing is that employees may perceive accessing other's knowledge as a sign of inadequacy. Therefore, in a knowledge sharing, friendly culture, encouraged by executives (Davenport and Prusak, 1998), people do not fear that sharing knowledge could cost them their jobs, advantage or status (Hislop et al., 2000).

d) *Communication (collaboration)*: As previously concluded, the higher the level of tacitness then the more challenging knowledge transfer becomes and the higher the need for interaction between source and receiver. Davenport and Prusak (1998) argue that there is need for extensive personal contact in order to share tacit knowledge. Al-Alawi et al. (2007) refer to communication as an important cultural factor influencing knowledge sharing between people in organisations and communication refers to the face-to-face interaction. The term 'communication', as used by Al-Alawi et al. (2007), is defined by other researchers as collaboration. Goh (2003) asserts that a collaborative culture is an important condition for knowledge sharing to happen between individuals and groups. This is because knowledge transfer requires individuals to come together to interact, exchange ideas and share knowledge with one another. Thus, the better individuals communicate and collaborate with each other and with key outsiders, then the better the knowledge sharing (Cormican and O'Sullivan, 2003) because conversations are the way people discover what they know and become able to share it with their colleagues.

4.5.4.6 Technical Factors

A further relevant factor in knowledge sharing is technology, principally in the form of information and communication technologies (ICT) (Chong, 2006). ICT is one of the key enablers for knowledge sharing (Hung et al., 2005; Chong, 2006) and it facilitates knowledge sharing both within and outside an organisation's boundaries (Alavi et al., 2006).

a) *Technologies* support knowledge sharing by storing explicit knowledge and capturing tacit knowledge through the use of tools, such as expert systems. Many organisations are already performing knowledge sharing supported by information and communication technologies, e.g. large customer and product or service databases (Walczak, 2005).

b) Also many *software tools* are now available, such as content management systems (CMS), data/information visualisation tools; social software etc., which let people build communities and take part in virtual teams; brainstorm, develop, present and deliver knowledge; share documents or applications; discuss and manage projects; and coordinate activities (Zairi, 2006). However, the use of such tools differs widely between different organisations, depending on the firm's culture, experience and future vision (Chong, 2006).

Although technological infrastructure is clearly recognised as a relevant enabler for knowledge sharing, motivation and willingness to share knowledge are prerequisites for using information systems (Yahya and Goh, 2002). Zairi (2006) concludes that there is evidence that the use of such tools leads to enhanced communication and increased levels of participation among people in organisations by providing the right information, respectively knowledge, to the right people at the right time.

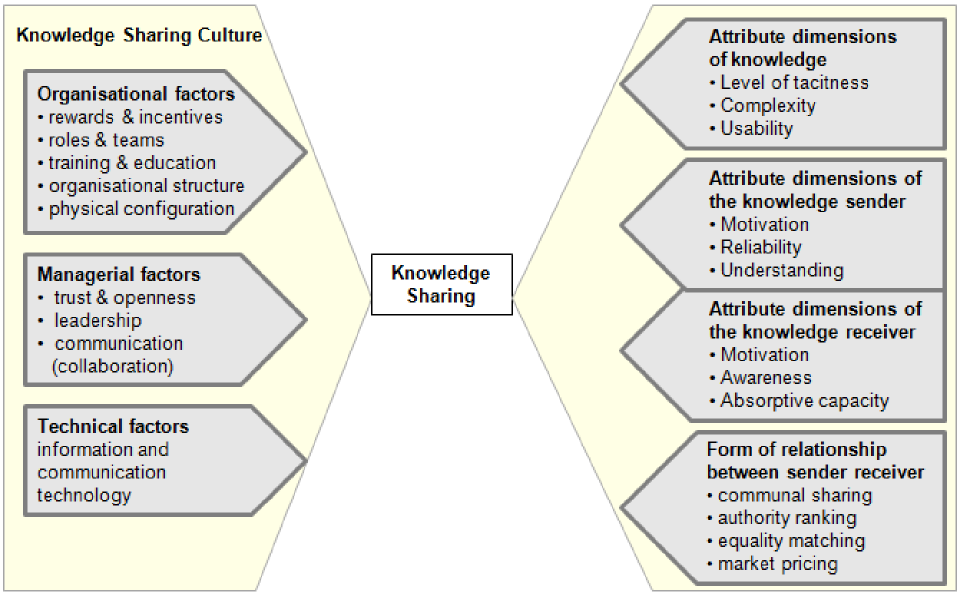
4.5.5 Summarising Knowledge Sharing Barriers and Enablers

One can distinguish between factors affecting knowledge sharing and factors affecting knowledge transfer specifically, as the transfer of knowledge between knowledge sender and knowledge receiver. Gouza (2006) and (Szulanski, 1996) define the main sets of influencing factors as the knowledge *per se*, the knowledge producer, the knowledge recipient and the context in which the knowledge sharing takes place (including the knowledge sharing culture). The latter is defined by Xiong and Deng (2008) as a more general factor affecting knowledge sharing and consisting of three sub-factors, which are organisational, managerial and technical factors. These factors were summarised in seven categories, each with its own sub-factors:

- *The attribute dimensions of knowledge per se*: including level of tacitness, complexity, and usability.
- *The attribute dimensions of the knowledge producer*: including motivation, reliability, and understanding.
- *The relationship between knowledge sender and receiver*, including four fundamental forms of human relationships, which are communal sharing, authority ranking, equality matching and market pricing.
- *The attribute dimensions of the knowledge recipient*: awareness, motivation, and capacity to absorb.
- *The organisational factors* (as an element of the knowledge sharing culture), including rewards and incentives, roles and teams, training and education, organisational structure and physical configuration.
- *The managerial factors* (as an element of the knowledge sharing culture), including trust and openness, leadership and communication (collaboration).
- *Technical factors* (as an element of the knowledge sharing culture), including information and communication technology.

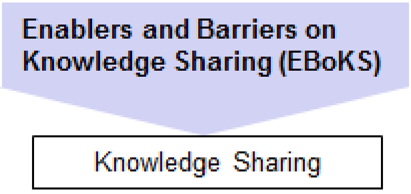
The enablers and barriers of knowledge sharing identified from literature can be summarised as shown in Figure 30.

Figure 30. Enablers and Barriers on Knowledge Sharing


Knowledge Sharing Culture
Organisational factors
• rewards & incentives
• roles & teams
• training & education
• organisational structure
• physical configuration
Managerial factors
• trust & openness
• leadership
• communication (collaboration)
Technical factors
information and communication technology
Knowledge Sharing
Attribute dimensions of knowledge
• Level of tacitness
• Complexity
• Usability
Attribute dimensions of the knowledge sender
• Motivation
• Reliability
• Understanding
Attribute dimensions of the knowledge receiver
• Motivation
• Awareness
• Absorptive capacity
Form of relationship between sender receiver
• communal sharing
• authority ranking
• equality matching
• market pricing

As visualised in Figure 30, one can distinguish the main two categories of enablers and barriers. On the one hand is the organisational culture, including organisational, managerial, and technical factors whilst, on the other hand, there are the factors influencing the knowledge transfer process (an element of knowledge sharing). These influencing factors on knowledge sharing need to be incorporated into the initial KBBPI framework being assembled. Figure 30 is further simplified (see Figure 31) to only display reasons in the KBBPI framework (Figure 32).

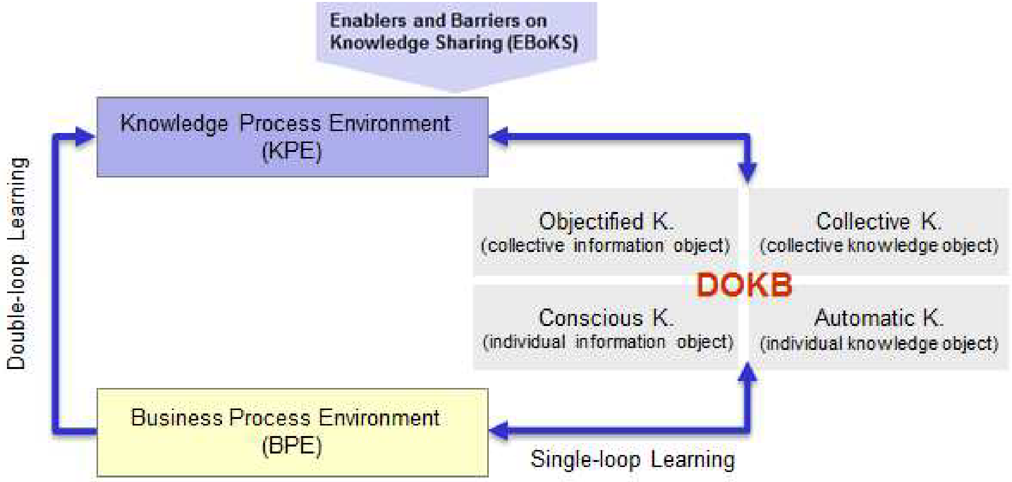
Figure 31. Simplified Model of Enablers and Barriers


Enablers and Barriers on Knowledge Sharing (EBoKS)
Knowledge Sharing

4.5.6 Second Step in Developing the KBBPI Framework

As discussed in the prior section, one can conclude that the enablers and barriers of knowledge sharing are of particular relevance to the question of how to improve the performance of KPs. This means that the first part of an answer can be given to the question “How can knowledge processes be improved?”; namely, that reducing the negative effects of knowledge sharing barriers and strengthening the positive effects of knowledge sharing enablers affects directly the performance of KPs. Based on this consideration, the knowledge sharing enablers and barriers identified are integrated into the KBBPI framework. This integration of the enablers and barriers on knowledge sharing (EBoKS) into the KBBPI framework is shown in Figure 32.

Figure 32. Second Step in Developing the KBBPI Framework


Enablers and Barriers on Knowledge Sharing (EBoKS)
Knowledge Process Environment (KPE)
Double-loop Learning
Objectified K. (collective information object)
Collective K. (collective knowledge object)
DOKB
Conscious K. (individual information object)
Automatic K. (individual knowledge object)
Business Process Environment (BPE)
Single-loop Learning

The function of this integration is that the EBoKS provide a guideline for analysing and improving the knowledge processes (through improving knowledge sharing in the KPs) in organisations. However, literature shows that there are more answers to the question of how to improve KPs.

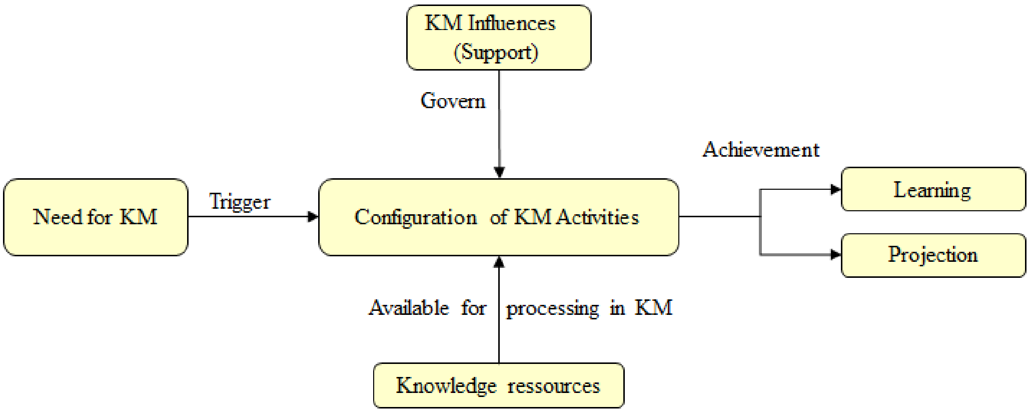
4.6 What are Managerial KM Processes?

As discussed earlier, KM in next generation knowledge management NGKM does not directly manage knowledge outcomes; it only impacts processes which, in turn, impact outcomes. Firestone and McElroy (2003) were mainly focused on elaborating a model for operational KPs and not for managerial activities of KPs; therefore, they fail to explain the meaning of their managerial activities in NGKM. They only refer to Mintzberg’s (1973) nine KM processes without going further into details. In contrast to this fuzzy description of knowledge management processes in NGKM, Holsapple and Singh (2005) developed the knowledge chain model aimed at understanding the impact of KM on business performance.

4.6.1 The Knowledge Chain Model

The knowledge chain model (KCM) is analogous to Porter's value chain model and it is intended to be a basic tool for diagnosing knowledge-based competitiveness and finding ways to enhance it. The starting point in this model is what Holsapple and Jones (2003) call a KM episode, which is a pattern of activities performed by multiple processors with the objective of meeting some knowledge need (Figure 33).

Figure 33. Architecture of a KM Episode


KM Influences (Support)
Govern
Achievement
Need for KM
Trigger
Configuration of KM Activities
Learning
Projection
Available for processing in KM
Knowledge ressources

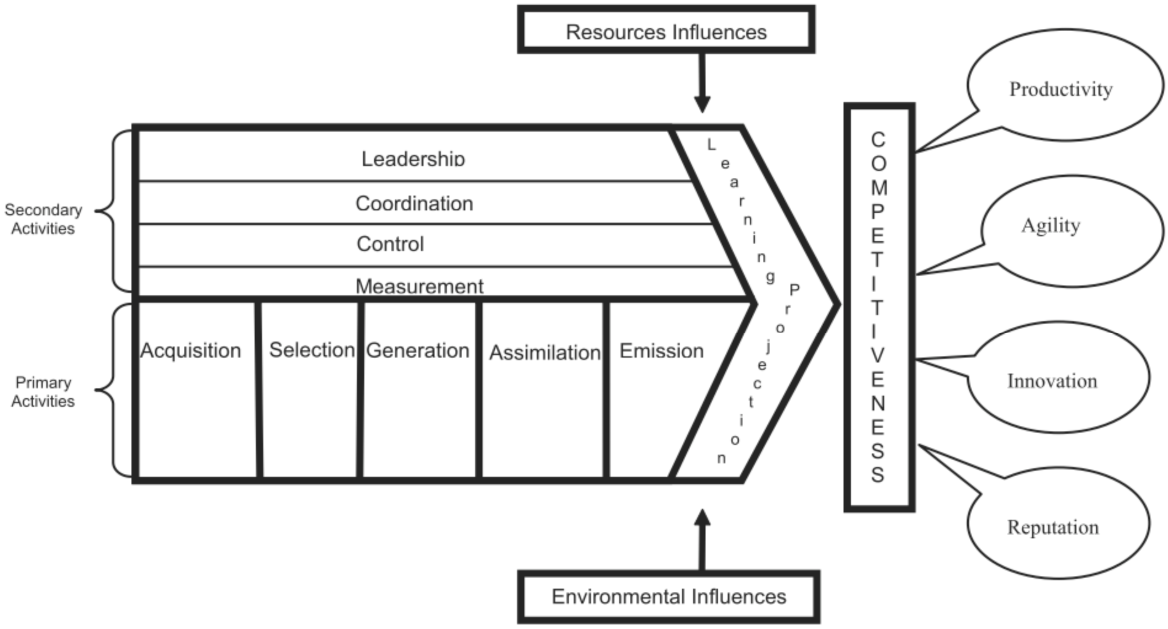
Source: Holsapple and Jones (2003).

Each episode begins with the recognition of a knowledge need and ends when either the need is satisfied or the effort is abandoned. In the course of a KM episode, some subset of an organisation's knowledge processors undertake various knowledge manipulation activities that operate on relevant knowledge resources in an effort to meet the knowledge need or seize a knowledge opportunity (Holsapple and Jones, 2003). They further argue that KM episodes may also be orchestrated, rather than occurring in a chaotic, unguided, or random fashion. Orchestration involves the execution of KM activities that influence the primary activities of the knowledge resources. Using these considerations, the knowledge chain model (Figure 34) was derived from a KM ontology, created by an international panel of over 30 KM practitioners and academics.

The central aspect in the KCM is that a KM episode consists of two main components:

1. Primary activities involving a skill in handling knowledge resources.
2. Secondary activities which support and guide the performance of primary activities.

Figure 34. Knowledge Chain Model


Resources Influences
Secondary Activities
Leadership
Coordination
Control
Measurement
Primary Activities
Acquisition
Selection
Generation
Assimilation
Emission
Learning Projection
COMPETITIVENESS
Productivity
Agility
Innovation
Reputation
Environmental Influences

Source: Holsapple and Jones (2003)

Following Figure 34, the primary activities performed by an organisation's knowledge processors in manipulating knowledge resources are:

a) *Knowledge acquisition*: acquiring knowledge from external sources and making it suitable for subsequent use.
b) *Knowledge selection*: selecting needed knowledge from internal sources and making it suitable for subsequent use.
c) *Knowledge generation*: producing knowledge by either discovery or derivation from existing knowledge.
d) *Knowledge assimilation*: altering the state of an organisation's knowledge resources by distributing and storing acquired, selected, or generated knowledge.

e) *Knowledge emission*: embedding knowledge into organisational outputs for release into the environment.

Since the managerial influences indicate meta-activities that impact or determine the deployment of resources and patterns of manipulation activities, they are included as secondary activities in the KCM.

f) *Knowledge leadership:* establishing conditions that enable and facilitate fruitful conduct of KM.
g) *Knowledge coordination:* managing dependencies among KM activities to ensure that proper processes and resources are brought to bear adequately at appropriate times.
h) *Knowledge control:* ensuring that needed knowledge processors and resources are available in sufficient quantity and quality, subject to security requirements.
i) *Knowledge measurement:* assessing values of knowledge resources, knowledge processors and their deployment.

As Figure 34 suggests, the knowledge chain model also recognises that an organisation’s resources and environment can impact learning and projections and therefore competitiveness.

Holsapple and Singh (2005) show that the primary and secondary activities lead to four organisational performance implications, which are productivity, agility, innovation, and reputation, referred to as PAIR approaches to competitiveness (Holsapple and Singh, 2005). Their argument is supported by other research:

- KM is increasingly seen as a potential contributor to productivity (Wiig and Jooste, 2004) and productivity can be seen as the value people contribute to business processes (Delio, 2000).

- Agility means the ability to react rapidly to demand and flexibility is becoming so critical in today’s environment that it is a leading competitive weapon (Fliedner and Vokurka, 1997).

- Knowledge can spur and drive innovation (Adams and Lamont, 2003; Amidon and Mahdjoubi, 1999). Nonaka and Takeuchi (1995) claimed their use of knowledge is the primary reason why Japanese companies can foster creativity and innovation for competitive advantage. In an Ernest & Young survey, executives saw innovation as the greatest payoff from KM, even though KM efforts so far had concentrated on achieving productivity gains (quoted in Holsapple and Singh, 2005).

- In knowledge-intensive businesses (KIBs), competitive advantage and profits are generated through the successful management of intangible assets such as reputation (Sveiby, 1997). For many organisations, favourable corporate reputation sets their organisation apart from the competition and motivates stakeholder decisions (Perrin, 2000).

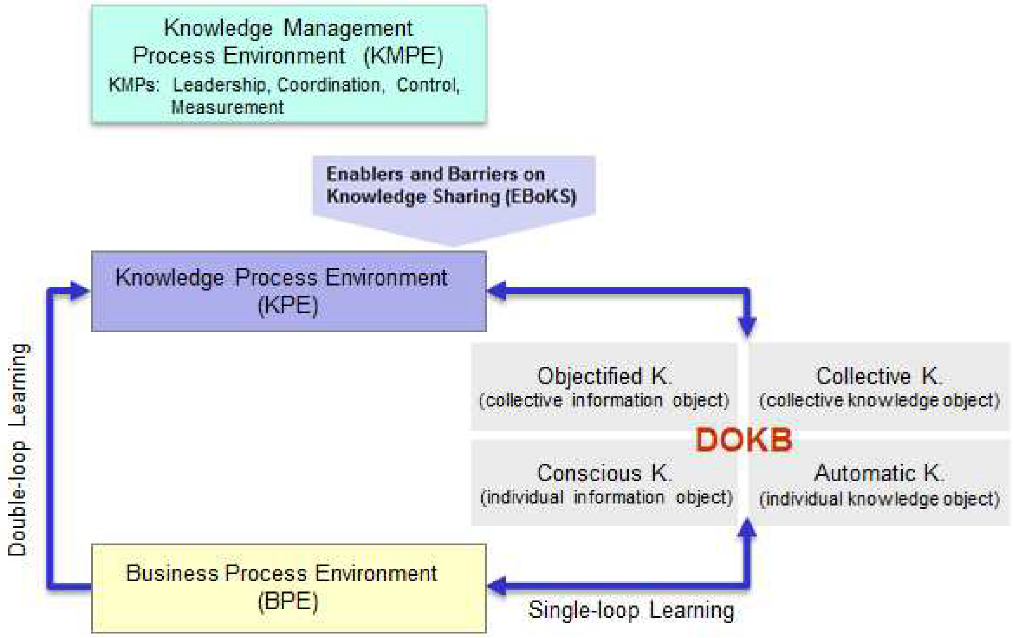
However, many factors influence the determination of organisational performance and attempts to trace causality to any single factor like KM may be risky. To avoid this risk, Holsapple and Jones (2007) confirmed in a study that the knowledge chain model and their KM activities can serve as sources of competitive advantage. This study from Holsapple and Jones (2007) offered empirical support for the propositions that there are activities in each of the nine knowledge chain classes discussed above, that can be performed in ways contributing to an organisation's competitiveness. At the heart of these considerations, as discussed earlier, is that KM has an impact on KPs and the performance of the BPs impacts the business results.

4.6.2 Third Step in Developing the KBBPI Framework

As discussed, both Firestone and McElroy (2003) and Holsapple and Jones (2003) developed a new understanding of KM in their models. A central notion in both models is the differentiation between knowledge processes (KPs) and knowledge management processes (KMPs). Firestone and McElroy (2003) do not define and explain KMPs in detail in their NGKM. In this regard, the knowledge chain model (KCM) from Holsapple and Jones (2003) is more specific in defining an understanding of managerial activities in KM because they distinguish more specifically the managerial activities from operational activities. Applying the terminology from Firestone and McElroy (2003), one can say that they build the knowledge management process environment (KMPE) (see Figure 35). The four activities (leadership, coordination, control and measurement) from Holsapple and Jones (2003) KCM are integrated as the KMPE into the KBBPI framework (see

Figure 35) and the consequences are discussed in the following sections.

Figure 35. Third Step in Developing the KBBPI Framework


Knowledge Management Process Environment (KMPE)
KMPs: Leadership, Coordination, Control, Measurement
Enablers and Barriers on Knowledge Sharing (EBoKS)
Knowledge Process Environment (KPE)
Objectified K. (collective information object)
Collective K. (collective knowledge object)
DOKB
Conscious K. (individual information object)
Automatic K. (individual knowledge object)
Double-loop Learning
Business Process Environment (BPE)
Single-loop Learning

The secondary activities from Holsapple and Jones's (2003) KCM can be interpreted as a representation of KM. In this interpretation, KM consists of these four activities. The integration of the KMPE into the KBBPI framework helps identify the four major forces (the secondary activities from the KCM) that influence the conduct of KPs and thus builds the basis for the discussion of how the KMPs, the KPs and the BPs relate to each other.

4.6.3 Fourth Step in Developing the KBBPI Framework

Comparing the principles of the KLC (see Figure 18) and the KCM (Figure 34):

- In Firestone and McElroy's (2004) KLC, a "problem" leads to "knowledge production", "knowledge integration" and "knowledge use". This means knowledge is created in response to organisational need, transferred or shared among organisational agents and then used in decision making.
- In Holsapple and Jones' (2003) KCM "KM episode" architecture, a "knowledge need" leads to "activities performed by multiple processors with the objective of meeting some knowledge need" leading to "learning" and "presentation" of "new

knowledge"

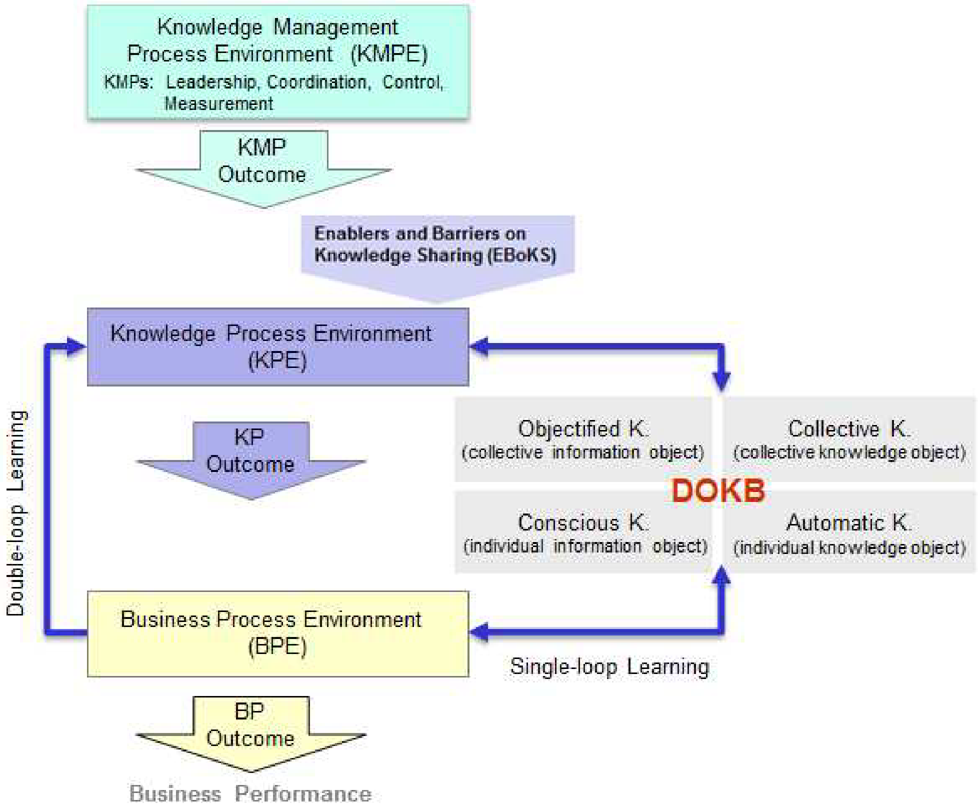
It can be reasonably concluded that both approaches have a corresponding underlying architecture based on Popper's (1999) schema of problem solving. Thus, one can conclude that the KLC from Firestone and McElroy (2003) corresponds in core principle with the notion of KM episodes from Holsapple and Jones (2003). A further indication of compatibility between the KLC and the KCM is the definition of the three tiers in Firestone and McElroy's (2003) KLC; namely, operational business processes (BP), knowledge processes (KP) and processes for managing knowledge processes (KMPs). One can compare these three tiers from the KLC with the central notions in Holsapple and Jones's (2003) KCM (see Table 13).

Table 13 Three-Tier Principle

Tier of KM	**Firestone and McElroy's (2004) Knowledge Life Cycle (KLC)**	**Holsapple and Jones's (2003) Knowledge Chain Model (KCM)**
1. Managerial	KM is management of the KLC, its immediate products, changes in organisational knowledge and changes in the DOKB.	The secondary activities in the knowledge chain model are meta-activities that impact or determine the deployment of resources and patterns of manipulation activities.
Impact of KM	KM affects knowledge processes and thus the quality of knowledge claims may improve.	KM impacts on the deployment of resources and patterns of manipulation activities.
2. Knowledge processes	In principle, the KLC includes knowledge production, knowledge integration knowledge use	The primary activities, that means knowledge manipulation activities with the general idea to handle knowledge resources.
Impact of knowledge processes	Improved knowledge claims (DOKB) may result in improvement in the quality of business process.	Impact on productivity, agility, innovation, and reputation.
3. Business processes	This implies that KM doesn't directly manage knowledge outcomes but only impacts knowledge processes, which in turn impact the outcomes of business processes.	
Impact on business results (competitiveness)	The critical link between KM and business results is through business processes.	PAIR approaches to competitiveness.

As Table 13 shows, a central notion in both models is the differentiation between knowledge processes (KPs) and managerial processes (KMPs). Furthermore, in both models, KM does not directly manage knowledge outcomes but impacts KPs which, in turn, impact the outcome of BPs. Thus, in both models, the critical link between KM, KMPs and business results is through a cascade of KPs and BPs. Holsapple and Jones' (2003) further argue that improved productivity directly relates to the higher performance of BPs and the other implications, at least indirectly, relate to the performance of BPs. However, a "core principle" in both models is that the KMPs affect KPs and the KPs affect the BPs. This "core principle" between KMPs, KPs, and BPs, is visualised in Figure 36 by the three arrows "KMP outcome", "KP outcome", and "BP outcome". "KMP outcome" indicates that KMPs affect KPs. "KP outcome" correspondingly indicates that the KPs improve the quality of knowledge used in BPs resulting in an improvement of BPs. Finally, "BP outcome" indicates that the improved BPs result in higher business performance.

Figure 36. Fourth Step in Developing the KBBPI Framework


Knowledge Management Process Environment (KMPE)
KMPs: Leadership, Coordination, Control, Measurement
KMP Outcome
Enablers and Barriers on Knowledge Sharing (EBoKS)
Knowledge Process Environment (KPE)
KP Outcome
Objectified K. (collective information object)
Collective K. (collective knowledge object)
DOKB
Conscious K. (individual information object)
Automatic K. (individual knowledge object)
Double-loop Learning
Business Process Environment (BPE)
Single-loop Learning
BP Outcome
Business Performance

The above Figure 36 integrates all elements derived from the published literature that correspond to the required functionality of a KBBPI framework (see Section 4.1). In the next step, the initial KBBPI framework is presented.

4.7 The Initial KBBPI Framework

A conceptual framework is described as a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation (Reichel and Ramey, 1987). Picket (2000) argues that a framework is a set of assumptions, concepts, values and practices that constitutes a way of viewing reality. When clearly articulated, a conceptual framework has potential usefulness as a tool and is a set of broad ideas and principles taken from relevant fields.

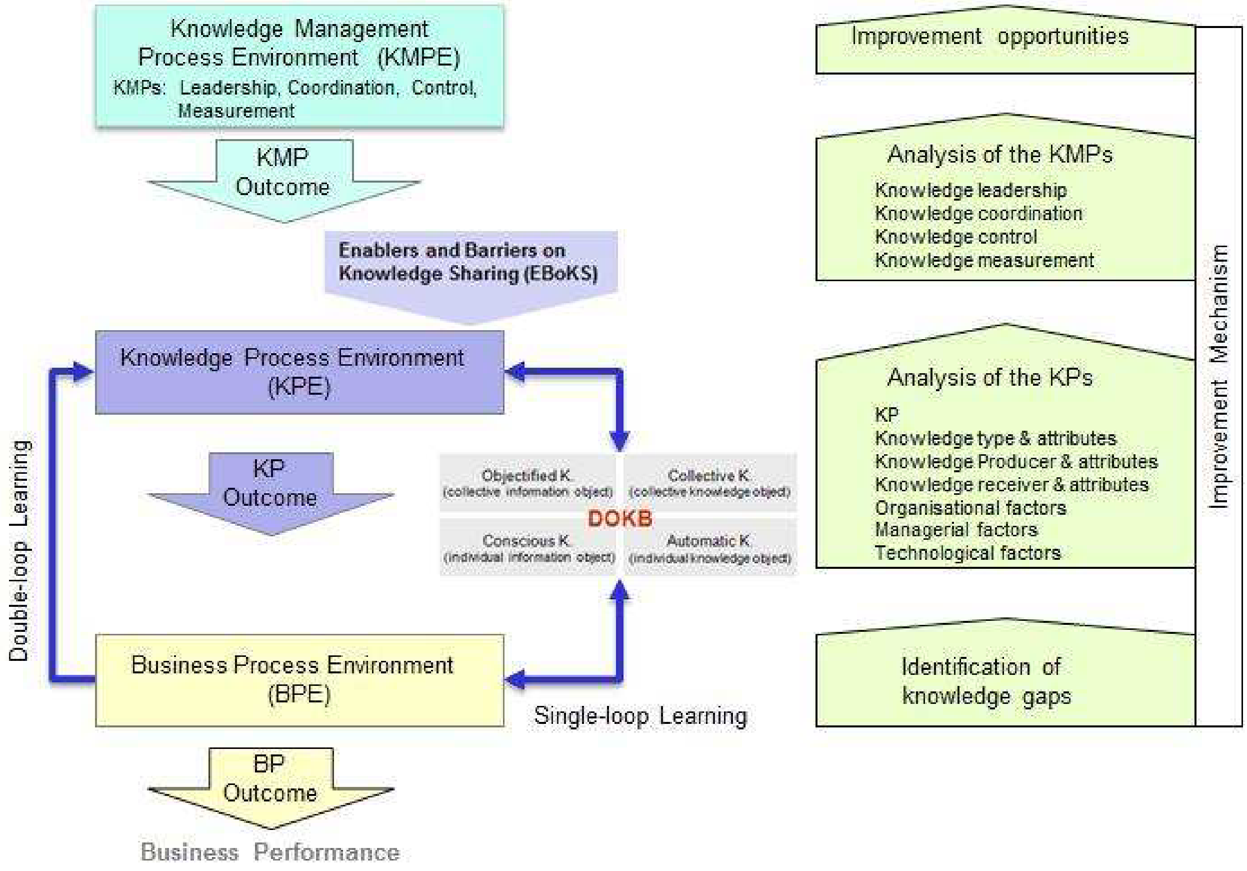
In that respect, a framework is a comprehensive construct that makes explicit the following two elements' fundamental assumptions and specification of the concept.

4.7.1 Fundamental Elements of the KBBPI Framework

Several threads of thought from two separated bodies of knowledge are used as cornerstones for the suggested KBBPI framework, new generation knowledge management (NGKM), as suggested by Firestone and McElroy (2003), and business process improvement (BPI).

The literature in these two fields provided a sound foundation for the KBBPI framework in the form of the fundamental elements shown in Figure 37.

Figure 37. The Initial KBBPI Framework


Knowledge Management Process Environment (KMPE)
KMPs: Leadership, Coordination, Control, Measurement
KMP Outcome
Enablers and Barriers on Knowledge Sharing (EBoKS)
Knowledge Process Environment (KPE)
KP Outcome
Objectified K. (collective information object)
Collective K. (collective knowledge object)
DOKB
Conscious K. (individual information object)
Automatic K. (individual knowledge object)
Business Process Environment (BPE)
BP Outcome
Business Performance
Double-loop Learning
Single-loop Learning
Improvement opportunities
Analysis of the KMPs
Knowledge leadership
Knowledge coordination
Knowledge control
Knowledge measurement
Analysis of the KPs
KP
Knowledge type & attributes
Knowledge Producer & attributes
Knowledge receiver & attributes
Organisational factors
Managerial factors
Technological factors
Identification of knowledge gaps
Improvement Mechanism

4.7.1.1 *The Core Elements (BPE, KPE, DOKB) of the Initial KBBPI Framework*

The starting point for the KBBPI Framework was Firestone and McElroy's (2004) KLC, including three core elements, the business process environment (BPE), the knowledge process environment (KPE) and the distributed organisational knowledge base. In both the KLC and the KBBPI framework, the central notion is that a problem experienced in a BP triggers the search for an acceptable solution and searching for a solution relates to the use and creation of knowledge. The KBBPI framework suggests that the relevant knowledge for the execution of the BPs is in the DOKB, which represents the organisational memory and incorporates any kind of organisational knowledge. The content of the DOKB is represented by the four different types of knowledge from Spender's (1996) knowledge taxonomy, namely:

- *Conscious knowledge*, which means individual explicit knowledge.
- *Objectified knowledge*, which means collective explicit knowledge.
- *Automatic knowledge*, which means individual tacit knowledge.
- *Collective knowledge*, which means collective tacit knowledge.

This representation of the DOKB through the knowledge types from Spender's taxonomy leads to more effective means for generating, sharing and managing knowledge. Spender's knowledge taxonomy is, in another sense, fundamental in the KBBPI framework because it allows for describing transfer of knowledge between individuals, from individuals to explicit sources, from individuals to groups, between groups and across groups.

4.7.7.2 Enablers and Barriers in the Initial KBBPI Framework

The function of KPE in the KBBPI Framework is bringing the right knowledge (including the generation of new knowledge) at the right time and in the right form to where it is needed. KPs include knowledge sharing as an inherent element and thus the KPs are affected by the enablers and barriers of knowledge sharing (EBoKS in Figure 37). The KBBPI framework distinguishes seven categories of enablers and barriers, each with its own sub-factors:

1. *The attribute dimensions of knowledge per se*: including level of tacitness, complexity and usability (see Section 4.5.4.1).
2. *The attribute dimensions of the knowledge producer*: including motivation, reliability and understanding (see Section 4.5.4.2).
3. *The attribute dimensions of the knowledge recipient*: awareness, motivation and capacity to absorb (see Section 4.5.4.2).
4. *The relationship between knowledge sender and receiver:* includes four fundamental forms of human relationships, which are communal sharing, authority ranking, equality matching and market pricing (4.5.4.3).
5. *The organisational factors* (as an element of the knowledge sharing culture), which include rewards and incentives, roles and teams, training and education, organisational structure and physical configuration (4.5.4.5).
6. *The managerial factors* (as an element of the knowledge sharing culture), which includes trust and openness, leadership and communication

(collaboration) (4.5.4.6).

7. *Technical factors* (as an element of the knowledge sharing culture), which includes information and communication technology (4.5.4.7).

These enablers and barriers of knowledge sharing are prominent in relevance to the question of how to improve the performance of KPs. This means that reducing the negative effects of knowledge sharing barriers and strengthening the positive effects of knowledge sharing enablers directly affects the performance of KPs.

4.7.7.3 The Knowledge Management Process Environment (KMPE) in the Initial KBBPI Framework

In the KBBPI Framework, the four secondary activities from Holsapple and Jones' (2003) knowledge chain model builds the knowledge management process environment (KMPE) composed from the four activities of leadership, coordination, control and measurement. These fours activities help to identify and to define KM in the second generation understanding.

4.7.7.4 The "Core Principle" in the Initial KBBPI Framework

The "core principle" of KMPs, KPs, and BPs is visualised by the three arrows "KMP Outcome", "KP Outcome", and "BP Outcome" in Figure 37. This mechanism suggests that KMPs affect KPs and thus the quality of knowledge may improve and may result in improved quality of BPs.

4.7.7.5 The Improvement Mechanism in the Initial KBBPI Framework

The improvement mechanism in the KBBPI framework (see Figure 37) is now the inversion of the core principle. The improvement mechanism suggests that improvement of KMPs pull up the outcome of the KPs and thus improves BPs and, finally, the business results. Therefore, the framework must be able to identify and to analyse all of the required entities, their relations and related rules on all three levels, the BPs, the KPs and the KMPs.

The improvement mechanism includes the following steps:

- *Identification* of knowledge gaps in the BPs.
- *Analysis* of the KPs in relation to a knowledge gap.

- *Analysis* of the barriers and enablers in relation to the KP, including the analysis on the sub category level.
- *Analysis* of the KMPs.
- *Formulation* of improvement opportunities.

4.7.8 Summary

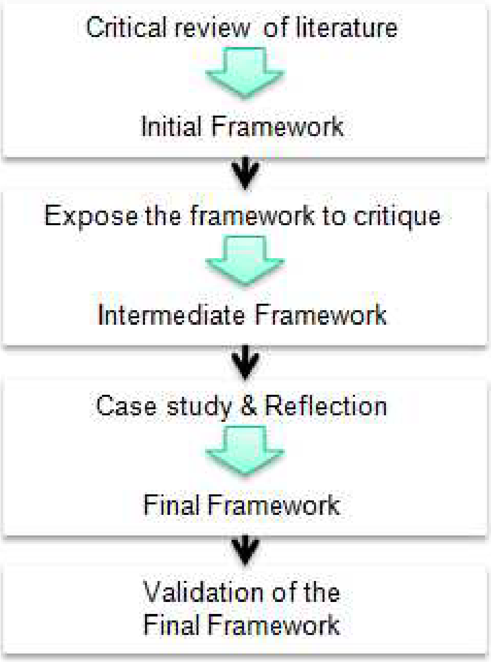
This chapter explained the development of the initial KBBPI framework, a tentative solution to the research problem derived from literature. The KBBPI framework is a comprehensive construct that makes explicit the two elements of fundamental assumptions and specification of the concept.

The three main elements of Firestone and McElroy's (2004) KLC, BP, KPE, and DOKB, as presented in Figure 37, are cornerstones of the KBBPI framework. Further elements were added to the framework from wider literature. The KBBPI framework distinguishes seven categories of enablers and barriers on knowledge sharing, represented by the EBoKS in Figure 37; each with its own sub-factors. In the KBBPI framework, four secondary activities from Holsapple and Jones' (2003) knowledge chain model (KCM) are incorporated, which builds the knowledge management process environment (KMPE) in Figure 37, composed from those four activities. The improvement methodology in the KBBPI framework is the inversion of the core principle represented by the three arrows "KMP outcome", KP outcome", and "BP outcome" in Figure 37, suggesting that improvement of BPs could be achieved through the identification of knowledge gaps in the BPs, analysis of the KPs in relation to knowledge gaps, analysis of the barriers and enablers in relation to the KPs, analysis of the KMPs and, finally, formulation of improvement opportunities.

Chapter 5

The Intermediate KBBPI Framework

This chapter moves to the second stage of the Methodology summarised in Figure 14 of Chapter 3 (repeated here):


Critical review of literature
Initial Framework
Expose the framework to critique
Intermediate Framework
Case study & Reflection
Final Framework
Validation of the
Final Framework

This research phase exposes the initial KBBPI framework to critique through feedback from practitioners and researchers regarding "How the tentative solution (the initial KBBPI framework) is perceived by experts" and "How the initial KBBPI framework can be improved". The product will be a testable intermediate KBBPI framework. Following the research methodology discussed in Chapter 3, this stage includes the following phases:

a) Data collection and analysis using interviews.
b) Validation of findings in a focus group session.
c) Data analysis and reflection of results.
d) Improvement of the framework and formulation of an intermediate version.

5.1 Data Collection in Redesigning

During the time of this research, the researcher was working for two organisations in different functions. At the start, the researcher was a full-time consultant working for a small management consultancy but, from 2001, the researcher started to work as a part-time lecturer for the University of Applied Sciences in Chur, Switzerland. Initially, the proportion of time working for the consultancy was about 90%, and 10% for the university. However, the proportion changed over time and, from 2004, the researcher has worked 90% for the university and 10% for the consultancy. Due to the researcher's dual profession, access to experts from academia as well as from practice was available. This provided excellent access to relevant experts and senior professional staff from both of the above organisations.

With purposive sampling, the sample is hand-picked for the research and, as the researcher already knew a lot about the potential participants, a careful and deliberate selection of participants with relevant experience could be made. The participants were selected based on their experience in the fields of BPI, KM and research; therefore, they were likely to produce the most insightful criticism and valuable data. Each was contacted to find out whether or not they were willing to participate in individual interviews and a focus group. A short profile of the participants is given in Table 14.

Table 14 Participants' Profiles in Redesigning

Initials/Function	Short Profile
RK/Managing Partner	Practitioner, senior manager, over 20 years of experience in consulting. Specific experience: process management.
DC/Partner	Practitioner, senior manager, over 10 years of experience in consulting. Specific experience: process re-engineering and organisational change.
FI/Partner	Practitioner, senior manager, over 15 years of experience in consulting. Specific experience: process re-engineering and organisational change.
MM/Lecturer	Academic, Senior Lecturer: Organisation and Human Resource Management, experienced with KM.
MP/Lecturer	Academic, Senior Lecturer: Economics and Research

In total, five individuals agreed to participate in this redesign phase, resulting in three participants being selected from the Management Consultancy and two from the University of Applied Sciences. With each person in Table 14, one individual interview was conducted and all interviewees participated in the focus group session.

As the researcher was an insider in both organisations, no specific actions were required to get access to the organisations or to understand a specific organisational culture. The researcher prepared an interview guide in the form of a printed PowerPoint presentation (Appendix A), which was based on the initial KBBPI framework proposed, to provide structure to the interview. Furthermore, the researcher prepared handwritten notes consisting of background information about the researcher and the research and two “bottom-line” questions to be asked at the end of the presentation. These posed the questions, “How do you perceive the initial KBBPI framework?” and “How could the initial KBBPI framework be improved?”

The potential interviewees were contacted by email, phone and in person in order to provide preliminary background information about the research, to inform them about the aim of the interview and to explain the next step, which was the focus group session. This meant the interviewees were fully informed in advance. Finally, the researcher reserved rooms for the interviews where necessary.

The interviews were held at the organisations themselves in order to minimise the travel effort of the interviewees. A short discussion about recording the interviews showed that the interviewees did not feel comfortable with recording, although they did not mention specific reasons. Accordingly, it was necessary to take detailed notes during the interview. These were expanded on and clarified immediately after the interview in order to minimise errors/losses through memory.

The interviews started with a short introduction about the aim of the interview, followed by presentation of the initial KBBPI framework and then asking the two open-ended questions, “How do you perceive the initial KBBPI framework?” and “How could the initial KBBPI framework be improved?”

Except for the two questions, the interviews were unstructured and the researcher followed interviewees’ narration and generated further questions spontaneously, based on the reflection of it.

The presentation provided structure to the interview progression and, to the researcher's surprise; the interviewees generally asked no questions during the presentation. After the researcher asked the two questions at the end of the presentation, the dialogue with the interviewees started. Initially, questions from the interviewees were aimed at clarifying several specific topics; for example, definitions of terms, before moving to a discussion in which comments on the initial framework were made.

Once the discussion finished, the interviewer read back the notes taken and asked if any points required clarification before the interview came to a close. The interviews lasted an average of just under one hour, which included time spent explaining the KBBPI framework.

Following each interview, the researcher reflected on what had happened and what was learned. Furthermore, in addition to the transcripts, the researcher made notes based on observations, including the participants' behaviour and any contextual aspects. This was done as soon as possible after each interview. The researcher sent a copy of the interview transcripts to the interviewees a few days later and asked for their validation.

At the end of the interviews, the researcher had five transcripts from the individual interviews, an example of which is given in Appendix B.

The data analysis started with the text from the individual interviews being broken down into segments, numbered to link to the slides and questions used in the presentation.

When analysis progressed, the focus was put on the individuals' questions with the result summarised in an Excel spreadsheet, see Appendix C. This was followed by identifying and summarising themes, patterns and connections (Appendix D). Finally, the themes, patterns and connections were summarised into categories, both within and between the elements identified, including an assessment of the relative importance of different themes. These categories and their relative importance are presented in Table 15:

Table 15 Findings from Interviews in Redesign

Confirmations	Implementation Problems	Conceptual Problems
• The practice problem is assessed to be relevant for KIBS • Potentially successful approach for improvement of BPs (good idea) • Principle is understandable • The three-tier framework is convincing • The distinction of knowledge types seems to be useful • The influencing factors affecting KPs are assessed to be relevant	• Major concern was the cost-benefit ratio • Complexity of the approach • Need for explanation, especially the definitions • Required effort to explain the functionality of the framework • Missing confirmations and experience from practice	• Missing implementation methodology • Missing integration with common KM approaches, specifically KM strategy

The final step of data analysis at this stage was the interpretation of these findings. The results presented in Table 15 were interpreted by the researcher as follows:

a) The initial version of the KBBPI framework is assessed as a good idea. No contradictions in the concept were identified by the participants. Especially important is the confirmation that the main elements of the framework (namely the principle of the three-tier framework and the influencing factors), were assessed as convincing.

b) The major concern of the participants was the practicality of the framework in practice. The participants expressed concern at the cost-benefit ratio, the complexity and the implementation effort; however, these problems do not relate directly to the KBBPI framework itself but to its implementation.

c) The participants argued that the implementation methodology for the framework was missing and that the connection of this approach with a known approach, such as familiar KM strategies, was not visible.

The results from the interviews were presented in a focus group session (discussed in the next section), which facilitated not only the further exploration of the framework and interview outcomes but also data triangulation. This increased the validity of the findings.

The focus group facilitated feedback on what the participants thought about the results from the interviews, with further reflection on the KBBPI framework and views on how to improve the framework. Sampling was no issue at this stage because all five participants from interviews agreed to participate in the focus group session.

The topic guide (Appendix D) included a short list of questions derived from the findings from the prior interview (see Table 15) and served as an agenda for the focus group. This included validation of the findings from the interviews and confirmation of the completeness of findings in relation to the interview questions.

Additional material was prepared for cross-questioning, including “Why do you believe that it is important?” and “Do you have any confirmation of your argument?”

The participants were contacted by email, phone and in person in order to agree a date and location for the focus group session. They received the topic guide and the summary of results from the interviews in advance. The participants were fully informed about the aim of the focus group and the researcher reserved a room at the university in Chur for the meeting.

As with the interviews, the focus group started with a short introduction by the researcher about the aim and purpose of the meeting. The discussion followed the agenda, as described above. During the discussion, all participants were given the opportunity to participate and the researcher (as facilitator) used a variety of moderating tactics; for example, providing the context information, to lead the group. The researcher stimulated the participants to talk to each other rather than to him and, as no shy or dominant individuals participated, the need to use moderating tactics was very limited.

The focus group lasted about two hours. At the beginning, some participants were very sceptical that it would be possible to find an organisation for implementation and, as a consequence, they were not enthusiastic. However, after discussion of the first two issues, the general tendency was that they became more involved. Once the focus group session finished, the researcher read his notes back and asked if any points required clarification.

During the focus group, the researcher noted that the discussion generally tended to move into a discussion about implementing the framework and the question of whether it would be possible to find an organisation willing to implement it. One focus group participant stated: "*It might be impossible to find an organisation for implementation without clearly explaining the benefits.*" Another expressed the concern (agreed by others) that: "*The major problem will be to find an organisation willing to implement the framework. Due to the high complexity, unclear cost-benefit ratio and lack of references, it will be extremely difficult to find an organisation willing to implement the framework.*" One participant, a practitioner, added after this statement that: "*This will be impossible!*"

Other concerns of the participants were that there was no implementation methodology and that it was unclear how the BPs for an implementation could be identified. One participant asked *"Are there any criteria available, which would support the identification of BPs?"*

The researcher wrote one transcript from the focus group. The data analysis was limited to categorisation and interpretation of findings (Appendix E), which were sent to the participants for verification. The resultant categories and their relative importance are presented in Table 16:

Table 16 Findings from Redesigning

Confirmations	Implementation Problems	Conceptual Problems
• **The practice problem** is assessed by own experience of participants to be generally relevant • **Potentially successful approach** for improvement of BPs (good idea) • **The three-tier framework,** as a principle, is convincing • **The attributes**, the distinction of knowledge types and influences seems to be useful	• **Difficulty to find an organisation** willing to implement due to: - high complexity - unclear cost-benefit ratio - no references confirming the benefits	• **Missing implementation methodology** • **Missing integration with common KM approaches,** specifically KM strategy

The results presented in Table 16 are interpreted by the researcher and detailed in the following paragraphs.

The focus group session confirmed that the initial version of the KBBPI framework was a good and credible idea and no contradictions in the concept were identified. Thus, it was concluded that the framework formed a potential approach for improvement of BPs, despite the fact that there is no proof of the potential benefit at this point. The researcher concluded that the benefit problem was real and needed to be addressed as the research progressed. However, this was an early stage and it was only an initial framework.

The researcher also concluded that the identification of one or more appropriate BPs for improvement in an organisation must be an inherent part of the implementation methodology. Based on the results, an implementation methodology is definitely required in order to make the framework more operational and implementable.

In this step, the researcher encountered several opinions and concerns regarding the initial KBBPI framework and this feedback helped in formulating improvements to it.

5.2 Discussion of Findings from Redesigning

The objective of this redesigning stage was to move the initial framework developed from the literature base to a better solution that could be implemented subsequently and evaluated in a case study. The discussion in Section (5.1) identified the problems from the discussion with the experts (see Table 16), which are discussed in detail below.

5.2.1 The (Practice) Problem

The practice problem (starting point for this research) is the lack of a model in the organisation that would help to guide KM initiatives. Based on the feedback from the focus group session with highly educated and very experienced people, the formulated research problem was accepted as valid and worth investigating. This finding was assessed by the researcher as not relevant for methodological or conceptual considerations.

5.2.2 Potentially Successful Approach for Improvement of BPs

The participants confirmed the result from the interviews that the initial version of the KBBPI framework is a good idea and no obvious contradictions were identified. Furthermore, they confirmed the main elements of the framework and its improvement principle. This assessment of the initial KBBPI framework as a prototype seems to be unproblematic because nobody mentioned that this assessment would hinder the KBBPI framework from being implemented. These finding were assessed by the researcher as not relevant for methodological or conceptual considerations.

5.2.3 Difficulty of Finding an Organisation

The difficulty of finding an organisation potentially willing to implement was assessed as being caused by the high complexity, the unclear cost-benefit ratio and missing references.

5.2.3.1 High Complexity of the KBBPI Framework

Given the fact that the KBBPI framework was perceived to be highly complex, the researcher considered reducing the complexity and further developing the framework. Nevertheless, the researcher argues that the question of complexity does not relate to the concept or methodology of the KBBPI framework, as long as no redundant elements are identified.

5.2.3.2 Cost-Benefit Ratio and No References

The major concern was whether the cost-benefit ratio of the KBBPI framework would be acceptable. The researcher argues that the unknown cost-benefit-ratio and missing references represent the same issue; namely, lack of evidence. Encouragingly, this is not a structural question; it is helpful to consider here a parallel with knowledge management (KM) itself. Many organisations, especially SMEs, still have deliberately not approached KM activity because they cannot evaluate the benefits from it. Such barriers, which hinder organisations implementing KM, have been identified from various authors who have researched and written directly on this issue. Although SMEs may be aware of the power of KM and the importance of knowledge in their organisation, they often feel that they have other more pressing priorities and needs. The researcher argues that it is a fact that the cost-befit-ratio is unknown but there is no other solution to this problem than to prove it. Thus the researcher concludes that this question also has no structural implication for the KBBPI framework.

5.2.3.3 Missing Implementation Methodology

A methodology is required in order to make the framework more operational and implementable. The implementation steps in the KBBPI framework so far suggested were assessed as incomplete and not clearly declared as implementation methodology. Thus, a more specific and detailed implementation methodology should be incorporated into the KBBPI framework.

5.2.3.4 Missing Integration with Common KM Approaches

Building a KM solution based on a business process-oriented methodology requires a transition from the traditional whole-company approach to an approach focusing on a knowledge-intensive business process, chosen because it of core importance to a company (Baloh et al., 2008). Maier and Remus (2001) identified scenarios for KM implementation and one of these scenarios is the "knowledge management starter". Most organisations with a KM initiative can be quite homogeneously characterised as being a KM starter (Maier, 2002). Maier and Remus (2001) distinguish two typical situations for the implementation of BPOKM concepts:

- Process management initiatives are initiated by an organisational unit or project responsible for process management and they expand their perspective towards KM.
- The other situation is a KM project with a strong focus on (knowledge-intensive) business processes. One typical starting point would be the implementation of KM to support one or more business processes. In this view, KM instruments would be designed and implemented as knowledge processes or lead to a redesign of knowledge-intensive business processes.

Based on these considerations, one can conclude that the KBBPI framework does not follow the traditional whole-company approach but, in contrast, focuses on a knowledge-intensive business process, which is of core importance for a company.

In order to summarise so far, the main finding is the missing implementation methodology for the KBBPI framework. In the following section, the consequences are discussed.

5.3 Formulation of the Intermediate KBBPI Framework

The results from the first evaluation of this initial KBBPI framework are now considered in the light of a focussed literature review with the goal of leading to an intermediate version. Consideration of the given results identified only one structural consequence, which was the missing implementation methodology for the KBBPI framework.

5.3.1 Integration of a Implementation Methodology

The objective of any BPI methodology is to identify and implement improvement to the process (Zairi and Sinclair, 1995). Today's BPI methodologies have their origins in the earlier discipline of organisation and methods (Povey, 1998). Today, there are many methodologies available under the general heading of BPI. One reason for this variety is identified by Povey (1998), who observes that the term is being used to cover three distinctly different approaches to change, which are process improvement, continuous improvement approach and process redesign. These approaches were discussed in Section 2.3.5.

As discussed in section 2.3.6, a BPI framework typically consists of a concept to document and understand the existing BPs and a concept to identify opportunities for improvement. For example, Nil et al. (2003) argue that a BPI methodology can be divided into five logically organised phases:

1. *Researching* current processes and documenting the improvement opportunities.
2. *Selling*: if the research phase uncovers enough improvement opportunities to make it worthwhile to go ahead with the BPI project, this phase focuses on creating a sales pitch to achieve management buy-in and then to sell the project to the rest of the organisation (Rasmussen et al., 2003).
3. *Planning*: creating a detailed project plan that describes each activity in the project, including the people involved.
4. *Designing* and *documenting* the new BPs.
5. *Implementing* the new and improved processes, measuring and recording improvements, and making necessary adjustments.

A comprehensive study conducted by Povey (1998) compared 10 BPI methodologies which he argued were a representative selection from relevant literature. Povey further argues that only three of the methodologies attempt to address the issue of implementation and all of them overlook the fact that processes are operated by people and are, therefore, “human activity systems”. Povey further argues that he has developed and successfully tested a BPI methodology that considers “human activity systems” and consists of the nine steps or activities presented in Table 17:

Table 17 Povey's BPI Methodology

Activities
1. **Get the CEO to be personally involved**. The amount of change and risk dictates not only that the CEO is personally leading the effort but also how much of his time is taken up with it.
2. **Analyse the organisation's top BPs**. Each process needs to be assessed, to decide which of them can be improved. The selection can be on the basis of the perception of their importance and performance, or an assessment of their business value compared to performance.
3. **Train staff in BPI and establish a project plan**. Each process should be owned by a manager and they must select their team, train them in the tools and techniques of process improvement and then actively lead them through the entire project
4. **Develop a root definition of the process to be redesigned**. To establish the purpose or objective and to gain understanding of the views of involved people.
5. **Map and analyse the "as is" processes**. Mapping the "as is" process is performed in order to gain a clear understanding of how and why the process operates the way it does.
6. **Develop the "to be" model of the improved process**. This is where the creative design work takes place.
7. **Compare the "as is" and "to be" processes** and identify all the changes that need to be made. Detailed implementation plans are needed to be developed.
8. **Test that required change is both feasible and desirable.**
9. **Develop action plans**. The testing done at the previous stage provides good input on the problems that can be anticipated during the implementation phase.

Source: Povey (1998)

The reason for choosing this methodology is that the KBPPI framework concerns human activity systems; the interaction of people is pivotal.

5.3.2 The Improvement Methodology in the KBBPI Framework

Based on the considerations in section (5.3.1), Povey's implementation methodology is adopted and summarised in Table 18.

Povey's (1998) implementation methodology is adopted without any fundamental change because there is no empirical data available and what requirements there are on the implementation methodology of the KBBPI framework. Comparing the few available concepts in the field of business process-oriented knowledge management (BPOKM) confirms the same phases as in Povey's (1998) implementation methodology. For example, Gronau (2005) suggests an implementation methodology consisting of identifying BPs; capturing BPs; modelling; analysing and recommendations (concept).

Based on these considerations, the implementation for the KBBPI framework is presented and commented in Table 18.

Table 18 The Improvement Methodology in the KBBPI Framework

What Needs to be Done	How Each Step is Performed	Expected Result
1. Get top management (CEO) support	Discussion (workshop) with senior executive and optionally with his management team.	Active commitment from top management is achieved
2. Pre-analyse organisation's top BPs	BPs needs to be assessed, to decide which of them can be improved. The selection can be on the basis of the perception of their importance and performance, or an assessment of their business value compared to performance. Investigate BP documentation and ask people about: • the outputs • the importance • the performance	Selected BPs for improvement
3. Establish a project plan	Develop together with the management, a rough plan, including timeframe, involved key people, rules and costs. Furthermore, process improvement teams must be established and a first task is to develop together a project plan	Project Plan
4. Develop a root definition of the BPs to be redesigned	Interview people and identify: The actors, the people who operate the process; the transformation the process performs and the "world view" of involved people.	A root definition of the process to be redesigned
5. Audit BPs, KPs, and KMPs	By interviewing the identified relevant people, the BP, KPs, and KMPs are mapped.	Process map including BP, KP, and KMP levels
6. Identify improvement opportunities	Analyse the results from mapping by looking for problems on all three levels in order to uncover improvement opportunities (weaknesses). Furthermore, the identified improvement opportunities are validated (confirmation from involved people).	Overview of weaknesses on BP, KP, and KMP levels
7. Formulate recommendations	Interview people in order to identify options for improvement. Meetings are held with all affected	Overview of recommendations

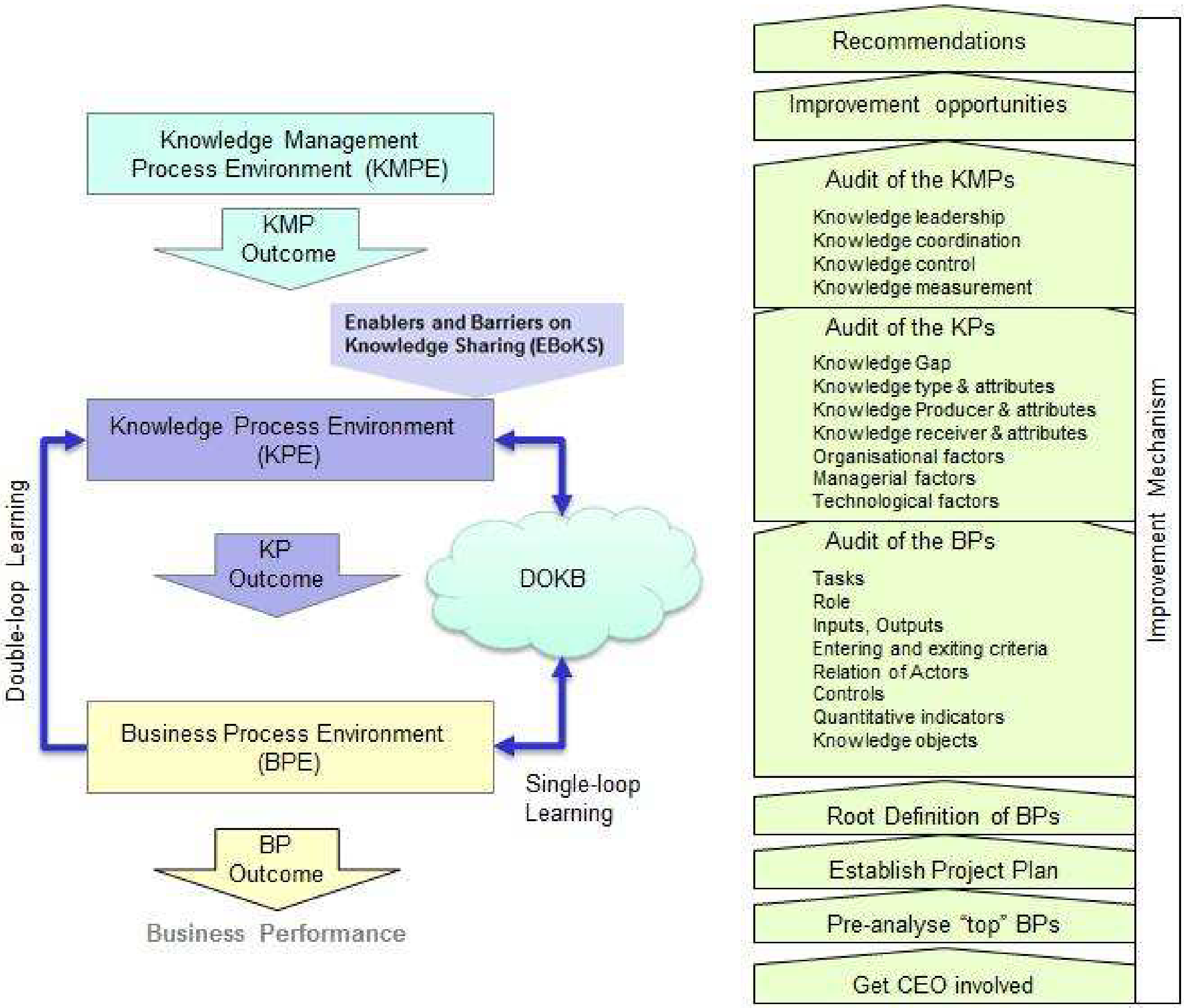
	parties to explain the proposed changes and to obtain feedback in order to finalise the changes. An initial test of the proposed changes to show they are both feasible and desirable.	(actions) for improvement on BP, KP, and KMP levels

This implementation methodology is included in Figure 38 showing the KBBPI framework and represents the next version, the intermediate KBBPI framework.

5.3.3 Visualisation of the Intermediate KBBPI framework

The changes to the initial KBBPI framework, based on the feedback received from practitioners and academics, is summarised in the "Improvement Mechanism" in Figure 38.

Figure 38. The Intermediate KBBPI Framework


Knowledge Management Process Environment (KMPE)
KMP Outcome
Enablers and Barriers on Knowledge Sharing (EBoKS)
Knowledge Process Environment (KPE)
KP Outcome
DOKB
Double-loop Learning
Business Process Environment (BPE)
Single-loop Learning
BP Outcome
Business Performance
Recommendations
Improvement opportunities
Audit of the KMPs
Knowledge leadership
Knowledge coordination
Knowledge control
Knowledge measurement
Audit of the KPs
Knowledge Gap
Knowledge type & attributes
Knowledge Producer & attributes
Knowledge receiver & attributes
Organisational factors
Managerial factors
Technological factors
Audit of the BPs
Tasks
Role
Inputs, Outputs
Entering and exiting criteria
Relation of Actors
Controls
Quantitative indicators
Knowledge objects
Root Definition of BPs
Establish Project Plan
Pre-analyse "top" BPs
Get CEO involved
Improvement Mechanism

5.4 Summary

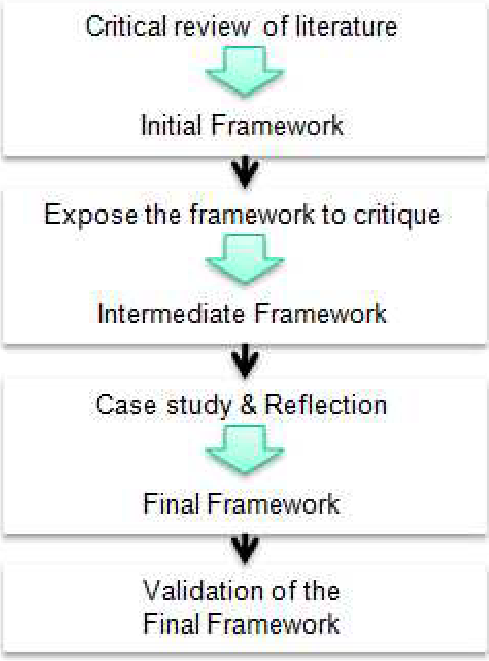
This chapter exposed the initial KBBPI framework to critique, using interviews and a focus group; it also considered the feedback received from experts. The results from the expert review were presented (5.2) and discussed in the light of required alterations or additions to the KBBPI framework. This led to a consideration of further literature and, consequently, to the integration of an implementation methodology for the KBBPI framework.

In the next chapter, the resulting intermediate KBBPI framework (Figure 38) is implemented and evaluated in a case study.

Chapter 6

Implementation of the Intermediate KBBPI Framework

This chapter explains the evaluation of the intermediate KBBPI framework in a practical setting, including the case study execution, and how the results provide a basis for the further improvement of the KBBPI framework. The chapter commences the third stage of the methodology summarised in Figure 14 of chapter 3 (repeated here):


Critical review of literature
Initial Framework
Expose the framework to critique
Intermediate Framework
Case study & Reflection
Final Framework
Validation of the Final Framework

In order to distinguish clearly between the implementation and evaluation of the KBBPI framework, this chapter is structured into two main sub-sections. The first (6.1) describes how the KBBPI framework was implemented and the other (6.2) discusses how the KBBPI framework was evaluated.

6.1 The Implementation of the KBBPI Framework

The implementation methodology for the KBBPI framework (see Chapter 3) defines the structure of this main sub-section and consists of the following sections:

a) Identification of an organisation for the case.
b) Get management support and pre-analyse organisation's top BPs.
c) Develop a project plan and form agreement with the organisation.
d) Elaborate a root definition of selected BPs to be redesigned.
e) Mapping of the BPs, KPs, and KMPs.
f) Identification of improvement opportunities.
g) Formulation of recommendations.

6.1.1 Identification of an Organisation for the Case

This research step started with considerations about selecting suitable organisations for implementation of the KBBPI framework. Based on the feedback received during the evaluation of the initial version (see Chapter 5), the researcher expected to be faced with difficulties in identifying suitable and interested organisations for the implementation.

Next to the researcher's employer (the MZSG), the researcher decided to select a further two companies as potential alternative candidates for implementation. These two companies were selected through a web-based analysis, based on their similarities with the MZSG; namely, being smaller management consultancy firms from the local region in Switzerland, offering comparable types of service, and possible suitability for implementation.

In these three consultancy firms, a management member was identified as a potential participant for interviews in order to find whether or not the firms are appropriate candidates for implementation. These managers were purposefully selected based on their functions, which meant that they must be able to decide about participation and comprised:

- The owner of the MZSG, employer of the researcher.
- CEO of a mid-sized management company with 240 employees.
- Managing partner of a small management consultancy with 18 employees.

The individuals were contacted by phone in order to provide them with some background information about the research and to identify whether or not they were willing to participate in an individual interview. Only two of the contacted individuals agreed for an individual interview and confirmed a meeting. One candidate was not interested and argued that they have no interest in KM due to their daily business and the lack of time and free resources.

The researcher prepared a short interview guide (see Appendix F), including the following memos:

1. Background information about the researcher and the research.
2. Information about expected benefits and a short description of the implementation methodology.
3. The intended results, including the potential benefits.
4. The improvement methodology and the pre-conditions.
5. The interview was intended to end with the discussion of willingness to participate, general conditions for participation, support requirements of the researcher and the next steps.

The researcher agreed to meet both managers in their offices and the interviews were conducted in the same way. Recording of the interviews seemed not to be appropriate and the researcher did not ask for permission to make a recording.

Detailed notes were taken during the interview, expanded on and clarified immediately after the interview in order to minimise errors/losses through memory. Subsequently, these notes were transcribed and the transcript was sent by email to the interviewee to confirm the validity of the transcript.

Although the researcher had two transcripts from the individual interviews (see Appendix G), analysis was limited to only one interview. After the slide presentation, one interviewee was convinced that such a project would be too large for their small organisation, which left one organisation remaining, MZSG.

The results from the interview with the owner of the MZSG were:

- Investigating a few selected BPs could be a good idea and, especially, key-account management, proposal writing, and lessons learned from assignments could be interesting.
- The major concern of the owner was that the project-costs could be high;

however, he invited the researcher to write a project proposal.

In the following sections, some basic information about the MZSG is given.

6.1.1.1 Background Information about the MZSG

The MZSG, Management Centre St. Gall, is located in St. Gall, Switzerland. The MZSG is a management consultancy and training company that was established in 1973 by the Economic Research Promotion Company of the University of St. Gall under the direction of Professor Malik; it became a joint-stock company in 1984. The MZSG has two offices located in Zurich and Madrid. Management consultancy is among MZSG's main activities and its service quality is ranked among the top 10 consultancies in Switzerland. MZSG does not focus solely on a specific industry but has a strong regional focus on the local markets in Germany, Switzerland and Austria. The company is structured in the form of four institutes around the brand of "Prof. Malik". In 2008, MZSG had around 250 employees (150 full-time employees) generating a total revenue of 80 Million Swiss Francs. The growth in recent years in employees and turnover related to 2006 is based on the acquisition of the consultancy company PIMS.

The management consultancy market experienced a remarkable boom throughout the last two decades. Especially, the European market has underwent radical growth throughout the 1990's (Wood, 2002) and was a market as big as the world consulting market only six years ago (Glückler, 2003). During the last 20 years, consultancy firms have generally grown continuously over a long period at rates far above 10% annually until the economic downturn led to stagnation in the early years of the new century. The consultancy market shows strong polarisation, in which few large management consultancies generate the major part of revenue and hundreds of small to medium sized consultancies share the remaining revenue (FEACO, 2010). The success of the global consultancies has not been restricted to their increasing market shares but also to their profitability. The profitability of MZSG experienced strong decrease of revenue in the years 2007, 2008 and 2009. The institute's consulting and education activities were partially not profitable in recent years; however, the MZSG as a whole was always profitable but no details are available. The MZSG is structured into a number of institutes, as shown in Table 19 below:

Table 19 MZSG Institutes and Provided Services

Malik Institute:	Provided Types of Services:
seminare With a revenue of 30 Million Swiss Francs in 2005	- Standard courses, general management theory - Client-specific courses
consulting & education With a revenue of 35 Million Swiss Francs in 2008 and 60 full time employees	- Strategic consulting (60% of revenue) - Client-specific services (40% of revenue)
syntegration® With a revenue of 4 Million Swiss Francs in 2008	- Services related to a standard methodology for knowledge transfer in client groups
cybernetics & bionics With a revenue of 2 Million Swiss Francs in 2008	- Services related to a new understanding of management as complex, adaptive and viable systems
PIMS® With a revenue of 6 Million Swiss Francs in 2008	- Services related to the 'PIMS approach'. PIMS consultancy acquired in 2006
malik on management® With a revenue of 2 Million Swiss Francs in 2008	- Malik's quarterly publications related to trends in general management theory, opinions and cases

These institutes provide different types of services and standardised products to the local markets of Germany, Austria and Switzerland.

At the MZSG, there are three main levels in the line organisation, which are managing partner, partner and consultants (with sub-levels of project-manager, senior consultant, consultant, junior consultant and assistants). The managing partners (co-founders of the MZSG and academic colleagues of Prof. Malik from the University of St. Gall) are, as a team, responsible for the institutes. Furthermore, the managing partners are independent from each other in managing their business inside the institute. The business concept is similar to factoring since the brand "Malik" is used for sales and marketing purposes. In this concept, the managing partners pay for the use of internal services in the form of overhead costs and they have to follow Malik's business strategy related to corporate identity, marketing and sales. Between managing partners, the markets is historically grown and divided in the form of key accounts. It is common at the MZSG for only the managing partner and partner to have long-term business relationships with clients.

The partners on the third level report to a specific managing partner and they have a comparable contract to the managing partner, in which the salary is divided into a base salary and a percentage from the profit margin from projects. It is not common to choose a skilled project manager or consultant when a position as partner is open. Almost all partners have been headhunted from large clients of the MZSG and hired with the intention to generate business based on their network within large organisations; thus, sales form the main function of the partner level.

Below the partner level, comparable with a department manager or team manager, the consultants are classified into competence groups, according to the kind of industry specialisation they have. Consultants at the MZSG are relatively young (average age of 33 years) and the MZSG suffers a fluctuation rate on the consultant level of around 20%. The high fluctuation rate at the MZSG is explained by the management to be caused by a relatively low salary and high individual risk compared with competitors. The MZSG pays a relatively low fixed salary and compensates for this with a relatively high variable percentage from charged fees. This concept works as long as consultants are working on assignments; however, in times of decreasing revenues, consultants not engaged in consultancy assignments suffer with a relatively low salary. In consequence, consultants leave the MZSG as soon as an opportunity arises.

In consultancy assignments, the senior consultants work as project managers and are fully responsible for technical, administrative and financial issues related to the project.

The last function is the assistant, who usually has limited or no experience and works with well-specified tasks under supervision from managing partners, partners and consultants.

6.1.2 Getting Management Support and Pre-analysing the Organisation's Top BPs

After having received confirmation of willingness to participate from the owner of the MZSG, the researcher's next aim was to get support for his project from higher management levels at the MZSG.

In order to create management support, the researcher decided to use a focus group. The aim was to pre-test the idea to implement the KBBPI framework at the MZSG and to discuss this option in detail with the participants. A focus group would help to get "the participants on board".

The participants of the focus group were purposefully hand-picked based on their management position at the MZSG. Four individuals were selected and a short profile of each is given in Table 20:

Table 20 Participants of Focus Group Session Pre-analysing BPs

Initials/Function	Short Profile
RK/Managing Partner	Key Account Manager, Director Consulting in Malik Institute Consulting & Education
FI/Managing Partner	Senior Consultant at the Malik Institute Consulting & Education
DC/Partner	Senior Consultant at the Malik Institute Consulting & Education
BR/Partner	Key-Account Manager, Director Education in Malik Institute Consulting & Education

A short topic guide served as a summary statement of the issues and objectives to be covered by the focus group and the following topics were included:

a) Aim of implementing the KBBPI.
b) Benefits for the MZSG.
c) Timeframe of the project.
d) Implementation methodology.
e) General condition of the project.
f) Next steps.

The participants were contacted by email, phone and in personal in order to agree a date for the focus group session. The participants were fully informed about the aim of the focus group in advance and the researcher reserved the room at the MZSG.

The same rules as in earlier interviews and focus group were applied. The focus group started with a short introduction by the researcher about the aim and purpose of the session before the discussion took place by following the topic guide. No shy or dominant individuals participated so the need to use moderating tactics was very limited.

Once discussion finished in the focus group, the researcher read back a summary of the notes taken and asked if any points required clarification. The researcher sent the transcript to the participants for verification (see Appendix H). The data analysis was limited to summarising and interpreting the data. The results confirmed that both managing partners (RK and BR - see Table 20) were potentially willing to implement the KBBPI framework at the MZSG. However, their major concern was the unknown benefit from such an implementation. In order to minimise this risk, they defined that there must be a measurable result from the implementation of the KBBPI framework. The researcher argued that it is generally difficult to measure the results from KM initiatives and, furthermore, that the results depend on the willingness of the firm to accept the outcome from implementation and to apply the recommendations.

The participants accepted this argument and defined two forms of results:

- Participants should assess the project for its usefulness during implementation and, if the project is assessed as problematic it would be stopped.
- At the end of the project, it would be evaluated by the MZSG.

It was agreed that the researcher would write a project proposal and a rough project plan and the final decision was taken on the basis of this proposal. The participants discussed the issue of costs and they suggested defining this project as an MZSG internal project and allowing the charging of its costs to the cost account of one managing partner.

The participants identified the following BPs as potential areas of interest:

- *Key account management*: RK and BR to be responsible.
- *Writing proposals*: RK, BR, DC and FI to be responsible.
- *Lessons learned from assignments*: all consultants to be responsible.

The researcher was surprised by the unproblematic acceptance and support received from higher management level.

Based on these results, the next step was to elaborate a detailed project plan and a proposal corresponding with the implementation methodology from the KBBPI framework.

6.1.3 *Write a Project Plan and Gain Agreement*

The main data source for writing the project plan and proposal was the researcher's experience as an MZSG consultant, having written many project proposals. The project plan followed the improvement methodology from the KBBPI framework. Therefore, the plan was structured in accordance with chapter 5 and consisted of the following elements (see Appendix I):

a) Initiation of the project.
b) Developing a root definition of the BPs to be redesigned.
c) Mapping BPs, KPs and KMPs.
d) Identifying improvement opportunities.
e) Formulating recommendations.

These five steps built the cornerstones of the implementation of the KBBPI framework at the MZSG. The researcher submitted the project proposal, including the rough project plan, to the managing partner. As agreed, the project plan included a project cost estimation, which totalled around 27,000 Swiss Francs. The basis for this calculation was the estimation of time effort from participants (except the researcher) in the project.

After a few weeks, the MZSG informed the researcher that the project had been approved by the managing partner.

6.1.4 *Develop a Root Definition of the BPs to be redesigned*

The expected result from this research step was a root definition of the BPs in the defined areas of interest. A root definition is a structured description of a system that is relevant to the problem. It is a clear statement of activities taking place in the organisation being studied. Based on the information received in the earlier focus group session, the researcher knew the main areas of interest.

The researcher decided to use a focus group session again because the aim was to discuss the project topics in details. The participants of the focus group were purposefully hand-picked based on their functions in the areas of interest. In total, seven individuals were selected; a short profile of each participant is given in Table 21:

Table 21 Participants of the Focus Group

Initials/Function	Relation to BP
RK/Managing Partner	Key-Account Management, Proposals and Offering
BR/Managing Partner	Key-Account Management, Proposals and Offering
DC/Partner	Proposals and Offerings; Lessons learned from assignments
CF/Consultant	Lessons learned from assignments
GC/Consultant	Lessons learned from assignments
AS/Consultant	Lessons learned from assignments
SS/Consultant	Lessons learned from assignments

A short topic guide served as a summary statement of the issues and objectives to be covered and it also included questions for each area of interest, namely:

- Who the actors are, the people who operate the process.
- The transformation that the process performs.
- The "world view" of involved people.

The participants were contacted and informed in advance about the aim of the focus group. The researcher once more reserved a room at the MZSG.

The researcher wrote one transcript from the focus group (see Appendix J). The data analysis was limited to a categorisation and interpretations of findings, which were sent to the participants for verification.

The participants confirmed all three areas to be relevant. Nevertheless, they excluded the BP relating to lessons learned because they concluded that such a process does not exist at the MZSG.

Based on the outcome from the focus group, agreement with the managing partner and the researcher was established a few weeks later. This agreement included the following topics:

- The research is restricted to the institute "consulting and education" because other institutes are legally independent companies. Correspondingly the MZSG granted only access to data and information from that institute.

- The primary aim is to improve the situation in the selected areas of interest (BPs) and to develop guidelines for similar future KM attempts at the MZSG.
- The guidelines should be potentially applicable as a consulting tool.
- The deliverables to the MZSG are defined to be:
  - A process map for the selected BPs.
  - An overview of weaknesses in the mapped BPs.
  - Recommendations with the potential to improve the selected BP.
  - A guideline for conducting similar projects.

This agreement was the basis for the implementation of the KBBPI framework at the MZSG. The next section explains how the KBBPI framework was implemented at the MZSG.

The project at the MZSG started with mapping of the BPs.

6.1.5 Mapping of the BPs, KPs and KMPs

The aim of this research step is to elaborate a process map on BP, KP, and KMP levels. The data collection methods applied in this research step were mainly semi-structured interviews because detailed in-depth information from key people was required. The topics for the interviews were pre-specified based on the applied methodology and listed on an interview guide.

6.1.5.1 Mapping Business Processes (BPs)

The objective of the first step was to map the BP in order to develop the BP model. Before the interviews started, all available documents about the selected BPs at the MZSG were reviewed, such as:

- *Existing process documentation* (partially elaborated by the researcher in earlier attempts of BP mapping).
- *Project documentation*, i.e. proposals, reports, reviews etc.
- *Uncategorised material* from colleagues, documents from other consultants.
- *Own uncategorised material*, such as minutes from the researcher’s own experience.

These documents provided early information as extension to the initial understanding of the BPs based on the researcher's experience as a consultant.

A guideline for mapping the BP in the semi-structured interviews was developed based on the identified elements from the KBBPI (Appendix L) and the interviewees were purposefully selected based on their involvement in the BPs.

Before the first meeting, a draft of the selected BPs was developed on the basis of literature, document review and researcher's own experience. An example is given in Appendix K.

An initial version of the BP model (a graphical representation of the BPs) was used as a trigger for a detailed discussion (Appendix K).

The interviews took place over a period of several months. The interviewees were contacted by the researcher and the arrangements for BP mapping were agreed.

In total, six individuals participated in the interviews and included three consultants, two partners and one managing partner. Once more, detailed notes were taken during the interview and expanded on before being clarified immediately after the interview in order to minimise errors/losses through memory. The transcripts from these interviews were analysed and the BP model continuously evolved.

Initially, MS-PowerPoint was used to visualise the BP and, at a later stage of the research process, the complete BP model was visualised in MS-Visio. For the visualisation, the classical BPMN symbols from Microsoft Visio (BPMI.org 2004, Business Process Modelling Notation (BPMN)) were used to depict the process in detail.

The innovation compared to conventional BP mapping was the mapping of knowledge objects. Finally, the developed process model was presented and confirmed in a focus group with all participants from the interviews.

The result was a validated version of the BP model. This final version was the basis for the further investigation; an example of the BP model is given in Appendix M

6.1.5.2 Mapping Knowledge Processes (KPs)

The objective of this implementation step was mapping the KPs and integrating them into the BP model. The same interviewees, as in BP mapping, participated and only a limited number of new interviewees were added.

The new interviewees were purposefully added based on their function in the investigated BPs. The ensuing interviews were arranged over a period of a few months and, in total, ten individuals participated. The researcher developed a short interview guide (see Appendix N)

The developed BP model (example given in Appendix M) served as a tool for visualisation and discussions. At the beginning of the interviews, the researcher presented the elaborated BP model and started interviewing in order to identify the knowledge problems, known as ‘gaps’.

After having identified the knowledge gaps, the discussion evolved and ended when all topics from the interview guide were covered.

The transcripts from these interviews were analysed and the mapping of the KPs was continuously improved. As before, detailed notes were taken during the interview and expanded by observations and memos.

As result of the series of interviews, the BP-KP model continuously evolved. The developed BP-KP model was presented and confirmed in a focus group session with five participants. The result was a validated version of the BP-KP model, an example of which is given in Appendix O.

Initially, classical flow-chart symbols were used for the visualisation of the BP-KP model and later extended by further symbols to develop a standardised set of symbols for mapping the KPs and a short list of questions was prepared. The innovation and change in the KBBPI framework was the developed standardised set of symbols for KP mapping.

6.1.5.3 Mapping Knowledge Management Processes (KMPs)

The last step of mapping was conducted with the benefit of the experience so far collected. Similar to the prior stages, semi-structured interviews and a focus group were applied to capture the KMPs. Mapping of the KMPs started on the basis of the BP-KP model and the same individuals participated with no new interviewees added. The meetings were arranged over a period of five months. The objective of this implementation step was to identify and assess the KMPs.

The researcher developed a short interview guide (see Appendix P) and the interviews started with a discussion based on the visualised BP-KP model. Experience from mapping the BPs showed that KMP mapping must happen on the task level.

Nevertheless, the first two interviews had already confirmed that KMPs cannot be mapped at the MZSG; therefore, the researcher decided to stop the interview process. The reason for this early end was that the KMPs simply did not exist at the MZSG.

Only two transcripts were analysed and a sample of the BP-KP-KMP model is given in Appendix Q. This sample BP-KP-KMP model was presented in a focus group session with 4 participants from the interviews.

The participants confirmed that, with the KBBPI framework, KMP mapping would be theoretically possible but impossible at the MZSG because they did not exist. An important finding from the focus group was the conclusion that, at the stage of KMP mapping, identification of recommendations for improvement was already possible.

6.1.6 Identification of Improvement Opportunities

Identification and confirmation of improvement opportunities were elaborated on the basis of the developed BP-KP-KMP model.

The analysis of the weaknesses started with a focus group because it allowed finding what participants thought and the investigation of a topic in depth and in a short time. The objectives of the focus groups session were:

- A presentation and discussion of the BP-KP-KM model.
- Identification of improvement opportunities.
- An assessment of the improvement opportunities.

All participants from processes mapping were invited to the focus group and ten individuals were willing to participate. No further topic guide was elaborated because all participants were familiar with the situation and the objectives.

An important finding from the focus group was the impracticality of discussing improvement opportunities with all of the participants. The identified improvement opportunities were very task-specific and only a few individuals were familiar enough, or interested, to discuss it. Thus, three further interviews with selected individuals were arranged in order to confirm findings.

The result of the analysis process was a categorised collection of improvement opportunities along the tasks in the BP called internally an “Improvement Opportunities Report”, an example of which is given in Appendix R.

6.1.7 Formulations of Recommendations

In this last implementation step of the KBBPI framework, the recommendations were derived from the identified improvement opportunities.

The researcher decided once again to hold a focus group session in order to investigate the improvement opportunities in depth and in a short time. All participants from processes mapping were invited to the focus group and six individuals participated in the session. Due to the familiarity of the researcher and participants with the topic and the objectives, only a list of criteria for evaluating recommendations in the focus group was elaborated, based on literature. This list included the following criteria for evaluating recommendations:

- Are they clear calls to action? That is, the recommendations should use simple and direct language, set out what needs to be done, where and when it needs to be done and by whom.
- Are they based on the evidence presented, clearly indicating why action should be taken?
- Are they meaningful for the MZSG?
- Are they likely to be implemented?

The starting point for elaboration of recommendations was the “Improvement Opportunities Report” (example given in Appendix R) and recommendations were derived on the basis of the portfolios from the report. These recommendations were written down on a white board and discussed on the basis of suggested criteria. The focus group ended with a validated list of recommendations.

After having completed the implementation of the KBBPI framework, the researcher wrote a project report comprising the BP-KP-KMP model, the collection of validated improvement opportunities and recommendations for improvement.

6.2 The Evaluation of the KBBPI Framework

The objective in this sub-section is to discuss the evaluation of the KBBPI framework in the practical setting of the case. A further objective is to reflect on the results from evaluation and the possibilities for improvement through redesign.

This evaluation of the KBBPI framework was executed in parallel and interlinked with the implementation (see Element G in Figure 38). The evaluation of the KBBPI framework was an incremental process (a part of the knowledge stream of the DBR methodology, see Section 3.4.5; Figure 11). The result from the reflective cycle generated new knowledge, which led to alterations or additions to the KBBPI framework. Consequently, the next sections include the answers are given to questions 6 to 8 stated in Table 8.

Although the evaluation process was cyclic and interwoven in order to make it more understandable for the reader, the evaluation is presented in a sequential order.

6.2.1 What Problems are Experienced During Implementing the KBBPI Framework?

As discussed in Chapter 3, the evaluation is based on the feedback received during implementation and this research step answers the question (see section 3.1.6.3): "What problems are experienced during implementing the KBBPI framework?" This research step captures the perspectives and meanings that participants assign to the implementation of the KBBPI framework.

The first data collection method applied in this research step was the participant observation applied during the whole implementation process in order to capture the problems and context of implementation. Observations during the implementation were used to determine whether or not the implementation is successful. Observations are generally useful in directly examining methods employed (see section 3.7.3.2)

The researcher, as observer, did not explicitly define criteria for describing problems. Instead, he judged the events in implementing the KBBPI framework against a continuum of own expectations. The researcher noted in a diary what he experienced as a problem during the whole implementation process.

Another data collection method present during the whole implementation process was conversational, informal interviews. Informal feedback was received from the participants, without them being asked to give feedback. These interviews were completely unstructured and the researcher followed interviewees' narration and generated questions spontaneously based on the reflection of it. The researcher made notes as soon as possible after the interview in order to minimise errors/losses through memory.

One data collection method was the formally agreed interviews with the participants. The interviews for evaluation of the KBBPI framework were, at this stage, always combined with the interviews for implementation of the KBBPI frameworks. The evaluation topics of the KBBPI framework were covered in the same individual interview by asking the participants the following three questions at the end:

- What worked?
- What did not work?
- Why did it not work?

This meant the researcher tried to consider at the end of each interview what happened and what was learned. The researcher considered asking the same three questions also at the end of the focus group sessions but decided not to do so due to the danger of endless discussions.

Detailed notes were taken during the interview and, again, these were expanded and clarified immediately after the interview in order to minimise errors/losses through memory. These notes were later transcribed and sent to the participants for verification. The transcripts were physically the same as in implementation because they stem from the same interview; simply, at the end of the transcript, the discussion for evaluation was in a separate section. Finally, an analysis of all existing data provided insight and helped to get a rich picture.

Although triangulation was present throughout the study, it is here highlighted because the evaluation of the KBBPI framework is one of the main parts of this research. A kind of methodological triangulation was achieved by combining different data collection methods, such as interviews, focus groups, observations and document analysis. Furthermore, a data source triangulation was achieved by using different personnel in interviews and focus groups at different points of time in the research process. Finally, analysis triangulation was achieved by using more than one strategy to analyse the same set of qualitative data.

6.2.1.1 Data Analysis

At the end of this research step, the researcher had transcripts from eleven interviews (several participants made only a short comment such as "went well" and they were excluded), ten memos from informal interviews and his own field-notes (a sample is given in Appendix S).

The first step of data analysis was to summarise the main categories from all sources and identify themes or patterns, as well as summarising them (see Appendix T). The last step was to organise the data into categories and patterns (see Table 22).

Table 22 Summary of Encountered Problems During Implementation

General Problems	Tools and Instruments	Methodological Problems	Conceptual Problems
• Difficulties to find an organisation • Willingness to participate • No clearly defined objectives for each step respectively not clearly communicated • Commitment from management to KM, insecurity regarding final outcome	• No data management tools • No tools for BP, KP and KMP visualisation • No appropriate notification symbols were available • Researcher's experience with BP notification	• Mapping of BPs, KPs and KMPs in three steps is problematic • Knowledge objects and attributes mapping twice in BP and KP • Too many steps in implementation	• Distinction role and individual • Missing KMPs at the MZSG • Detailing on all levels created problems • Causal dependencies unclear

The findings from Table 23 are reflected in detail in the next sections and the connections (causal dependencies) are discussed and tentative solutions suggested.

6.2.2 What are the Tentative Solutions to the Experienced Problems?

The objective of this section is to identify solutions to the experienced problems. In a first step, the problems were analysed to ascertain whether or not they relate to methodological or conceptual aspects of the KBBPI framework.

Review of pre-existing theory served as the method to identify solutions to the experienced problems.

6.2.2.1 Difficulty to Find an Organisation

As already expected by the researcher (based on the feedback from experts, see Section 5.1.7) a major problem was to find organisations willing to participate. After several attempts, only one organisation remained interested. The researcher argues that to some extent, this was caused by their lack of experience with the KBBPI framework. He further argues that if there were a list of reference sites, then the "selling" of such an approach to prospects would be much easier because it is widely accepted that the best sales tool is a list of sales references that prospects can call to get a third party opinion of the product or service.

Thus, the difficulty of finding an interested organisation is not necessarily a weakness of the KBBPI framework *per se*. The main causes of this problem were identified by the researcher as KM awareness, no time, high complexity of the framework, obvious implementation effort and the unknown cost-benefit ratio.

From these causes, only complexity and the cost-benefit ratio are attributes of the KBBPI framework. The cost-benefit ratio is currently unknown and it seems impossible to establish this information.

The second attribute concerning the complexity of the KBBPI framework could be reduced potentially. From the primary research, the researcher finds complexity as a potential barrier to implementing the KBBPI framework. Therefore, the researcher concluded that the problem of complexity relates to the implementation methodology of the KBBPI framework, which should be reduced as far as possible.

6.2.2.2 Willingness to Participate During Implementation

Although certain help was given by the fact that participants were allowed to charge some hours (for example, for participation in interviews) to the MZSG internal project, one problem was that several participants were reluctant to participate at interviews or to invest the required time. Especially, consultants were sometimes reluctant to participate because they are generally focussed on generating as much billable hours as possible. Furthermore, it was difficult to convince several participants that the invested effort in the implementation of the KBBPI framework would pay off. The researcher identified the main causes of this problem as KM awareness, no time, high complexity of the framework, implementation effort and an unknown cost-benefit ratio.

The researcher argues that this problem is caused to a greater degree by the same factors as the difficulty to find an organisation. Furthermore, there might also be relevant cultural aspects; for example, the focus on a high amount of billable hours. Nevertheless, the researcher suggests the same options to address the problem as for the prior problem of difficulty to find an organisation.

6.2.2.3 Communication of Clear Objectives During Implementation

Several participants missed clearly defined and communicated objectives for each implementation step. This was caused by the fact that the researcher was not experienced with the implementation of the KBBPI framework, which meant that the researcher was insecure and not always able to explain the next steps clearly.

The researcher argues that this problem was caused by the researcher's missing experience and not by the KBBPI framework itself. Thus, the solution to this problem does not relate directly to the KBBPI framework itself; however, it is an issue for a guideline for implementation of the KBBPI framework.

6.2.2.4 Not Properly Communicated Commitment from Management

At the end of the implementation, there was a feeling of insecurity among the participants regarding the question of whether or not their recommendations would be implemented. The researcher argues that these doubts were mainly caused by the under-communicated commitment of top management to this project and to KM in general. Furthermore, the researcher argues that this problem was caused by the environment and not by the KBBPI framework; moreover, the problem is an issue for a guideline for implementation of the KBBPI framework as a pre-requisite for implementation.

Although the KBBPI methodology specifically addresses the issue of management support, the management support during KBBPI implementation was assessed as insufficient by the participants. Thus, this issue must be at the centre of any KBBPI implementation.

6.2.2.5 Data Management Tool

The BP mapping followed traditional BPI methods and several participants were experienced in mapping BPs. In the early implementation stages, some problems regarding tools occurred because there was no specific software tool applied for data management. Especially, the use of EXCEL proved to be challenging because of the difficulties of organising the data in many files. Generally, the use of many different files and file formats made the data collection and analysis cumbersome (in the whole research process). Furthermore, the participants were interested in having the results on a web-server in order to be able to start working on the identified problems.

This problem was caused by the lack of appropriate data management software and, thus, the tentative solution is quite simple; namely, to evaluate and to use such a software tool. The researcher argues that this problem does not relate directly to the KBBPI framework and is more a general information or guideline.

6.2.2.6 Inappropriate Tool for BP Visualisation

Another problem was an inappropriate tool for BP visualisation. The graphical visualisation of the BP model was assessed as useful, especially when used in the interviews and focus groups. Often, participants used a pencil and made changes directly onto the BP model; however, the difficulty experienced was that the researcher used PowerPoint at the beginning to visualise the BP model. PowerPoint proved not to be an appropriate tool for this task and working with it was generally cumbersome. Although PowerPoint might be a powerful presentation package, it is definitely not appropriate for visualisation of BPs.

A tentative solution was quite simple; namely, to evaluate and to use an appropriate software tool. This solution also is more a general information or guideline and not an improvement of the KBBPI framework.

6.2.2.7 *Inappropriate Tool for KP Visualisation*

In KP mapping, the use of PowerPoint proved to be weak due to difficulties in practicability and time effort. Both the use of PowerPoint during mapping in interviews and in the analysis and visualisation of results were problematic. Therefore, the process modelling instrument was MS-Visio in the later stages, which was much more useful.

In this case, the tentative solution is also quite simple and the same as for the problem "*Inappropriate tool for BP visualisation*".

6.2.2.8 *Researcher's Experience with BP Mapping*

Although the notation used for mapping BPs was intuitive, the difficulties were in the details. At the beginning, a lot of time was lost with discussing details about how to visualise BPs correctly; however, this problem disappeared during the progress of the project. This problem was an indicator of the researcher's brief experience in implementing the KBBPI framework. Furthermore, the fact that during progress of the implementation this problem disappeared is a sign of the researcher learning.

The researcher argues that this problem does not, again, relate directly to the KBBPI framework itself but is an issue for a guideline for the implementation of the KBBPI framework.

6.2.2.9 *Effort for BP Mapping*

The major finding was that BP mapping should be avoided in any circumstances because too much time is otherwise lost on mapping traditional attributes of a BP. It was very problematic that no BP-maps existed at the MZSG and a lot of time was unnecessarily spent on this task. This problem is severe because it means that a relevant effort was needed for a task that is not the primary objective of the KBBPI framework.

Gronau (2005) experienced similar problems and argues that a detailed capturing of the knowledge-intensive business process is a pre-condition for the analysis and evaluation of potentials within the process. In this context, he suggests an implementation methodology consisting of the following steps for implementation of their K-Modeller:

- Identifying BPs.
- Capturing BPs (pre-condition).
- Modelling the KPs by the K-Modeller.
- Analysing of the KPs supported by the K-Modeller.
- Qualified concept (contains the optimised KPs).

K-Modeller is a software tool that supports mechanisms for analysing the processes and generating reports from the model (Gronau, 2005).

Thus, one can conclude that excluding the BP-Mapping from the methodology and defining it as a pre-condition for the KBBPI framework would have two advantages; namely, to reduce the complexity and to have identified a pre-condition for the KBBPI framework. These pre-conditions may help to be able to identify more appropriate organisations for the implementation of the KBBPI framework. Therefore, the researcher argues that a solution to this problem is declaring mapping of BPs as a precondition of the KBBPI framework.

6.2.2.10 Detailing of BP Mapping

A further relevant result from mapping the KPs was that the KPs must be mapped on the task level of the BP because the knowledge objects cannot otherwise be attached correspondingly to the BP. Thus, mapping and visualisation of BPs and KPs is very time consuming and a lot of effort is required to map the BPs, as well as the KPs. However, this effort is required because only a detailed mapping of BPs (and, thus, of KPs) allows the identification of improvement opportunities. In situations where BP-Maps already exist in an organisation, a further precondition is that these BP maps must have a very detailed level.

Nevertheless, a problem is that the required high detailed aggregation level of BPs makes the process of mapping BPs and KPs extremely complex and time-consuming.

6.2.2.11 Missing Notification Symbols for KP Mapping

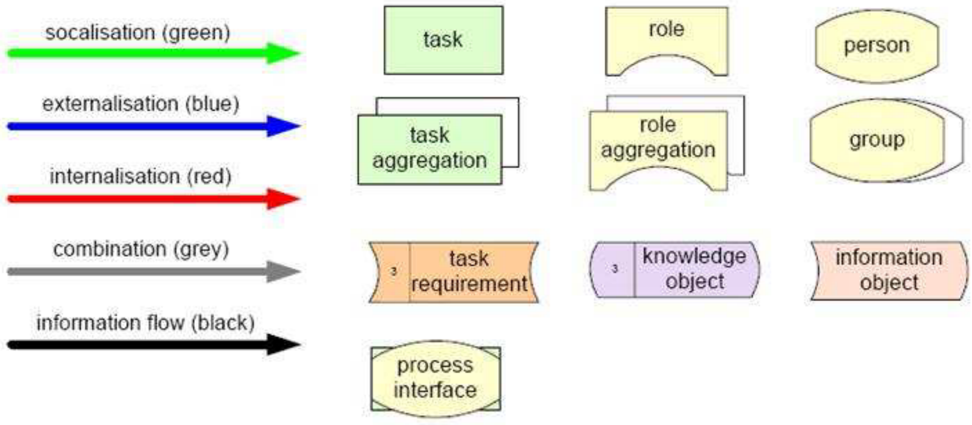
During mapping of the KPs the researcher recognised that new notification symbols for the KPs are required; thus, the researcher identified notification symbols from literature in order to be able solve this problem.

Gronau (2005) and Remus (2002) argue that conventional process modelling approaches do not fulfil all requirements that have to be considered for modelling knowledge-intensive BPs. Gronau (2005) proposes a list of requirements that have to be fulfilled for modelling knowledge-intensive BPs and, based on these requirements, he further argues that common process modelling approaches like “ARIS”, “Income”, and “PROMOTE” do not fulfil them. The result of Gronau’s evaluation leads to the formulation of requirements for the specification of a new BP-KP description language. Consequently, Gronau (2005) formulated a knowledge description modelling language (KMDL) that includes symbols for modelling knowledge processes (KPs) in BPs.

The KMDL provides a symbol library containing the basic symbols for “information object”, “task”, “role”, “task requirements”, “person”, “knowledge object”, and “knowledge descriptor”. The connections of these objects are realised by using a directed information flow and four kinds of knowledge conversion. For all of these objects, the attributes identifier, description, keywords and process description exist. Furthermore, optional attributes are defined for each of the objects.

The researcher argues that the symbols from the KMDL correspond to the needs of the KBBPI model and, as far as necessary, additional symbols could be integrated into the KMDL Symbol Library. Figure 39 shows the objects and their relations, as defined by the KMDL Symbol Library.

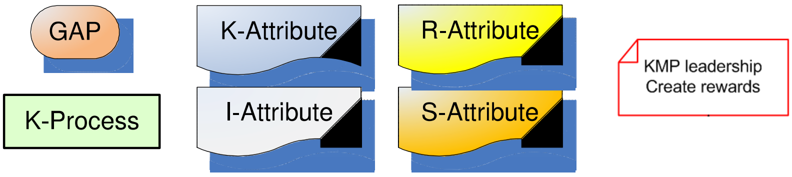
Figure 39. KMDL Symbol Library


socalisation (green)
externalisation (blue)
internalisation (red)
combination (grey)
information flow (black)
task
role
person
task aggregation
role aggregation
group
task requirement
knowledge object
information object
process interface
3
3

Source: Gronau (2005)

However, the initial definition of notification symbols from Gronau (2005) required significant changes because they were difficult to apply and incomplete in the light of the requirements of the KBBPI framework. Based on the experiences from the case, the researcher included the following notification symbols (Figure 40) in order to be able to map the KPs and KMPs, as suggested by the KBBPI framework (Figure 39).

Figure 40. Extended Symbol Library



The researcher applied the symbols from the KMDL Symbol Library in combination with his own developed symbols in order to be able to map the KPs and KMPs.
At the end of the project, participants confirmed that the developed notation symbols were intuitive.

6.2.2.12 KP Mapping on Level of Individuals

Another important problem is that the differentiation between role and individual allows mapping of employee-specific knowledge attributes. In consequence, this is very problematic because, when the individual employee changes, such as to job change, then the same role may receive other knowledge attributes as a consequence. Thus, the BP-KP-KMP model is, in principal, a ‘snap-shot’ and should be updated at every relevant change of employees. Mapping of individual attributes might also be problematic due to ethical considerations.
The researcher argues that the decision whether or not individual attributes should be mapped is a question that must be answered in the specific situation of implementation.

6.2.2.13 KMP Mapping - Missing KMPs

The first two interviews intended to map the KMPs showed that no discussion about existing KMPs was possible at MZSG because KMPs were non-existent there. Thus, the participants and the researcher decided to stop KMP mapping after two interviews. As discussed (6.2.2.14), the identified KMPs in the BP-KP model already represents, in principle, recommendations for improving the KPs. This finding was important because, initially, it was unclear if the lack of these activities was based on the fact that the developed model was not applicable and needed revision, or if the identification of the lack of KMPs was already an important contribution to practice from the implementation of the KBBPI framework.

The feedback showed that the lack of those activities could not be explained by relevant KMPs being missing. All interviewees confirmed in the final focus group discussion that the KMPs mentioned are important for the execution of the KPs and for the execution of the BPs. The interviewees assessed identifying the lack of such activities in the organisation as a contribution to their practice and confirmed the value of the KBBPI framework implementation delivered at this stage.

6.2.2.14 Identification of Improvement Opportunities in BP Mapping

A further relevant result was that the identification of improvement opportunities must happen during BP mapping or the effort to restart the discussion and to understand what is going on at such a detailed level is too high. Furthermore, it became evident from the case that the identification of opportunities already happened through identifying the gaps in the BP, the attributes on the KP level and the requirements on the KMP level.

A further problem was that, during the identification process of knowledge objects, it became obvious that the element ‘knowledge type’ should already be mapped at this stage and not, as initially assumed, during mapping the KPs. The experience from implementation confirmed that mapping of knowledge objects and knowledge types should be integrated into one single step in BP mapping.

In this section, the solutions to the problems experienced have been identified and discussed. The next section discusses how the participants perceived the proposed alterations or additions to the KBBPI framework.

6.2.3 How are the Proposed Alterations or Additions to the KBBPI Framework Perceived?

As in earlier situations, purposive sampling was applied, the participants being hand-picked based on their experience in the fields of BPI and KM and on the extent of their involvement in the implementation. All participants were familiar with the project and were also, to some extent, experts in the field of process management. In total, eight individuals were invited for the focus group and six agreed to participate. This focus group was one of the few situations in this research in which the researcher was allowed to tape record the discussion.

The topic guide included a short description of the problems and the corresponding proposed solutions and was distributed in advance to the focus group (see Appendix U). The discussion was structured around the topic guide and progressed to plan without any problems due to the participants' familiarity with the issues. At the beginning, the discussion tended to move in the direction of 'selling' the KBBPI framework as a consultancy tool.

As before, once the focus group session finished, the researcher read back a summary of the issues discussed and asked if any points required clarification. Since the discussions of the focus group were tape recorded, the researcher made only a few notes about how he perceived the session. A few days later, the researcher wrote the transcript from the recorded discussions and sent it to the participants for verification.

In this research step, the themes were pre-defined by the topic guide and the analysis was undertaken to identify patterns and summarise the findings, (see Appendix V), as well as to develop categories and to interpret them. The findings from this research are discussed in more detail in the following sub-sections.

6.2.3.1 Lack of Experience with the KBBPI Framework

The discussion in the focus group revealed that several of the problems were caused by the researcher's lack of experience with implementation of the KBBPI framework. The participants argued that the researcher initially presented the KBBPI framework as a highly complex theoretical framework and overstated the theoretical aspects. They further argued that this was counterproductive because they feared that the effort required would be high and, from a marketing and sales perspective, this was wrong. One participant stated: "*you don't need to explain how it works but you have to explain the benefits!*" Another participant added that "*I don't care about how it works! You must only explain the objectives and the benefit to me*". Evidently, the researcher had missed applying an appropriate sales and marketing strategy to bring people on board! The conclusion was drawn that this relates to the problems

“Difficulty to find an organisation” and “Willingness to participate”.

Another problem caused by the researcher’s lack of experience was “*Communication of clear objectives during implementation*”. A further participant stated “*You have not been able to explain exactly why we are doing this at the moment!*” Again, the participants concluded that this problem was mainly caused by the lack experience of the researcher (inevitable given the research circumstances) and much less by the complexity of the KBBPI framework itself.

The problem (Table 22) of “Not properly communicated commitment from top management” was assessed by the participants to be mainly caused by the lack of a proper launch meeting. They suggested that a launch meeting with the senior management was a must. The researcher recognised his responsibility in not organising such a ‘kick-off’ meeting in order to make the management commitment visible to the participants.

A further problem was identified as caused by the lack of the researcher’s experience in implementing the KBBPI framework; namely, “Researcher’s Experience with BP Mapping”. However, this problem disappeared during the progress of implementation as a consequence of the researcher learning.

The last points assessed as being caused by lack of experience were “Data Management Tool”, “Inappropriate tool for BP visualisation”, and “Inappropriate tool for BP visualisation”. The participants confirmed the existence of such problems but pointed out that the solution is easy to evaluate and to apply the appropriate software tools for such a project.

The conclusion from this discussion was to include these topics in the guidelines for application of the KBBPI framework.

6.2.3.2 Methodological Problems with the KBBPI Framework

The participants assessed the two problems of “Effort for BP Mapping” and “Detailing of BP Mapping” as really one problem. They argued that the effort and detailing is not the central problem because, in BPI projects, it is a common fact that mapping of BPs is very time consuming. They identified that the purpose of mapping was not explained enough and was a main problem. Furthermore, they confirmed that it would be helpful to declare the existence of BP maps to be a pre-condition because this would reduce the complexity in the implementation methodology of the KBBPI framework.

A further methodological problem of "Identification of Improvement Opportunities in BP Mapping" was identified. The participants confirmed the practicability of the suggested solution of having only one mapping step, including both KP and KMP mapping. The participants argued that they expect this to contribute a massive reduction of complexity in the KBBPI framework. The conclusion was that the implementation methodology in the KBBPI framework should consist of only three main phases, which are planning, mapping and recommendations, and further details should be included within these three main phases as far as necessary.

6.2.3.3 Conceptual Problems with the KBBPI Framework

The participants assessed "No appropriate notifications symbols" as a conceptual weakness of the KBBPI framework and confirmed that the symbol library developed was working well at the end of the project because the developed notation symbols were intuitive and useful. The symbol library was assessed to be a very important tool and the participants suggested explaining the symbols in advance of mapping in the form of a training lesson.

A very interesting discussion evolved around the problem *"KP mapping on the level of Individuals"*. In contrast to the researcher's expectation, it turned out that this problem was assessed as one of the main advantages of the KBBPI framework. One participant stated: "*This is exactly the difference between the KBBPI framework and other approaches! Your model is able to identify specific knowledge problems on an individual level! I know now where the problems are and why I should share my knowledge with BR (one of the managing partners)!*"

In the next Chapter, the solutions identified for the problems experienced are incorporated into the final version of the KBBPI framework.

6.2.4 Summary

This chapter explained the implementation and evaluation of the intermediate KBBPI framework in the practical case setting of the MZSG. It explained how the case study was executed and how the results provide the basis for the further improvement of the KBBPI framework.

The first main sub-section (6.1) indicated how the KBBPI framework was implemented using the implementation methodology from the KBBPI framework. It explained in detail each implementation step and presented the progress of the implementation process.

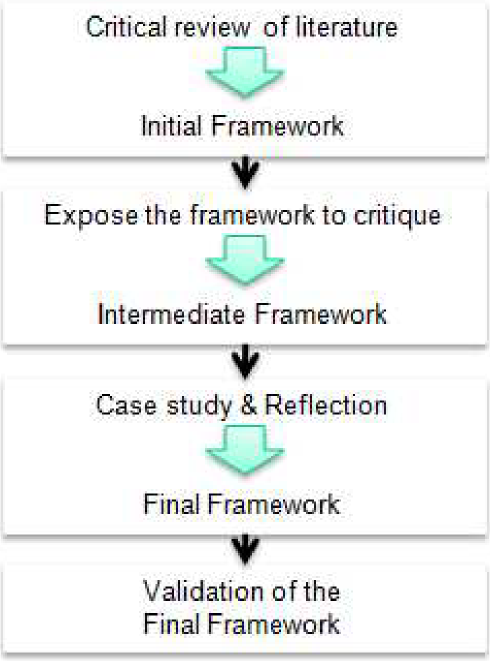
The second main sub-section (6.2) discussed in detail how the KBBPI framework was evaluated. It presented (6.2.6) the problems experienced during implementation and explained how the data was collected, analysed, and the findings reflected. It further explained (6.2.2) how solutions to the problems experienced were derived and it presented those tentative solutions. The last sub-section (6.2.3) explored how the alterations or additions to the KBBPI framework were perceived.

The next Chapter incorporates the elaborated alterations or additions into the KBBPI framework and presents its final version.

Chapter 7

The Final KBBPI-Framework

This chapter explains the incorporation into the KBBPI framework of the alterations and additions developed in Chapter 6 and it presents the final version. The chapter concludes the third stage of the methodology summarised in Figure 14 of Chapter 3 (repeated here):


Critical review of literature
Initial Framework
Expose the framework to critique
Intermediate Framework
Case study & Reflection
Final Framework
Validation of the
Final Framework

This chapter starts with the methodological alterations (7.1), followed by explaining the conceptual alterations and additions (7.2) and presenting the final version of the KBBPI framework (7.3). In the last section (7.4), recommendations for a successful implementation are set out.

7.1 Methodological Alterations and Additions

Three methodological changes to the KBBPI framework's implementation methodology are suggested by the findings from section 6.2.3:

a) Have three main phases: Planning, Mapping and Recommendations.

b) Have only one mapping step, including both KP and KMP mapping.

c) Include "identification of improvement opportunities" in KP-KM mapping.

In many cases, BP mapping might be obsolete in (a) above because adequate BP maps exist in some organisations; therefore, BP mapping can be defined as a precondition or optional step depending on whether or not adequate BP maps exist. Where they exist in satisfactory detail and quality, a BP mapping element does not take place.

Regarding (b) above, the KBBPI framework should be altered so that mapping of the KPs and KMPs is one step, where the improvement opportunities are identified during that mapping process.

Finally, as (c) above, recommendations are an outcome from the analysis of improvement opportunities and refer to the improvement of the KMPs and KPs. These changes are supported from literature; for example, Gronau (2005) and Remus (2002) suggest similar implementation methodologies. These alterations to the KBBPI framework are incorporated in the improvement mechanism (see Figure 41).

One consequence of these considerations is that all traditional BP mapping elements can be removed from the KBBPI framework because BP mapping is declared to be a pre-condition (that will frequently be met) and thus is not an integral part of the KBBPI framework anymore.

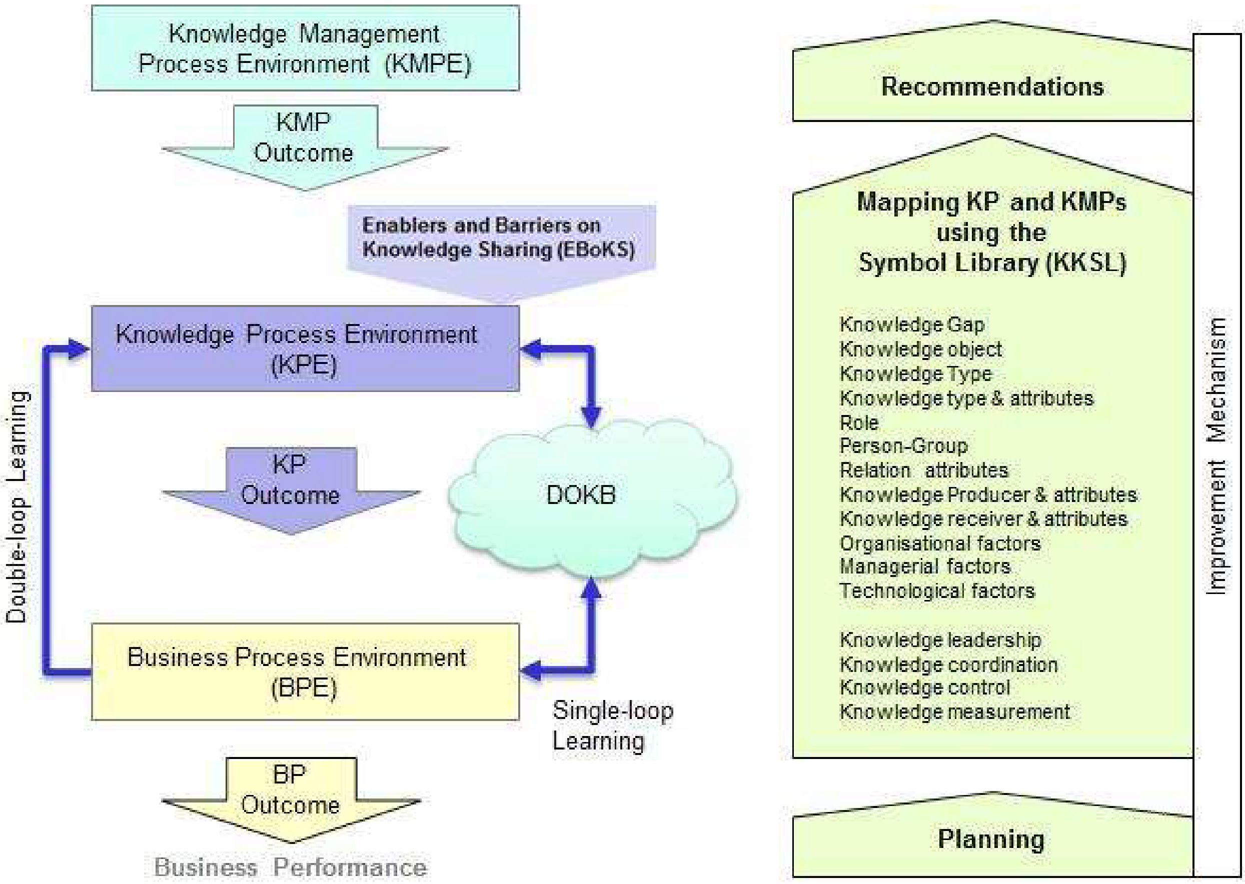
7.2 Conceptual Alterations and Additions

One change to the KBBPI framework's concept is suggested by the findings from section 6.2.3; namely, the integration of the symbol library for KP-KMP mapping into the KBBPI framework. The need for the symbol library was confirmed during mapping of the KPs and the researcher recognised that specific notification symbols for mapping are required. Notification symbols suggested by Gronau (2005), known as knowledge modelling description language (KMDL), were found to be applicable to the domain, corresponding to the needs of the KBBPI framework. However, the KMDL set were found to be incomplete in this context and additional symbols were formulated and integrated with the notation symbols set. The researcher applied the combined set to map the KPs and KMPs. At the end of the project, the developed notation symbols were confirmed by the participants as intuitive and useful for the intended application. Thus the KP-KMP symbol library (KKSL) is incorporated into the KBBPI framework (see Figure 41).

7.3 The Final KBBPI Framework

The above considerations are incorporated into the KBBPI framework and Figure 41 presents the final version.

Figure 41. The Final KBBPI Framework


Knowledge Management Process Environment (KMPE)
KMP Outcome
Enablers and Barriers on Knowledge Sharing (EBoKS)
Knowledge Process Environment (KPE)
KP Outcome
DOKB
Double-loop Learning
Business Process Environment (BPE)
Single-loop Learning
BP Outcome
Business Performance
Recommendations
Mapping KP and KMPs using the Symbol Library (KKSL)
Knowledge Gap
Knowledge object
Knowledge Type
Knowledge type & attributes
Role
Person-Group
Relation attributes
Knowledge Producer & attributes
Knowledge receiver & attributes
Organisational factors
Managerial factors
Technological factors
Knowledge leadership
Knowledge coordination
Knowledge control
Knowledge measurement
Planning
Improvement Mechanism

In the next section, some considerations and recommendations for successful implementation of the KBBPI framework are presented.

7.4 Recommendations for Successful Implementation

The discussion in Chapter 6 showed that several of the general problems during implementation were caused by the researcher's lack of experience regarding the implementation of the KBBPI framework. One can summarise these (section 6.2.3.2) as follows:

- Lack of an appropriate approach in order to "sell" the implementation of the KBBPI framework to organisations and to participants in the early stages of the project.
- Reference users, including the strong points of the method.
- Complexity of the KBBPI framework caused by the attempts to explain its foundation from theory.
- The need for a launch or kick-off meeting with members of top management, demonstrating their backing.
- A lack of experience with BP mapping.
- Lack of an appropriate data management tool and a tool for BP visualisation.

The lack of experience is inevitable given this is a research context. In the longer term, it suggests a need for focussed training.

The researcher concludes that these are important insights regarding how to implement the framework successfully and thus includes these points in the form of recommendations in the following guidelines for implementation of the KBBPI framework.

7.4.1 Guidelines for Implementation of the KBBPI Framework

A framework for knowledge-based diagnosis and improvement planning of business processes has been developed using a small Swiss management consultancy as a case study. The nature of a "framework" is that it is essentially a "solution concept", i.e. not a standardised solution into which local data is input and from which an answer emerges. It must be configured to a specific context of application. This holds for the KBBPI framework. Therefore, for successful implementation, it is desirable to have guidelines for that configuration/implementation. Recommendations follow that are based on the experience of this research.

7.4.1.1 Create Awareness

As discussed in section 6.2.3.1, the implementation of the KBBPI framework suffered typical project management problems; namely, lack of management support, which led to difficulties and resource conflicts because key resources (individuals) were unavailable when required.

Thus, for a successful implementation of the KBBPI framework, management support is a requirement, which means agreeing clear project goals with the senior management. Senior management must agree that the project is important and will add value to the business. If management support is missing, people and funding resources may not be available for the project. If an organisation has a multitude of projects, management support may be limited to only those key to the business success.

Generally, lack of management support is recognised as a major reason for project failures.

For a successful implementation of the KBBPI framework senior management support is required; therefore, the first activity before implementing the KBBPI framework must be to create awareness in order to "sell" the implementation of the KBBPI framework to organisations and to get participants in the early stages of the project on board. Thus, individuals who are involved in the early implementation phases of KBBPI framework should be familiar with selling skills and techniques.

However, the theoretical foundation of the KBBPI framework should not be the focus of sales or implementation discussions in order to avoid the impression of high complexity. It should be presented to the end-user as a black-box with a defined functionality and explanations should only be given when asked for. However, facilitators implementing the framework should be familiar, not only with its practical "nuts and bolts" (project management) but also with the central concepts of the KBBPI framework (KM expert knowledge) so as to be able to explain where necessary and fully exploit the catalytic nature of the application.

7.4.1.2 The Facilitator as Project Manager

This study shows that success of the KBBPI framework is influenced by the knowledge and skills of the person leading its implementation as project manager. Thus, a further pre-requisite for a successful implementation are the project management skills of the facilitator; for example, organisational and leadership experience, ability to coordinate a diverse resource pool, communication and procedural skills.

One can conclude that a senior project manager" is required for a successful implementation of the KBBPI framework.

7.4.1.3 The Facilitator as KM Expert

The findings from the case also confirmed that some expert knowledge is required. Thus, a suitably experienced expert as facilitator is required with skills and experience in BPI, KM, and change management at a senior level. The facilitator should not only have the ability to understand the context and use of the KBBPI framework but also the ability to facilitate the participants through the process of implementation within the context in which it is being applied.

7.4.1.4 Tools and Techniques

Appropriate software tools should be available in several application areas; for example, data management (e.g. MS-Project), presentations (e.g. Excel), and BP mapping and visualisation (e.g. MS-Visio or ARIS, Bonaparte).

7.5 Summary

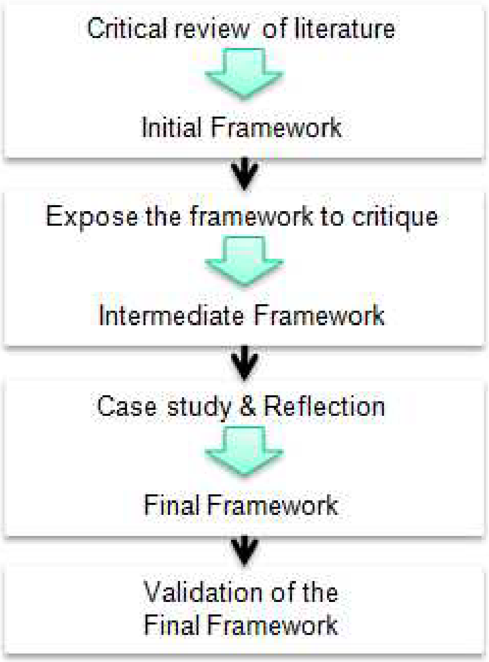
In this chapter, the alterations and additions suggested from implementation and evaluation (Chapter 6) were incorporated into the KBBPI framework and the final version presented. Finally, from the collected experience from implementing the KBBPI framework, recommendations were derived and effective guidelines formulated for the implementation of the KBBPI framework.

In the next chapter, the validity of the KBBPI framework as a solution to the research gap is explored.

Chapter 8

Validation of the Final KBBPI Framework

The objective in this chapter is to confirm that the KBBPI framework is suitable for its intended use. The chapter is the final stage of the methodology summarised in Figure 14 of Chapter 3 (repeated here):


Critical review of literature
Initial Framework
Expose the framework to critique
Intermediate Framework
Case study & Reflection
Final Framework
Validation of the
Final Framework

This chapter starts in 8.1 by discussing how the KBBPI framework was validated before it then continues in 8.2 by presenting the results from that validation. Finally, the researcher summarises the outcome in 8.3.

8.1 Validation Procedure

According to Leeflang et al. (2000), validation is an important element in the process of developing a framework and this assesses its success. He suggests three possible decisive validation factors for the framework:

a) The degree to which the results are in accordance with theoretical expectations or well-known empirical facts.
b) The degree to which the results satisfy statistical criteria or tests.
c) The degree to which the result is relevant to the original purpose.

The nature of this research is such that the concept of theoretical projections of performance necessary for route (a) is not appropriate. Undertaking an extended trial of the framework in an organisation and collecting performance information would seem an ideal option, as in (b), but such a trial is not within the scope or timeframe of this research. In substitution for such a trial and evaluation, a panel of appropriate experts may be consulted for their assessment of what the outcome of a trial would be which complies with route (c).

Richey (1997) also discusses validation in the forms of reference to literature and theoretical validity, expert review, usability documentation, component investigation and field evaluation. Again, given that this KBBPI framework was, in its first stage, developed from literature, the first option is not appropriate. The inapplicability of a trial has been discussed already and review by a panel of experts remains the best option.

In the context of this study, the KBBPI framework can be validated by such expert opinion assessing the degree to which the performance corresponds with the intended functionality and application (see Chapter 4). A possible agenda includes:

- Identification and management of knowledge domains.
- Identification of knowledge deficits that can be remedied.
- Identification and management of knowledge processes that can be treated as separate organisational processes.
- Improvement and intervention of the KPs.

Delitto et al. (1989) defines an expert as "a person who is very skilled or highly trained and informed in some field." The importance of the definition lies in both the "highly skilled" and "well informed". Although being highly skilled is a pre-requisite, on its own, it is certainly insufficient to achieving status as an expert Delitto et al. (1989). The domain and context familiarity of this study require particular specialist expertise.

The notion of a validation panel is equivalent to the focus groups used elsewhere in this research. It is an effective technique for eliciting views and opinions, as well as allowing a topic to be investigated in depth and in a short time. The question of time was a real practical issue because it was not realistic to expect that, at the end of the project, the members of the MZSG and experts from the University of Applied Sciences in Chur would be willing to participate in an extended process, e.g. a series of interviews.

Based on the above considerations, the researcher selected experts in the field of KM and BPI, familiar with the study. These experts included individuals who had participated in the evaluation of the initial version of the KBBPI framework (see Chapter 5), consultants who took part in many of the mapping implementation steps, plus an independent academic (from the School of Management, University of Applied Sciences, Chur, Switzerland).

Seven participants were selected from the MZSG Management Consultancy and one from the University of Applied Sciences; a short profile of each of the participants is given in Table 23.

Table 23 Participants' Profiles in Validation

Initials/Function	Short Profile
FM/Owner of the MZSG	Academic and practitioner, senior manager, over 35 years of experience in consulting. Specific experience: general management.
RK/Managing Partner	Practitioner, senior manager, over 20 years of experience in consulting. Specific experience: process management.
BR/Managing Partner	Key-Account Manager, Director of Education in the Malik Institute Consulting & Education.
DC/Partner	Practitioner, senior manager, over 10 years of experience in consulting. Specific experience: process re-engineering and organisational change.
FI/Partner	Practitioner, senior manager, over 15 years of experience in consulting. Specific experience: process re-engineering and organisational change.
GC/Consultant	Consultant, 6 years of experience in consulting. Specific experience: business strategy development.

AS/Consultant	Consultant, 3 years of experience in consulting. Specific experience: product document management systems.
SS/Consultant	Consultant, 4 years of experience in consulting. Specific experience: communication and marketing.
MM/Academic	Academic, senior lecturer: Organisation and human resource management, experienced with KM.

All confirmed their willingness to participate in this final focus group. The researcher again developed a topic guide, including a short list of questions and objectives to be covered by the focus group, as follows:

- Introduction by the researcher:
  - Recapitulation and summary of made experiences.
  - Objectives of the focus group.
- Intended functionality of the KBBPI framework formulated in the form of questions to be discussed:
  - Does the KBBPI framework allow identifying knowledge deficits that can be remedied?
  - Does the KBBPI framework allow improvement of knowledge processes?
  - Does the KBBPI framework allow improvement of knowledge management processes (respectively of KM)?
  - Do you recognise an improvement of the BPs caused by the KBBPI framework?
  - Concluding question: Will you implement the recommendations derived from the project?
- Any final statement?

The same rules as in earlier focus groups were applied. Initially, not all participants took an active part in the discussion because the owner of the MZSG was present. The facilitator actively tried to stimulate all participants to take part and, as time went on, almost all participants took a full part. Generally in this study, individuals from the MZSG had not felt comfortable with tape recording discussions (for unknown reasons) and, thus, the same rules about making notes and producing a transcript were applied. Once the focus group discussion ended, the researcher read back a summary of the notes taken and asked if any points required clarification or needed to be added.

Due to the fact that this was the final session of the project, the researcher took the opportunity to thank all those who had participated, especially the owner of the MZSG.

The data analysis followed the same rules as in earlier research steps and the results are summarised in Appendix W.

8.2 Results from Validation

In the following, the results from the focus group are discussed under the stated agenda questions.

8.2.1 Does the KBBPI framework allow identifying knowledge deficits that can be remedied?

The participants concluded that the identification of knowledge gaps in the BP succeeded. Despite this, some participants argued that the resulting knowledge gaps were no surprise to them. The researcher argues that the implementation was not intended to generate surprising insights but to reveal and highlight. Through a consultancy process, it is common that surprises rarely occur. One participant's statement was: "*the real benefit was created not by the identification of the gaps but by explaining what is necessary to solve it and to explain the causes*".

Similar arguments were that the implementation of the KBBPI framework showed not only the knowledge gaps but also suggested, at least partial, solutions to the knowledge gaps identified. One participant summarised this as "*Real benefit from mapping the BPs occurred only when the identification of the gap was followed by an action*".

In summary, the participants argued that mapping of the BPs definitely identified knowledge gaps in the BPs but did not highlight fundamentally new insights. Nevertheless, one participant confirmed "*I think it was really helpful because now I know the specific knowledge problem and also a potential solution to it!*"

Some participants questioned the extent to which the effort of mapping of BPs was worthwhile in relation to the potential benefits. The argument was "*we spent hours for mapping and I do not see real results!*" The researcher argues that the extent of results depends also on the willingness to implement the recommendations and, without this commitment, this process is unproductive.

An interesting comment was made by a participant; namely, "*I'm assuming that the knowledge gaps could be categorised. There is not only one kind of knowledge gap! There might be, for example, knowledge gaps that do not require further investigation and thus, by identifying these categories, the effort for further analysis could be reduced*". The researcher noted this as an idea for future research.

Despite critical comments regarding the cost-benefit ratio (reflecting results within the study (Sections 5.2.3.2 and 6.2.2.1), the participants confirmed that the functionality of the KBBPI framework in identifying knowledge deficits that can be remedied was valid.

8.2.2 Does the KBBPI Framework allow improvement of knowledge processes?

Some participants confirmed that the identification of the attributes (barriers and enablers) affecting the knowledge processes was really helpful. Some of the participants also confirmed that implementation of the KBBPI framework, especially the mapping of KPs, had already changed their practice (their BP).

One participant stated that, from his point of view, "*especially the identification of problems or attributes in relation to individuals and groups is very interesting and brought important insights!*" However, one critic argued that these were "*issues we already knew before!*" The reply to this critique came from other participants who argued that generally in consultancy it is the case that really new insights are rare and the product is to reveal or highlight what is known.

Altogether the functionality of the framework being able to improve the KPs was confirmed by the participants.

8.2.3 Does the KBBPI framework allow improvement of knowledge management processes (respectively of KM)?

The main conclusion was that the delivered project report from implementation of the KBBPI framework already confirmed, to some extent, the functionality of the KBBPI framework. One participant stated: "*The recommendations in the project report have (already) been presented and they seem to be very useful!*"

Another participant added "*I like that, in the project report, the recommendations were made on a very specific level. This is exactly the difference to many other KM approaches where some general rules are defined in order to define a KM strategy; and at the end nothing happens!*" However, other participants expressed criticism, pointing again to the question of cost benefit ratio.

Nevertheless, it was concluded that the KBBPI framework allows the improvement of KMPs and, in particular, the definition of KMPs in cases where the KMPs are missing.

8.2.4 Do you recognise an improvement of the BPs being caused by the KBBPI framework?

The conclusion was that an improvement of the BPs at a detail level was achieved, but not more widely.

The researcher argues that there are two responses to this critique; namely, that the recommendations were not implemented yet (the client's decision) and that a BPI project is, by definition, not intended to cause fundamental change of a BP.

Further, the participants argued that the improvement might simply be small - visible but not measurable. Some participants argued that such KM improvements are rarely measurable and that this is not a specific weakness of the KBBPI framework but generally of KM.

8.2.5 Do you implement the recommendations?

The final question relates not directly to the functionality of the KBBPI framework but much more to the willingness of the organisation to implement the recommendations. The owner of the MZSG argued "*Yes, we will definitely implement some of the changes but certainly not all! I'm not willing to change my organisational structure,* *although this may have been, to some extent, a barrier to knowledge sharing! I know this but I see more benefits in the chosen organisational structure*".

The managing partner added "*in my department, several changes have already been implemented*".

8.2.6 Further Results

A further effect confirmed, not directly relating to the intended functionality, was that the KBBPI framework led to a wider awareness of the relevance to manage knowledge and an increased (collective) willingness for knowledge sharing. The participants assessed the implementation of the KBBPI framework as successful because it brought awareness about the importance of knowledge and KM at the MZSG. The implementation forced the participants to acknowledge KM as a real problem and to act accordingly. The KBBPI framework justifies KM initiatives by improving the understanding of the relevance of knowledge and its management in BPs.

The KBBPI framework helps the management to set priorities and gives direction to actions. It supports the management decision process regarding KM in the sense that it helps to identify and to set priorities, as well as to allocate the required resources for KM. In this sense, the KBBPI framework contributes to improving KM at the organisation.

8.3 Summary

The validation panel confirmed that the KBBPI framework fulfilled the intended functions, operated successfully, and improved performance. Several specific benefits were confirmed by the participants, namely that the KBBPI framework allows:

- Identifying knowledge deficits that can be remedied.
- Improvement of knowledge processes.
- Improvement of knowledge management processes (respectively of KM).

Furthermore, the participants confirmed that this approach is innovative and that they had not been confronted with such an approach before. It clearly challenged their *status quo*.

Based on the panel results (as well as the earlier case study results – Chapter 6), the KBBPI framework's validity is confirmed.

One can conclude that results from the case and from the validation panel are based on traceable sources ultimately confirming the usefulness of the KBBPI framework regarding its intended functionality. Thus, the KBBPI framework is a viable option for knowledge-based diagnosis and improvement planning of business processes.

In consequence, the KBBPI framework fills the research gap in the field of knowledge-based business process improvement frameworks.

Chapter 9

Conclusion

The aim of this research, "to design and evaluate a framework for knowledge-based diagnosis and improvement planning of business processes", was set out in section 1.3, accompanied by five objectives that would realise that aim.

This Chapter starts (in 9.1) by indicating how those objectives were fulfilled, followed (in 9.2) by the framework that fulfils the aim itself. It continues (9.3) with a discussion of how this research contributes to theory and practice. Several directions for further research are then suggested (9.4) and, finally, the researcher reflects on this research experience (9.6).

9.1 Fulfilling the Objectives

These sections refer back to the objectives as stated in Section 1.3.

9.1.1 *Rigorously Define the Research Gap in the Field of KM and BPI*

This objective was dealt with in Chapter 2, confirming the knowledge gap in the field and thus validating the research aim by a thorough review of relevant literature.

The review of literature showed that all organisations, especially knowledge-intensive business services (KIBS), have to manage knowledge. In KIBS, the BPs are typically knowledge-intensive because their value can only be created through the fulfilment of the knowledge requirements of the process participants. Due to its focus on BPs, the new generation of KM (NGKM) framework proposed by Firestone & McElroy (2003) was identified as particularly relevant for this research. The key idea in the NGKM is the knowledge life cycle (KLC), which is founded on the notion that knowledge is created in response to organisational need, transferred or shared among organisational agents, and then used in decision making.

An important consequence of the NGKM for this research is the distinction between KM and knowledge processing because it implies that KM does not directly manage knowledge outcomes, but impacts knowledge processes (KPs) which, in turn, impact the outcomes of BPs. These considerations led to the discussion (Section 2.3.5) of business process-oriented knowledge management (BPOKM) as a fusion of the fields of BP management and KM, proposing support for weakly structured, knowledge-intensive BPs.

In the field of BPOKM, several different approaches can be distinguished, one of which is knowledge-based business process improvement (KBBPI), i.e. the use of KM to improve BPs. Several authors, such as Dalmaris (2006), Strohmaier (2005), Gronau (2005) and Remus (2002), argue that, in the field of BPOKM, newer knowledge management approaches and human performance issues have been neglected, indicating a research gap in the field (Section 2.4). The literature review further confirmed that it is appropriate to bridge that research gap with a comprehensive approach or framework that would provide guidance on how to improve knowledge-intensive BPs from a KM perspective.

9.1.2 Determine a Methodology to Address the Gap

This objective was dealt with in Chapter 3 in which a new form of DBR methodology was evolved.

It was concluded that this research was interpretive rather than critical because the evaluation of the framework is an inter-subjective social construct with multiple views and the research should follow an interpretive single case study with an action research approach (Sections 3.1 and 3.2). Andriessen's (2006) multiple case and action research-oriented design-based research (DBR) methodology (Figure 8) was combined with Reeves (2006) single case DBR methodology (Figure 9) and validation incorporated (previously absent). This facilitates a cohesive single-case DBR methodology (Figure 9), which incorporates the four main stages of the research presented in Figure 13.

Chapter 3 also addressed the issue of the relevant research methods and their use, e.g. conducting observations, interviews and focus groups (operational details are given in Chapter 5) and a framework for data analysis (see Figure 12).

9.1.3 Apply the methodology for bridging the gap

This objective was dealt with in Chapter 4 where the first step was to develop an initial, tentative KBBPI framework from the published literature. The KBBPI framework is a comprehensive construct that makes explicit fundamental assumptions and concept specification. Several threads of thought from two separated bodies of knowledge, KM and BP, were used as cornerstones. The literature in these fields provided a sound basis for the development of the initial KBBPI framework (see Figure 37). The KBBPI framework includes several elements (see section 4.7) which represent its fundamental constructs and assumptions. The concept in the KBBPI framework includes the ability to identify and to analyse all of the required entities, their relations and related rules on all three levels, the BPs, the KPs, and the KMPs. A further conceptual component in the KBBPI framework is the improvement mechanism.

This objective was also dealt with in Chapter 5 where the initial KBBPI framework was exposed to critique and the feedback received from experts was considered and, drawing on further literature, a number of improvement actions for the framework were made.

9.1.4 Evaluate the Solution in a Practical Setting

This objective was dealt with in Chapter 6 where the implementation and evaluation of the intermediate KBBPI framework in the practical case setting of the MZSG was explored. It was explained how the case study was executed and how the results provided the basis for the further improvement of the KBBPI framework.

The first main sub-section (6.1) indicated how the KBBPI framework was implemented, the second (6.2) discussed in detail its evaluation and explained (6.2.2) how solutions to the problems experienced were derived and it presented the proposed solutions. The last sub-section (6.2.3) explored how the alterations or additions to the KBBPI framework were perceived.

This objective was also dealt with in Chapters 7 and 8. Chapter 7 explained the incorporation into the KBBPI framework of the alterations and additions and presented the final version and Chapter 8 confirmed that the KBBPI framework is suitable for its intended use and worthwhile.

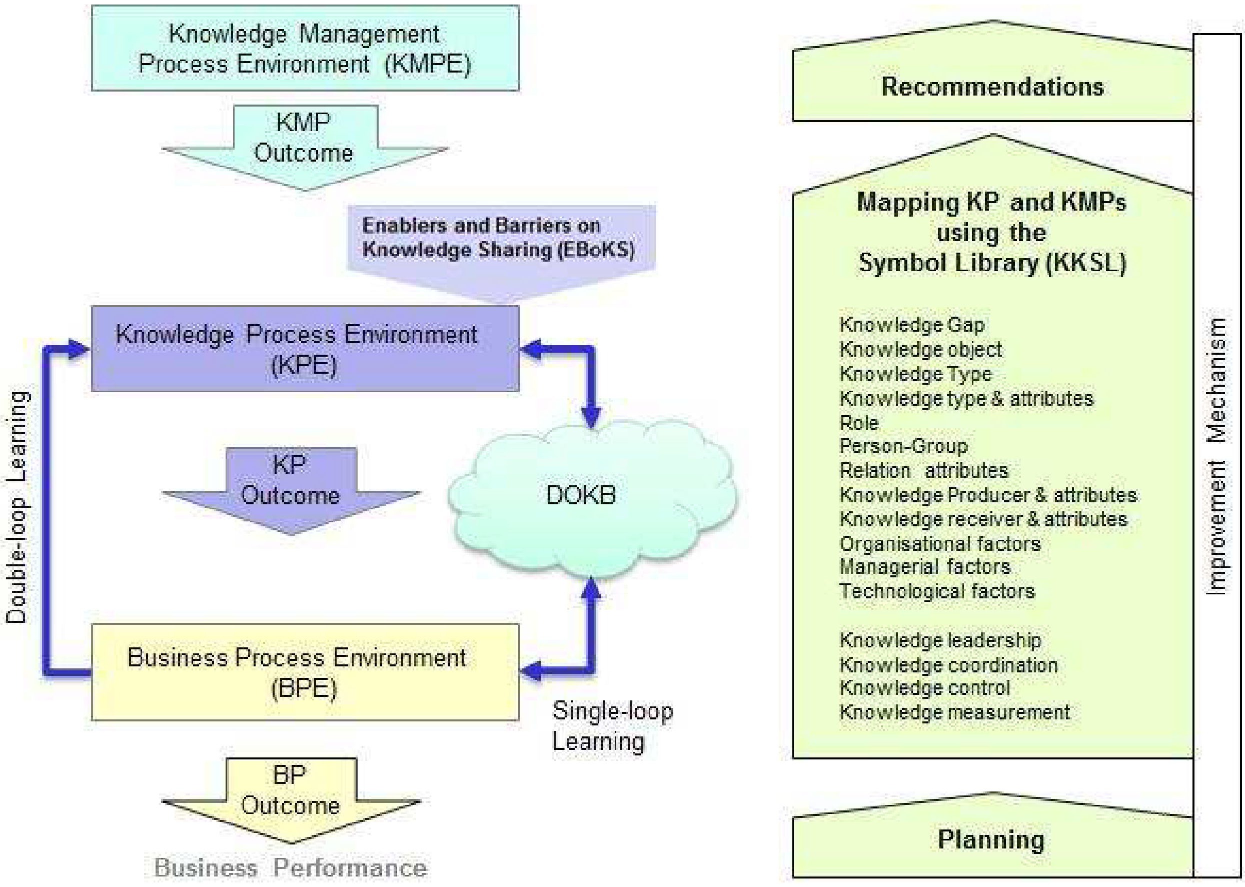
9.1.5 Recommend Guidelines for Implementation of the Solution

Finally, this objective was dealt with in Chapter 7 where the lessons learned from implementing the KBBPI framework were formulated as recommendations and a guideline for a successful implementation of the KBBPI framework are suggested. The given recommendations include preconditions, facilitator selection, training and project management.

9.2 The Resulting Framework

The combination of findings, theory and practice (implementation) led to the proposal for a KBBPI framework that is filling the identified gap in the field of KM and BPI. *The Figure below is identical to Figure 41 and included here in order to highlight the final outcome from the research.*

Figure 42. The Final KBBPI Framework (repeated)


Knowledge Management Process Environment (KMPE)
KMP Outcome
Enablers and Barriers on Knowledge Sharing (EBoKS)
Knowledge Process Environment (KPE)
Double-loop Learning
KP Outcome
DOKB
Business Process Environment (BPE)
Single-loop Learning
BP Outcome
Business Performance
Recommendations
Mapping KP and KMPs using the Symbol Library (KKSL)
Knowledge Gap
Knowledge object
Knowledge Type
Knowledge type & attributes
Role
Person-Group
Relation attributes
Knowledge Producer & attributes
Knowledge receiver & attributes
Organisational factors
Managerial factors
Technological factors
Knowledge leadership
Knowledge coordination
Knowledge control
Knowledge measurement
Planning
Improvement Mechanism

9.3 Contributions of this Research

The discussion of contributions includes how the findings from research contribute to the theory in the field and to business practice.

9.3.1 Contributions to Theory

This research applied various theories from KM and BP to the context of knowledge-based business process improvement. Conceptualising and empirically evaluating these considerations (the KBBBPI framework), the study complements and extends the existing body of research in two ways:

- Understanding of KM and BPI.
- Concept of the KBBPI framework.

The first is the contribution to theory by filling the research gap identified by introducing a new framework that advances the understanding of the link between KM and BPI. This highlighted a number of under-explored mechanisms for improving knowledge-intensive businesses through KM.

The second contribution to theory is the KBBPI framework and includes the incorporation of the several different elements from theory into one framework, the KBBPI framework (Figure 42). The combination of these elements into one single cohesive framework is, by reference to the published literature, distinctive.

The second contribution to theory not only includes the incorporation of elements from theory into one single cohesive framework but also their further development and confirmation.

As discussed in 9.1.2 above, a second contribution to theory is the extension of DBR methodology by making it more robust (see Section 3.4.2). The contribution to theory is the developed methodology, a single case DBR methodology using action research because such a methodology is, to the best of researcher's knowledge, distinguishable from all other DBR methodologies. This methodology can be a useful way to create business knowledge that is both relevant and rigorous.

9.3.2 Contributions to Practice

Besides its theoretical contributions, this research makes contributions to business practice. The key points are:

a) An implementable framework [with guidelines for use], not just a theory.

b) An effective framework; the evaluation case and the validation panel reported material benefit from its use.

These two key points include the following detailed considerations:

A further contribution to practice is linking findings from theory to daily work. In this context, one can argue that applied methodology in the case is of interest for practitioners and, thus, a contribution to practice. The applied DBR methodology for implementation and evaluation of a framework can be of interest for other organisations and researchers. Therefore, the KBBPI framework can serve as a practical "Dos and Don'ts" guide. Although not prescriptive in content, the model can nevertheless act as a road map for implementation. In this sense, a contribution to practice is to offer the guidelines to practitioners in the form of a well-founded framework for KM initiatives.

A further contribution, as confirmed from the case (see Chapters 7 and 8) is that the implementation of the KBBPI framework creates KM awareness on all levels of the organisation; thus, the KBBPI framework can be applied as a tool that helps to create KM awareness in organisations. The KBBPI framework also turns over stones to some extent and reveals weaknesses and problems. Finally, the KBBPI framework extends the set of available tools for consultants in the field of BP and KM.

9.4 Further Research

Reflecting on the research outcomes, directions for potential further research can be identified.

9.4.1 Generalisability-Transferability

As discussed (in Section 3.9.2), this research approach is conducted in the context of a unique situation, leading to a single case study approach. One can summarise that potential transferability was accomplished in this research by adopting purposeful sampling and using an information-rich case study in which the researcher collects sufficiently detailed descriptions of the data to allow judgements about transferability. However, in order to increase the generalisability of results from this research, there is an opportunity to test the KBBPI framework in other types of knowledge-intensive businesses.

9.4.2 Other Opportunities

The finding emerged that other kinds of knowledge gaps might exist in BPs. Further research could investigate the taxonomies of knowledge gaps in BPs and thus confirm whether or not different types of knowledge gap exist and how they relate to the performance of BPs. During implementation of the KBBPI framework, it was clear that cost-benefit was a sensitive issue in the case company. This issue concerns the link between KM implementation and performance outcomes (Choy, 2006). The design and selection of quantitative performance measures, such as process benchmarks or financial results, and their use to assess the value of the KBBPI framework, could be a profitable direction of research. The focus would be to seek the direct relationship between improvement of knowledge activities and organisational performance.

9.5 Personal Reflection on this Research

Marquardt (1999) points out that, as part of the reflection process of action research, both the task action and the personal learning have equal weight and importance. Therefore, action researchers are expected to indicate a response to "*What have I personally learned from doing this research"?*

The researcher feels that he has learned new skills by doing doctoral research, such as critical thinking and problem solving, but also some added pedagogical and group skills. Probably, the most important lesson learned was the need to have a clear and steady goal in starting a research project. The project had a greater impact on my time and life circumstances than anticipated and combining full time work and study commitments was challenging. The research has helped the researcher to recognise the complexity of professional practice and that the way forward is to become a reflective practitioner by constantly researching that practice (Schön, 1983).

9.6 Final Statement

An effective framework for knowledge-based diagnosis and improvement planning of business processes has been successfully produced, bridging a gap in the research domain. This KBBPI framework provides a means of improving knowledge-intensive businesses through KM.

The KBBPI framework represents an appropriate theory for designing KM support for knowledge-intensive business processes and the guidelines (Section 7.4) describe the context in which the framework is applicable.

This research calls for further research in the area of testing the KBBPI framework in other types of knowledge-intensive businesses and quantitative performance measures to assess the value of the KBBPI framework.

- This research can stimulate and trigger future research in the field of KM and BPI, especially of knowledge-based BPI to increase the ability of knowledge-intensive organisations to deal with KM.

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Appendix A

Interview Guide in Redesign

The PowerPoint presentation, which provided structure to the interview, is shown below. Furthermore, the researcher prepared handwritten notes consisting of background information about the researcher and the research and two ‘bottom-line’ questions, asked at the end of the presentation. These are “How do you perceive the initial KBBPI framework?” and “How could the initial KBBPI framework be improved?”

Wissensorienterte Prozessverbesserung

Vorinformationen

Persönliche Ausgangslage

Doktorarbeit

Fragestellung: wissensorientierte Prozessoptimiering

Konkrete Ansätze: →Projektdurchführung in einem Beratungsunternehmen

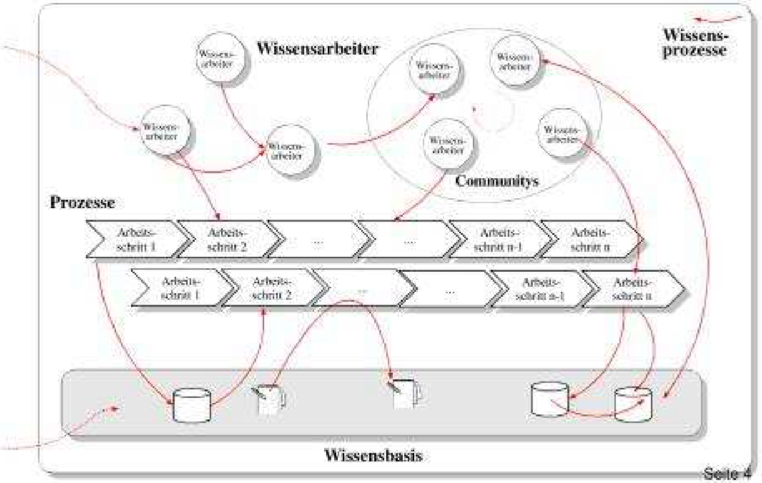
Zielsetzung: Rückmeldungen zu erhalten betreffend des Ansatzes!

Praktische Ausgangslage

Problemstellung:

1. Wissen ist nicht zu rechten Zeit am rechten Ort...
2. Mangelndes Wissen über Kunden und ihre Wünsche...
3. Mangelnde Wissensgenerierung...
4. Unternehmen verlieren Wissen, wenn Mitarbeiter das Unternehmen verlassen...
5. Wissen wird innerhalb des Unternehmens nur unzureichend weitergegeben...

Theoretischer Lösungsansatz 1


Wissensarbeiter
Wissens-arbeiter
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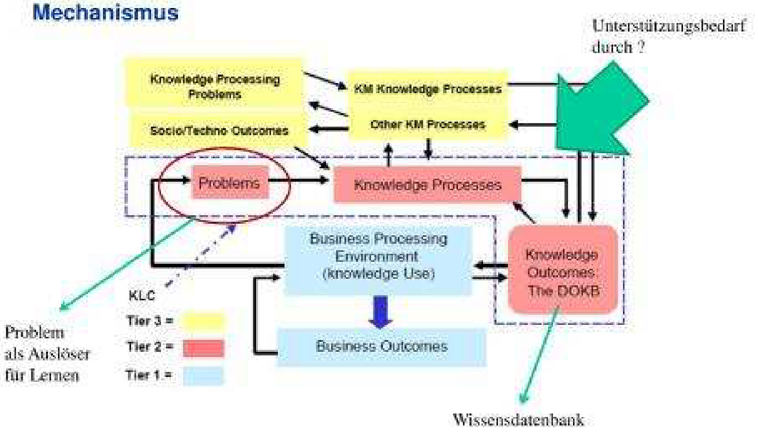
Wissens-arbeiter
Wissens-arbeiter
Wissens-arbeiter
Wissens-arbeiter
Communitys
Wissens-prozesse
Prozesse
Arbeits-schritt 1
Arbeits-schritt 2
...
...
Arbeits-schritt n-1
Arbeits-schritt n
Arbeits-schritt 1
Arbeits-schritt 2
...
...
Arbeits-schritt n-1
Arbeits-schritt n
Wissensbasis

Theoretischer Lösungsansatz 1

Unterscheidung von 3 Ebenen!

1. Erfassung und Abbildung bestehender Geschäftsprozesse
2. Erfassung und Abbildung der Wissensprozesse sowie Analyse von:
   a) Wissenstypen
   b) Wissensattributen
3. Erfassung und Abbildung der Wissensmanagementprozesse

Mechanismus


Unterstützungsbedarf durch ?
Knowledge Processing Problems
KM Knowledge Processes
Socio/Techno Outcomes
Other KM Processes
Problems
Knowledge Processes
Business Processing Environment (knowledge Use)
Knowledge Outcomes: The DOKB
Business Outcomes
KLC
Tier 3 =
Tier 2 =
Tier 1 =
Problem als Auslöser für Lernen
Wissensdatenbank

Grundlagen des Modells 1

Wissen:

- Problemorientiert
- Wissen wird als Problemlösungkompetenz definiert
  - Kompetenz von Menschen
  - Informationen in jeder Art von Dokumenten

Grundlagen des Modells 2

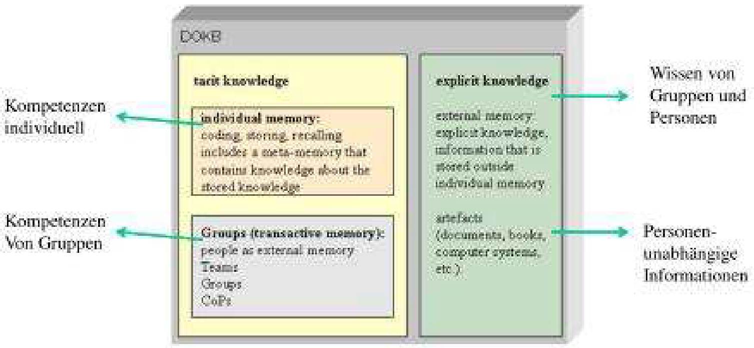
Wissensarten:

- Individuelle Kompetenz:
  Conscious, (explicit knowledge held by the individual)
- Gruppen Kompetenz:
  Objectified, (explicit knowledge held by the organisation)
- Individuelles Wissen
  Automatic, (preconscious individual tacit knowledge)
- Gruppenwissen
  Collective, (collective tacit knowledge, highly context-dependent knowledge which is manifested in the practice of an organisation)

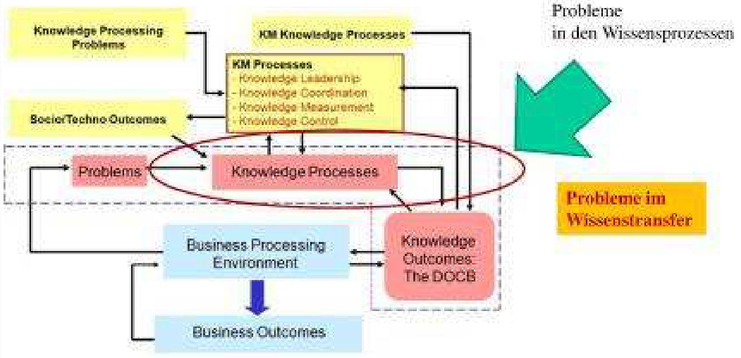
→ Diese Wissensarten sind in der DOKB gespeichert!

Grundlagen des Modells 3

Wissensarten in der DOKB:


DOKB
tacit knowledge
individual memory:
coding, storing, recalling
includes a meta-memory that contains knowledge about the stored knowledge
Groups (transactive memory):
people as external memory
Teams
Groups
CoPs
explicit knowledge
external memory:
explicit knowledge, information that is stored outside individual memory
artefacts
(documents, books, computer systems, etc.)
Kompetenzen individuell
Kompetenzen Von Gruppen
Wissen von Gruppen und Personen
Personen-unabhängige Informationen

Mechanismus


Knowledge Processing Problems
KM Knowledge Processes
KM Processes
- Knowledge Leadership
- Knowledge Coordination
- Knowledge Measurement
- Knowledge Control
Socio/Techno Outcomes
Problems
Knowledge Processes
Business Processing Environment
Knowledge Outcomes: The DOCB
Business Outcomes
Probleme in den Wissensprozessen
Probleme im Wissenstransfer

Einflussfaktoren Wissenstransfer

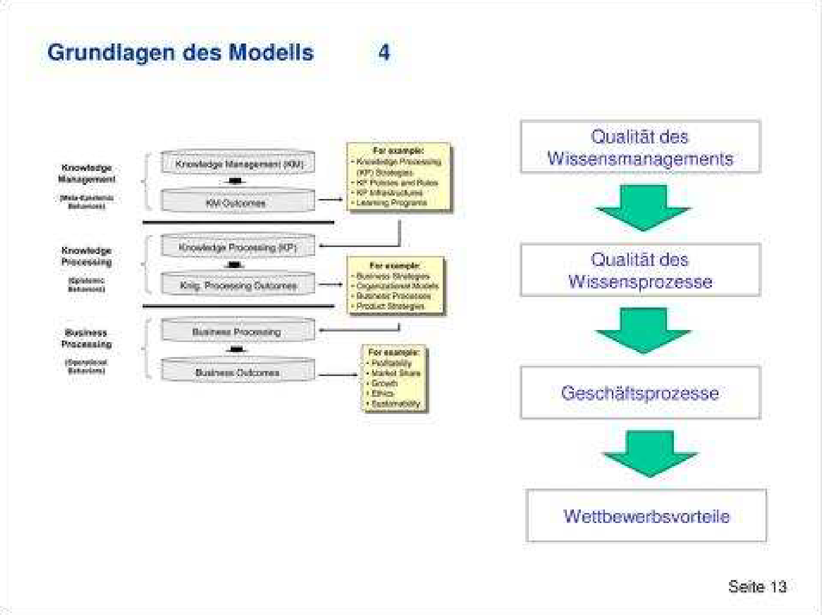
Knowledge per se	Knowledge producer	Knowledge recipient	Relationship producer-recipient	Context

Probleme im Wissenstransfer

Einflussfaktoren Wissenstransfer

Attribute von:

Wissen	W-Besitzer	W-Empfänger	Q-Beziehung	Kontext
- "taciteness" - Komplexität (individual vs. collective; level of distribution) - W-Qualität (Zuverlässigkeit, Konsistenz)	- Motivation - Zuverlässigkeit - Verständnis für Bedarf	-Bedarfsbewusstsein -Aufnahmekapazität	- sozial Orientierung - Autoritätsgläubigkeit - Gleichwertigkeitsempfinden - Ökonomische Interessen	- Organisation - Führung - ICT



Grundlagen des Modells 4

Knowledge Management
(Meta-Epistemic Behaviors)
Knowledge Management (KM)
KM Outcomes
For example:
• Knowledge Processing (KP) Strategies
• KP Policies and Rules
• KP Infrastructures
• Learning Programs
Knowledge Processing
(Epistemic Behaviors)
Knowledge Processing (KP)
Knlg. Processing Outcomes
For example:
• Business Strategies
• Organizational Models
• Business Processes
• Product Strategies
Business Processing
(Operational Behaviors)
Business Processing
Business Outcomes
For example:
• Profitability
• Market Share
• Growth
• Ethics
• Sustainability

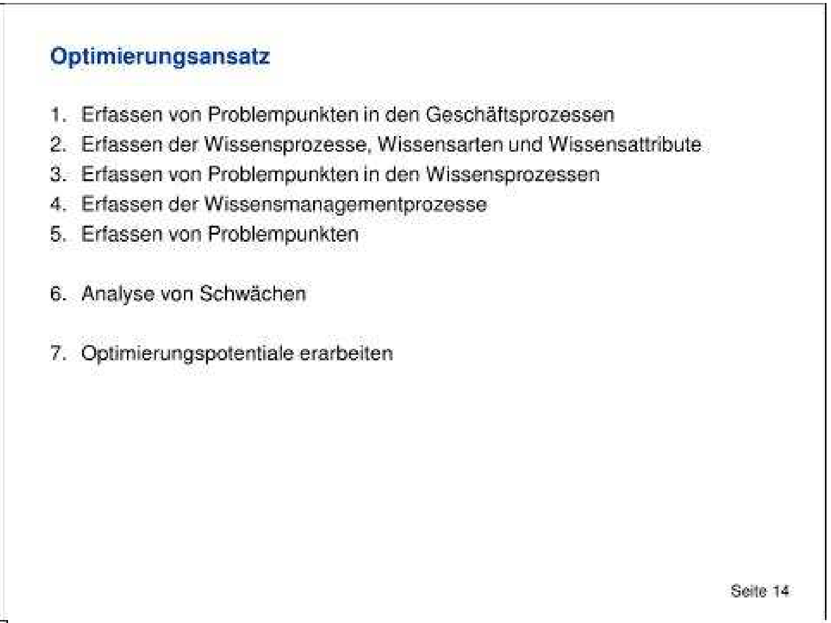
Qualität des Wissensmanagements

Qualität des Wissensprozesse

Geschäftsprozesse

Wettbewerbsvorteile

Seite 13



Optimierungsansatz

1. Erfassen von Problempunkten in den Geschäftsprozessen
2. Erfassen der Wissensprozesse, Wissensarten und Wissensattribute
3. Erfassen von Problempunkten in den Wissensprozessen
4. Erfassen der Wissensmanagementprozesse
5. Erfassen von Problempunkten

6. Analyse von Schwächen

7. Optimierungspotentiale erarbeiten

Seite 14

Fragen & Rückmeldungen?

Seite 15

Appendix B

Example of an Interview Transcript in Redesign

Following each interview, the researcher sought to reflect on what happened and what was learned. Furthermore, in addition to the transcripts, the researcher made notes based on observations, including the participants' behaviour and contextual aspects. This was done as soon as possible after each interview. The researcher sent a copy of the interview transcripts to the interviewees a few days later and asked them to validate them. At the end of the interviews, the researcher had five transcripts from the individual interviews, an example of which is given below.

Wissensorienterte Prozessverbesserung
Teilnehmer: RK / Datum: 12.5.06
Bemerkungen zum Interview: nichts besonderes, erscheint sehr motiviert zu helfen

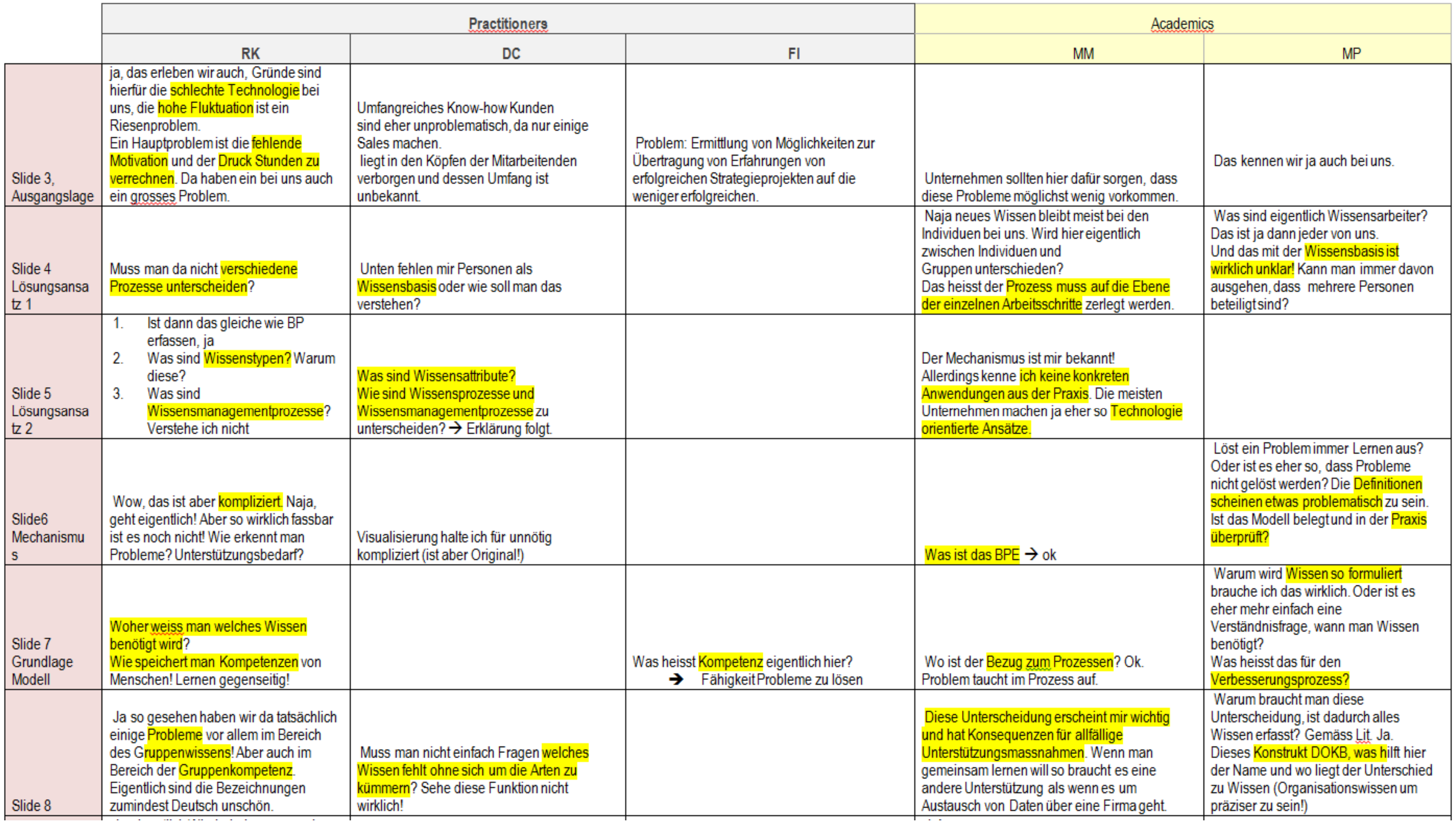
F3	Ja, das erleben wir auch, Gründe sind hierfür die schlechte Technologie bei uns, die hohe Fluktuation ist ein Riesenproblem. Ein Hauptproblem ist die fehlende Motivation und der Druck Stunden zu verrechnen. Da haben ein bei uns auch ein grosses problem.
F4	Muss man da nicht verschiedene Prozesse unterscheiden? NII: Ja, jeder Prozess muss einzeln erfasst werden
F5	1. Ist dann das gleiche wie BP erfassen, ja NII: ja, genau das. 2. Was sind Wissenstypen? Warum diese? NII: Unterscheidung explizit, implizit, individuell und Gruppe 3. Was sind Wissensmanagementprozesse? Verstehe ich nicht NII: das sind Prozesse, welche Wissensprozesse steuern, dazu kommen wir noch später..
F6	Wow, das ist aber kompliziert. NII: nein, eigentlich geht es nur um die Aussage, Probleme verursachen Wissenslücken und diese wiederum Lerneffekte. Dieser Mechanismus löst Lernprozesse aus und diese kann man wiederum unterstützen durch die KMPs. Naja, geht eigentlich! Aber so wirklich fassbar ist es noch nicht! Wie erkennt man Probleme? NII: Man fragt die Personen im Prozess! Unterstützungsbedarf? NII: Das heisst durchs Management, zum Beispiel ich bekomme Zeit gutgeschrieben, wenn ich Wissen teile!
F7	Woher weiss man welches Wissen benötigt wird? NII: Man fragt die Personen im Prozess! Wie speichert man Kompetenzen von Menschen! Lernen gegenseitig! NII: Man hilft, dass die Personen voneinander lernen können!
F8	Ja so gesehen haben wir da tatsächlich einige Probleme vor allem im Bereich des Gruppenwissens! Aber auch im Bereich der Gruppenkompetenz. Eigentlich sind die Bezeichnungen zumindest Deutsch unschön.
F9	Ja eigentlich Wiederholung von vorher, aber die Grundidee scheint klar zu sein. Wenn ich es richtig verstehe so heisst es, dass jemand im Unternehmen schaut, wo welche Wissensarten benötigt werden und diese danach versucht einerseits zur Verfügung zu stellen aber anderseits auch dafür sorgt, dass diese wieder irgendwo gespeichert werden! Ist das so? NII: ja, genau das.
F10	Ja genau und hier sieht man dann die Managementaktivitäten. Bin allerdings unsicher, ob dies wirklich nur für sind! NII: laut Modell von Holsapple wäre es so. Naja wenn, die Literatur das sagt so wird es wohl so sein!

F11 /F12	Ok, das sind die Einflussgrössen! Aber wie beeinflusse ich die Person mit Wissen, dass sie es weitergibt? Durch Geld? Oder durch was? NII: Da gibt es verschieden Faktoren, zum Beispiel Informationsweitergabe kann man durch Geld motivieren, aber gemeinsames Lernen/Zusammenarbeiten ist eher eine Kulturfrage. Kultur! Naja, aber die Kultur ändert man nicht einfach so schnell mal! Was mach man wenn keine Beziehung besteht? NII: dann ist die Einflussgrösse: keine Beziehung
F13	Das heisst, wenn man Km verbessert so kann man auch die KPs verbessern und dadurch den Prozess, ja das scheint logisch
F14	Danach erfasst man die zu den Problempunkt entsprechend die Art des benötigten Wissens und die Wissensprozesse mit all den zugehörigen Attributen. Ok. Die ergeben in Summe die Schwächen? NII: Ja und nein Teilweise beziehen sich die Schwächen auf Managementprozesse.
Frage: Was halten Sie von dem Ansatz?	Scheint eine gute Idee zu sein aber auch ein Riesenaufwand? Wird schwierig werden eine Firma zu finden die dies macht!
Frage: Was muss man verbessern?	Was wirklich noch fehlt ist eine Idee wie man die Sache umsetzen könnte! Ebenfalls die Verknüpfung mit der Wissensstrategie des Unternehmens. Zum Beispiel bei uns passt die Organisation nicht zur Idee. NII: Was heisst das? Unsere Organisation unterstützt schon von sich aus keinen Wissensaustausch. NII: Dann wäre es ja gerade doch etwas für den Ansatz, weil die Organisation kann man ja ändern!

Appendix C

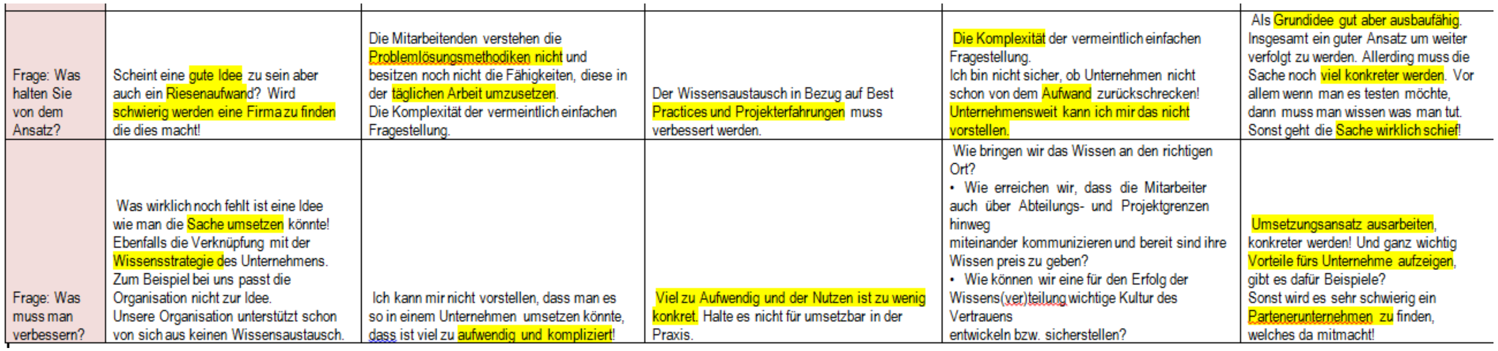
Example of the Analysis in Redesign

The data analysis started with breaking down the text from the individual interviews into numbered segments. The numbering was linked to the slides and the questions used in the presentation; as the analysis progressed, the focus was put on the individual questions. The result was summarised in an Excel spreadsheet, which is shown below.



	Practitioners			Academics	
	RK	DC	FI	MM	MP
Slide 3, Ausgangslage	ja, das erleben wir auch, Gründe sind hierfür die schlechte Technologie bei uns, die hohe Fluktuation ist ein Riesenproblem. Ein Hauptproblem ist die fehlende Motivation und der Druck Stunden zu verrechnen. Da haben ein bei uns auch ein grosses Problem.	Umfangreiches Know-how Kunden sind eher unproblematisch, da nur einige Sales machen. liegt in den Köpfen der Mitarbeitenden verborgen und dessen Umfang ist unbekannt.	Problem: Ermittlung von Möglichkeiten zur Übertragung von Erfahrungen von erfolgreichen Strategieprojekten auf die weniger erfolgreichen.	Unternehmen sollten hier dafür sorgen, dass diese Probleme möglichst wenig vorkommen.	Das kennen wir ja auch bei uns.
Slide 4 Lösungsansatz 1	Muss man da nicht verschiedene Prozesse unterscheiden?	Unten fehlen mir Personen als Wissensbasis oder wie soll man das verstehen?		Naja neues Wissen bleibt meist bei den Individuen bei uns. Wird hier eigentlich zwischen Individuen und Gruppen unterschieden? Das heisst der Prozess muss auf die Ebene der einzelnen Arbeitsschritte zerlegt werden.	Was sind eigentlich Wissensarbeiter? Das ist ja dann jeder von uns. Und das mit der Wissensbasis ist wirklich unklar! Kann man immer davon ausgehen, dass mehrere Personen beteiligt sind?
Slide 5 Lösungsansatz 2	1. Ist dann das gleiche wie BP erfassen, ja 2. Was sind Wissenstypen? Warum diese? 3. Was sind Wissensmanagementprozesse? Verstehe ich nicht	Was sind Wissensattribute? Wie sind Wissensprozesse und Wissensmanagementprozesse zu unterscheiden? → Erklärung folgt.		Der Mechanismus ist mir bekannt! Allerdings kenne ich keine konkreten Anwendungen aus der Praxis. Die meisten Unternehmen machen ja eher so Technologie orientierte Ansätze.	
Slide6 Mechanismus	Wow, das ist aber kompliziert. Naja, geht eigentlich! Aber so wirklich fassbar ist es noch nicht! Wie erkennt man Probleme? Unterstützungsbedarf?	Visualisierung halte ich für unnötig kompliziert (ist aber Original!)		Was ist das BPE → ok	Löst ein Problem immer Lernen aus? Oder ist es eher so, dass Probleme nicht gelöst werden? Die Definitionen scheinen etwas problematisch zu sein. Ist das Modell belegt und in der Praxis überprüft?
Slide 7 Grundlage Modell	Woher weiss man welches Wissen benötigt wird? Wie speichert man Kompetenzen von Menschen! Lernen gegenseitig!		Was heisst Kompetenz eigentlich hier? → Fähigkeit Probleme zu lösen	Wo ist der Bezug zum Prozessen? Ok. Problem taucht im Prozess auf.	Warum wird Wissen so formuliert brauche ich das wirklich. Oder ist es eher mehr einfach eine Verständnisfrage, wann man Wissen benötigt? Was heisst das für den Verbesserungsprozess?
Slide 8	Ja so gesehen haben wir da tatsächlich einige Probleme vor allem im Bereich des Gruppenwissens! Aber auch im Bereich der Gruppenkompetenz. Eigentlich sind die Bezeichnungen zumindest Deutsch unschön.	Muss man nicht einfach Fragen welches Wissen fehlt ohne sich um die Arten zu kümmern? Sehe diese Funktion nicht wirklich!		Diese Unterscheidung erscheint mir wichtig und hat Konsequenzen für allfällige Unterstützungsmassnahmen. Wenn man gemeinsam lernen will so braucht es eine andere Unterstützung als wenn es um Austausch von Daten über eine Firma geht.	Warum braucht man diese Unterscheidung, ist dadurch alles Wissen erfasst? Gemäss Lit. Ja. Dieses Konstrukt DOKB, was hilft hier der Name und wo liegt der Unterschied zu Wissen (Organisationswissen um präziser zu sein!)

Slide 9	Ja eigentlich Wiederholung von vorher, aber die Grundidee scheint klar zu sein. Wenn ich es richtig verstehe so heisst es, dass jemand im Unternehmen schaut, wo welche Wissensarten benötigt werden und diese danach versucht einerseits zur Verfügung zu stellen aber anderseits auch dafür sorgt, dass diese wieder irgendwo gespeichert werden! Ist das so?			Ja! Dann bräuchte es aber jemanden, der die ganze Sache im Unternehmen überwacht und diese Person haben wir nicht! Wäre das der CKO?	Ist gleicher Inhalt wie Folie wie 8 nur andere Namen.
Slide 10	Ja genau und hier sieht man dann die Managementaktivitäten. Bin allerdings unsicher, ob dies wirklich nur für sind! Naja wenn, die Literatur das sagt so wird es wohl so sein!	Sind die Begriffe Führung usw. allgemein zu verstehen oder spezifisch auf WM (KM)? Was heisst es konkret, wenn man Führung auf WM bezieht? Zum Beispiel ich teile bewusst mein Wissen und sorge dafür, dass andere erkennen, dass ich mich so benehme im Unternehmen oder?	Was ist der Unterschied zur Folie 6?	Ok, der Mechanismus schein mir nun wirklich nachvollziehbar zu sein!	Wer sagt dass es 4 Aktivitäten sind, ok-Lit. Was ist der Unterschied Problem in Wissensprozessen und Probleme in Wissenstransfer?
Slide 11 / 12	Ok, das sind die Einflussgrössen! Aber wie beeinflusse ich die Person mit Wissen, dass sie es weitergibt? Durch Geld? Oder durch was? Kultur! Naja, aber die Kultur ändert man nicht einfach so schnell mal! Was mach man wenn keine Beziehung besteht?	Was macht man nun mit diesen, ok Ja, aber ein Riesenaufwand!		Die Frage die die sich stellt ob der Kontext nicht alle anderen Faktoren beeinflusst?	Woher kommen diese Einflussfaktoren? Ist die Liste vollständig? Was ist der Zweck?
Slide 13	Das heisst, wenn man Km verbessert so kann man auch die KPs verbessern und dadurch den Prozess, ja das scheint logisch		Können nicht alle Folien auf Deutsche sein? Ist etwas mühsam!	Ausserdem scheint es, dass es Beziehungen zwischen den einzelnen Faktoren zu geben scheint! Oder nicht! Das wäre spannend hier mehr zu sehen	Ist das nicht das Gleiche wie Slide 5? Auch scheint mir die Trennung nicht so eindeutig, zwischen BPs und KPs, die Unterscheidung dürfte nicht immer wirklich klar sein! Zum Beispiel an einer Hochschule!
Slide 14	Danach erfasst man die zu den Problempunkt entsprechend die Art des benötigten Wissens und die Wissensprozesse mit all den zugehörigen Attributen. Ok. Die ergeben in Summe die Schwächen? Ja und nein → teilweise beziehen sich die Schwächen auf Managementprozesse.	Der Mechanismus scheint klar zu sein.	Und das soll man im Unternehmen machen über alle Prozesse hinweg? Unglaublicher Aufwand!	Wie erfasse ich die Problempunkte? Ok, das heisst man muss alle Prozesse detailliert aufnehmen! Ein riesen Aufwand wenn es nicht schon bereits gemacht ist.	Kann ich mir für gewisse sehr kritische Prozesse als sinnvoll vorstellen, aber allgemein dürfte sehr schwierig werden!



Frage: Was halten Sie von dem Ansatz?	Scheint eine gute Idee zu sein aber auch ein Riesenaufwand? Wird schwierig werden eine Firma zu finden die dies macht!	Die Mitarbeitenden verstehen die Problemlösungsmethodiken nicht und besitzen noch nicht die Fähigkeiten, diese in der täglichen Arbeit umzusetzen. Die Komplexität der vermeintlich einfachen Fragestellung.	Der Wissensaustausch in Bezug auf Best Practices und Projekterfahrungen muss verbessert werden.	Die Komplexität der vermeintlich einfachen Fragestellung. Ich bin nicht sicher, ob Unternehmen nicht schon von dem Aufwand zurückschrecken! Unternehmensweit kann ich mir das nicht vorstellen.	Als Grundidee gut aber ausbaufähig. Insgesamt ein guter Ansatz um weiter verfolgt zu werden. Allerding muss die Sache noch viel konkreter werden. Vor allem wenn man es testen möchte, dann muss man wissen was man tut. Sonst geht die Sache wirklich schief!
Frage: Was muss man verbessern?	Was wirklich noch fehlt ist eine Idee wie man die Sache umsetzen könnte! Ebenfalls die Verknüpfung mit der Wissensstrategie des Unternehmens. Zum Beispiel bei uns passt die Organisation nicht zur Idee. Unsere Organisation unterstützt schon von sich aus keinen Wissensaustausch.	Ich kann mir nicht vorstellen, dass man es so in einem Unternehmen umsetzen könnte, dass ist viel zu aufwendig und kompliziert!	Viel zu Aufwendig und der Nutzen ist zu wenig konkret. Halte es nicht für umsetzbar in der Praxis.	Wie bringen wir das Wissen an den richtigen Ort? • Wie erreichen wir, dass die Mitarbeiter auch über Abteilungs- und Projektgrenzen hinweg miteinander kommunizieren und bereit sind ihre Wissen preis zu geben? • Wie können wir eine für den Erfolg der Wissens(ver)teilung wichtige Kultur des Vertrauens entwickeln bzw. sicherstellen?	Umsetzungsansatz ausarbeiten, konkreter werden! Und ganz wichtig Vorteile fürs Unternehme aufzeigen, gibt es dafür Beispiele? Sonst wird es sehr schwierig ein Partenerunternehmen zu finden, welches da mitmacht!

Appendix D

Topic Guide for the Focus Group in Redesign

The topic guide included a short list of questions derived from the findings from the prior interview (see Table 15) and served as an agenda for the focus group. This included validation of the findings from the interviews and confirmation of the completeness of findings in relation to the interview questions. This was followed by identifying themes, patterns and connections before summarising them and it is shown below.

Wissensorienterte Prozessverbesserung / Zusammenfassung und Kategorisierung

Teilnehmer: RK/DC/FI/MM/MP

F3	Bestätigung des Problems: schlechte Technologie hohe Fluktuation fehlende Motivation Druck Stunden zu verrechnen
F4	Unklare Definitionen und Verständnis: verschiedene Prozesse unterscheiden Prozess muss auf die Ebene der einzelnen Arbeitsschritte Wissensbasis
F5	Unklare Definitionen und Verständnis: Wissenstypen? Wissensmanagementprozesse? Was sind Wissensattribute? Wie sind Wissensprozesse und Wissensmanagementprozesse Praxisbezug ich keine konkreten Anwendungen aus der Praxis Technologie orientierte Ansätze.
F6	Komplex Komplizier Praxisbezug Praxis überprüft? Unklare Definitionen und Verständnis Definitionen scheinen etwas problematisch
F7	Unklare Definitionen und Verständnis Woher weiss man welches Wissen benötigt wird? Wie speichert man Kompetenzen
F8	Unklare Definitionen und Verständnis Konstrukt DOKB Bestätigung Probleme Gruppenwissens! Gruppenkompetenz. Diese Unterscheidung erscheint mir wichtig und hat Konsequenzen für allfällige Unterstützungsmassnahmen Zweifel an Notwendigkeit: welches Wissen fehlt ohne sich um die Arten zu kümmern
F9	Bestätigung Grundidee scheint klar Neu Idee CKO
F10	Bestätigung Ja genau und hier sieht man dann die Managementaktivitäten Mechanismus schein mir nun wirklich nachvollziehbar Unklare Definitionen und Verständnis Führung usw. allgemein zu verstehen oder spezifisch auf WM (KM)? Was heisst es konkret, wenn man Führung auf WM bezieht? Was ist der Unterschied Problem in Wissensprozessen und Probleme in Wissenstransfer
F11 /F12	Unklare Definitionen und Verständnis die Einflussgrössen Aufwand Riesenaufwand
F13	Bestätigung Das heisst, wenn man Km verbessert so kann man auch die KPs verbessern und dadurch den Prozess, ja das scheint logisch Unklare Definitionen und Verständnis Einflussgrössen Neu Idee Ausserdem scheint es, dass es Beziehungen zwischen den einzelnen Faktoren zu geben scheint!
F14	Aufwand Ok. Die ergeben in Summe die Schwächen, sehr kritische Prozesse als sinnvoll vorstellen Bestätigung Ok. Die ergeben in Summe die Schwächen; Mechanismus scheint klar

Frage: Was halten Sie von dem Ansatz?	Komplex Riesenaufwand? Idee gute Idee Schwierig umsetzbar Wird schwierig werden eine Firma zu finden die dies macht!, Mitarbeitenden verstehen die Problemlösungsmethodiken, Practices und Projekterfahrungen;
Frage: Was muss man verbessern?	Umsetzungsmethodologie Sache umsetzen; Keine Erfahrungen Vorteile fürs Unternehme aufzeigen, Aufwand Nutzen aufwendig und kompliziert Partnerunternehmen finden Partenerunternehmen zu finden Verknüpfung mit anderen Themen Wissensstrategie d

Appendix E

Transcript of the Focus Group in Redesign

The focus group facilitated feedback on what the participants thought about the results from the interviews, with further reflection on the KBBPI framework and views on how to improve it. Sampling was not an issue at this stage because all five participants from interviews agreed to participate in the focus group session.

The topic guide (Appendix D) included a short list of questions derived from the findings from the prior interviews (see Table 15) and served as an agenda for the focus group. This included validation of the findings from the interviews.

Wissensorienterte Prozessverbesserung / Focus Group	
Teilnehmer: RK/DC/FI/MM/MP	
Sind es die Probleme, die Sie meinten?	RK,MM,MP: Ja insgesamt ja. MM: Allerdings ist es schwierig zu sagen wie relevant diese Probleme sind. Bezogen auf das Model sehe ich nur die Schwierigkeit, dass es schwierig wird ein Unternehmen zu finden das mitmacht. FI: Ich denke das wird unmöglich ein Unternehmen zu finden. Vor allem, das über eine lange Zeit hinweg bei der ganzen Geschichte bleibt. Das würde ja heissen, alle BP aufzunehmen und zu analysieren und zwar auf der Ebene der einzelnen Arbeitsschritte. DC: das sehe ich nicht unbedingt so, man kann ja einzelne Prozesse nehmen und diese optimieren, wo es eben Schwächen gibt, die man kennt. Nii: ich denke die Diskussion geht jetzt in die Umsetzung. Können wir nicht zuerst schauen, ob die Resultate vollständig sind. RK: Ich denke das haben wir schon bestätigt.
Grundproblem ist relevant für wissensintensive Firmen	MP: Ja, das Grundproblem sehe ich als gegeben Allerdings ist unklar ob das Model zur Lösung was beiträgt. Nii: bleiben wir mal beim Problem, ob es eine Lösung liefert zeigt sich allenfalls später. Fi,MM: Ich denke das Grundproblem, kennen wir alles aus unserer Arbeit. Wir kennen alle die Situation, dass uns Informationen fehlen oder wir von jemanden etwas wissen möchten und kommen an dies Informationen nicht ran. RK: Ja und vor allem bei uns ist es die geringe Bereitschaft Wissen zu teilen, aus Mangel an Zeit aber auch aus dem Grund, dass man sich gegenüber Kollegen eine Vorteil verschafft. MM: Das ist in der Beratung allgemein so, jeder Berater hat seine Kompetenzen und machte diesen Vorteil nicht verlieren. Das dürfte bei allen wissensintensiven Arbeiten so sein. MP: ob das wirklich im Sinne des Unternehmens ist? Nii: wir sollten vielleicht noch die anderen Problembereiche anschauen.
Es handelt sich um eine potentiell erfolgreiche Vorgehensweise (gute Idee)	MM: ja die Idee halte ich für überzeugend. Aber der Aufwand und Nutzen scheint mir sehr fraglich. RK: soweit ich sehe ist niemand der Meinung, dass die Idee schlecht wäre. Nii: stammt ja auch nicht von mir, sondern von anderen. MP: Hat man das Modell schon mal in der Praxis getestet? Nii: Ja es gibt den Ansatz des prozessorientierten WM und da wurde schon einiges gemacht, vor allem in Österreich. MP: Kannst Du mir was dazu schicken?
Grundprinzip des Ansatzes ist nachvollziehbar	RK: Ich denke das wurde bereits bestätigt.
Das '3-Stufen Model' überzeugt	MP: Mir ist die Unterscheidung zwischen den Prozesstypen noch immer nicht ganz klar. Wie ist es in zum Beispiel bei uns, das Wissen ist ja Hauptprodukt unserer Prozesse: Nii: ja schon, darum geht es nicht! Es geht darum, dass wenn eine Lektion vorbereitet wird und mir fehlt Wissen über etwas, man suchen muss. Das Suchen ist dann entsprechend ein Wissensprozess, welche mit dem eigentlich BP gar nichts zu tun hat. Da wenn ich das Wissen habe, die gar nicht Auftritt. Es geht darum, welche Prozesse laufen ab um das für den Prozess notwendige Wissen zu beschaffen und ganz wichtig wieder zu speichern und zwar so, dass es allen relevanten Beteiligten zu Verfügung steht! DC: allen Beteiligten? Es gibt Informationen, welche nicht jeder haben muss! Nii: das ist sicher so, da muss man eben Regeln aufstellen und das ist Teil des

Wissensarten zu unterscheiden erscheint sinnvoll	DC: Warum ist diese Unterscheidung relevant? Nii: Damit man weiss wie man das Wissen am besten speichert und weitergibt. Implizites Wissen kann ich eben nicht einfach aufschreiben. MP: man bräuchte dann aber jemanden, welcher die ganze Übersicht und Regeln aufstellt. RK: nein, nicht unbedingt, sondern eher Regeln, welche es attraktiv machen, so dass alle Mitarbeiter freiwillig diese Aufgabe übernehmen. D.h. jeder überlegt sich selber, ob andere im Unternehmen bestimmtes Wissen benötigen. FI: diese Freiwilligkeit ist das Problem, welchen Anreiz hab ich um Informationen weiterzugeben? Einerseits weiss ich gar nicht ob es jemanden interessiert und zweiten habe ich nichts davon. Das ist illusorisch! Nii: können wir soweit aber festhalten, dass das Prinzip als sinnvoll erscheint, allerdings massive Zweifel bestehen, ob es praktikabel umsetzbar ist.
Die Einflussfaktoren auf die Wissensprozesse sind relevant	RM: ja sicher sind diese relevant, ich sehe aber nicht was dies hilft. Solange man nicht weiss wohin die Reise geht! So lange kann ich an den Faktoren drehen wie ich will und es bringt gar nichts! Ich sehe dort eher, dass man strategisch kritische Prozesse sich anschaut. Ich könnte mir vorstellen, dass etwa in Krankenhäusern dies ein Thema sein könnte, wo es extrem kritische Prozesse gibt. Leider weiss ich aber nicht, ob die nicht schon so etwas haben bzw. die so standardisiert sind. Weiss dies jemand? RK: ich sehe dies so, wenn die WM Strategie festgelegt ist und man weiss wo man Ansätzen möchte, dann sind solche Betrachtungen der Faktoren sehr sinnvoll. Zum Beispiel bei uns wenn ein Berater einen guten Job beim Kunden gemacht hat, so ist es verdammt wichtig, dass andere Berater wissen, warum der Kunde dies als guten Job betrachtet hat. So dass der nächste von dieser Erfahrung profitieren kann. DC: Warum soll ich als Berater jemanden erzählen, warum ich einen guten Job gemacht habe, wenn ich nicht selber davon profitiere. RK: bezahlter Wissensaustausch nach Abschluss des Projektes, zusätzlich fakturierbare Stunden. DC: und wer zahlt das? Du? Nii: soweit sind wir noch gar nicht, ich möchte eigentlich nur die Grundideen diskutieren.
Kosten Nutzen Verhältnis erscheint problematisch	RM: das wurde auch schon gesagt, kaum einer von uns glaubt, dass man dies in einem grösseren Umfang irgendwo umsetzen könnte. Hierfür ist der Aufwand schlichtweg zu gross! DC/FI: da können wir uns nur anschliessen. RK: ich kann mir schon vorstellen, das als Pilot anzuwenden und mal zu schauen was passiert. MM: das Grundproblem bleibt, dass kein Unternehmen ohne Erfolgsnacheis für diese Idee Geld ausgeben wird! Nii: soweit will ich gar nicht gehen, sondern mal die Grundidee besprechen.
Zu hohe Komplexität	RM: das geht doch ins Gleiche, wir haben 3 Stunden gebraucht um zu verstehen was Ivan eigentlich meint. Wenn er jetzt damit auf ein Unternehmen los geht, so sorry: ist er nach 20 Minuten aus dem Gespräch raus. Nii: bin ja auch erst am Anfang, mal abwarten was dabei rauskommt! RM: nein, was ich damit meine ist, es ist für den normalen Einsatz im Unternehmen viel zu kompliziert. Bis man überhaupt jemanden an der Front die Vorteile erklärt hat. DC: ja das ist wirklich so.

Zu hoher Erklärungsbedarf, nicht für Jedermann verständlich	RM, ist wieder der gleiche Punkt: Komplexität ergibt hohen Erklärungsbedarf und geringe Bereitschaft mitzumachen weil der Nutzen unklar, nicht erwiesen ist!
Keine praktische Nutzennachweis	RM: dieser Teil geht genau wieder in das beschriebene Problem! Komplexität ergibt hohen Erklärungsbedarf und geringe Bereitschaft mitzumachen weil der Nutzen unklar, nicht erwiesen ist! Nii: bisschen das Henne Ei Prinzip, solange kein Nachweis das es was nützt, kommt man nicht weiter. RM: Nein, wenn es intuitiv überzeugend wäre, so könnte man was machen, das ist es aber nicht. Nii: wie macht man sowas intuitiv überzeugend? RM: dafür ist es das falsche Thema oder ein überzeugende Case mit Erfolgsnachweis, dann geht es schon.
Fehlende Vorgehensweise zur Umsetzung	RK: das ich wohl der klarste Punkt, wir haben keinen Ansatz wie man die Sache konkret angehen könnte. D.h. man muss hier mit eine überzeugenden Geschichte kommen. Könnte mir vorstellen einen ausgesuchten Prozess anzuschauen und dann den Erfolg anzuschauen. RM: wie messe ich den Erfolg? Nii: man fragt die Teilnehmer, wenn die es gut finden ist gut! RM: nicht unbedingt überzeugend um 100 TCHF zu investieren! Oder mehr! Nii: ja, in der Tat
Keine Verbindung zu gängigen WM Ansätzen	Fi: Was mir fehlt ist die Verbindung zum Beispiel zu WM-Strategien, wo das Unternehmen klar sich zur Bedeutung von WM äussert und die Rahmenbedingungen setzt. Wie passt dieser Ansatz dazu? Das ist mir nicht klar? RM: Die Frage ist eher, ob es eine gezielte „lokale“ Verbessrung von Prozessen sein soll und die strategische Sache ist losgelöst zu betrachten. RK: es geht wahrscheinlich eher in diese Richtung. MM Allerdings sehe ich die konkrete Situation nicht, wo man diesen Ansatz dann konkret umsetzt. Einerseits punktuell anderseits aber kompliziert genug, dass sich der Aufwand lohnt. Sehe ich als Problem. Nii: wir kehren wieder zur Frage zurück, ob die Sache umsetzbar ist. Wichtig ist , ob diese Ergebnisse soweit vollständig sind, falls ja Danke.

Appendix F

Guide for the Selection of an Organisation

The researcher prepared a short interview guide, shown below, including the following memos:

1. Background information about the researcher and the research.
2. Information about expected benefits and a short description of the implementation methodology.
3. The intended results, including the potential benefits.
4. The improvement methodology and the pre-conditions.
5. The interview was intended to end with the discussion of willingness to participate, general conditions for participation, support requirements of the researcher and the next steps.

The researcher agreed to meet both managers in their offices and the interviews were conducted in the same way. Recording of the interviews seemed not to be appropriate and the researcher did not ask for permission to make recordings.

1. Hintergrundinformationen

Grund für die Durchführung der Untersuchung.

➔ Istsituation: Berater beim MZSG und gleichzeitig Doktorarbeit

➔ Willkommene Möglichkeit um Arbeitstätigkeit mit Forschungsvorhaben zu kombinieren

➔ Auslöser für die Doktorarbeit waren erlebte „Schwierigkeiten“ während der Arbeitstätigkeit an notwendiges Wissen im Unternehmen zu gelangen.

- Mangel an Wissenstransfer zwischen Beratern und auch über Hierarchieebenen hinweg
- Keine Aufbewahrung von Wissen (Kulturproblem), da keine Ressourcen für diese Tätigkeit zugeordnet werden
- Keine Anreizsysteme um Wissenskultur zu ermöglichen
- Technologie als Kommunikationssystem ohne Fokus auf „Wissensmanagement“
- Erfahrung wurde durch Kollegen und Management und auch Theorie zu WM in KMUs bestätigt.

➔ Istsituation: Als Berater beim MZSG und gleichzeitig Doktorarbeit

- Wurde eine Vorgehensweise entwickelt zur wissensbasierten GP Optimierung

➔ *Slides siehe 11.1*

2. Vorteile fürs Unternehmen

   - Punktuelle Optimierung von BPs
   - Verbesserung der Wahrnehmung von KM
   - Verbesserung der Zusammenarbeit
   - Minimierung von spezifischen Schwächen

1. Skizze der Vorgehensweise

    - Vorbereitung
        - Auswahl GP
        - Grobplannung
        - Zusage Durchführung
    - Prozessaufnahme BP, KP, KMP
    - Analyse der Resultate und Ermittlung der Verbesserungspotential
    - Verbesserungsansätze und Umsetzbarkeit
    - Umsetzungsempfehlungen

2. Interesse an Umsetzung

    a. Bedingungen

    b. Zeitrahmen

    c. Unterstützung

    d. Nächste Schritte

Appendix G

Transcript from Interviews in Selection of Organisation

In order to minimise errors/losses through memory, detailed notes were taken during the interview, expanded on and clarified immediately after the interview. These notes were later transcribed and the transcript was sent by email to the interviewee to confirm its validity.

Thus, the researcher had two transcripts from the individual interviews and these are shown below. The analysis was limited to only one interview because, after the presentation of the slides, one interviewee was convinced that such a project would be too large for their small organisation. The organisation remaining was MZSG.

	Mal	SS
Folien	Technologieeinsatz sehe ich bei uns als einen der Ansätze Auch interne Kurse um Wissen weiterzugeben Etwas komplizierter Ansatz Was sagt RK dazu Könnte man vielleicht bei uns Einsätzen Unsere Organisation ist etwas hinderlich	Sehe Nutzen noch nicht Zu schwierig Dafür sind wir zu klein
Vorteile fürs Unternehmen • Punktuelle Optimierung von BPs • Verbesserung der Wahrnehmung von KM • Verbesserung der Zusammenarbeit • Minimierung von spezifischen Schwächen	Einzelne GP rausnehmen und optimieren kann ich mir schon vorstellen zum Beispiel Verkauf, Marketing, aber auch schreiben von Angeboten. Oder Nachfassen beim Projektende um Erfahrungen auszutauschen Mei Problem ist wer zahlt unseren Aufwand, damit die Leute mitmachen muss ich ein Projekt eröffnen.	Einzelne Prozesse ja, aber das Problem ist wir sind so klein, dass jeder sowieso jeden kennt. Das Problem bei Zusammenarbeit ist die Zeit und nicht das Wollen. Unsere Kultur ist schon gut und wir tauschen uns auch alle nach Möglichkeit aus. Aber Zeitmangel, wir sind Einzelkämpfer.
Skizze der Vorgehensweise - Vorbereitung - Auswahl GP - Grobplanung - Zusage Durchführung Prozessaufnahme BP, KP, KMP Analyse der Resultate und Ermittlung der Verbesserungspotential Verbesserungsansätze und Umsetzbarkeit Umsetzungsempfehlungen	Verstehe ich es richtig, man wählt einen Prozess aus, stellt die Leute zusammen und geht dann über die GP zu den WP und dann zum WM über. Dass heisst man ermittelt den Mechanismus der zwischen den Problemen und dem WM bestehen könnte. Dies aufgrund der Aussagen der Mitarbeiter. Die Verbessrungen betreffen aber alle Ebenen oder? Das scheint noch nicht klar zu sein.	Verstehe, dass macht aber bei uns keinen Sinn, da würden Sie teilweise nur mit einer Person reden, welche keine Schnittstellen hat. So wie ich Sie verstehe geht dies dann aber Richtung IM. Das ist nicht mehr in ihrem Interesse oder?
Interesse an Umsetzung	Könnte mir vorstellen sowas zu machen. Wir müssten allerdings die Kosten anschauen.	Nein, das kann man bei uns nicht machen.
Bedingungen	Kosten, wenn es unter einem bestimmten Betrag macht, Stunden der MA mit eingerechnet	
Zeitrahmen	Das hängt von Ihnen ab und den Mitarbeitern die allenfalls mitmachen	
Unterstützung	Welcher Art? Von mir. Im Sinne von Management Unterstützung, wenn Sie mir sagen in welcher Form dann kann ich entweder ja oder nein sagen.	
Nächste Schritte	Setzen Sie mit RK einen Plan auf und alles andere hängt von den Kosten ab.	

Appendix H

Transcript of Focus Group to Obtain Management Support

The same rules as used in earlier interviews and focus groups were applied. The focus group started with a short introduction by the researcher about the aim and purpose of the session. The discussion followed the topic guide. No shy or dominant individuals participated so the need to use moderating tactics was very limited.

Once discussion finished in the focus group, the researcher read back a summary of the notes taken and asked if any points would require clarification. The researcher later sent the transcript, which is shown below, to participants for verification.

Wissensorienterte Prozessverbesserung / Focus Group	
Teilnehmer: RK/DC/FI/BR	
Einleitung	Nii: Hintergrundinformationen Doktorarbeit
Zielsetzungen	Nii: gezielte Verbesserung der GPs RK wir möchten schon konkrete Verbesserungen erzielen. BR: im Key-acc haben wir konkret Probleme RK: vor allem untereinander, gleiche Kunden BR: historisch gewachsene Strukturen halt. RK: Meine Zielsetzng wäre es im Key-Acc Management konkret Verbesserungen zu erzielen DC: und was ist unsere Rolle hierbei? Wir haben eher das Bedürfnis das man sich den Bereich Offertenerstellen und Projekterfahrungen anschaut. Vor allem Projektdokumentation und Erfahrungsaustausch wären interessant. RK: Aber auch gemeinsame interne Kurse durchführen um den Erfahrungsaustausch intern anzugehen. Das ist besonders wichtig, Allein Dokumente austauschen reicht nicht. Dazu haben wir auch schon bereits Lotus Notes im Einsatz. Nii: wir sind da schon etwas weiter in der Diskussion! Welche Ziele soll das Projekt den haben? RK: Ich würde das Ziel so formulieren. Konkrete Verbesserung von 1 bis 2 GPs in einem ausgesuchten Bereich. Das legen wir noch später fest. BR: sehe ich auch so. Was: machen wir mit den Kosten? RK: Interne Projektnummer und interne Tagessätze, mit einer detaillierten Planung und Obergrenze fürs Projekt. Ivan hat die Projektleitung und muss die Sache und Kontrolle haben. Aufteilung auf unsere Bereiche hängt von den ausgewählten GPs ab.
Nutzen MZSG	Nii: Verbesserte Prozesse, Welchen konkrete Nutzen erwartet man: BR: Es soll eine konkrete Verbesserung der gewählten GPs als Ergebnis definiert werden. Nii: Wie messen wir das? RK: Beteiligte sagen ob es zur Verbesserung gekommen ist, das ist der Ansatz zur Messung. Was anderes sehe ich nicht. Nii: das hängt aber von der Akzeptanz der Verbesserungsmassnahmen und deren Umsetzung ab. RK: Es gibt zwei Stufen: erstens sind die Beteiligten in den GPs zufrieden. 2. Abhängig son der Umsetzungt, konkrete Verbesserungen nachweisen, wie und in welcher Form würde ich heute offen lassen.
Zeitrahmen	Nii: 2-3 Jahre BR: was, das geht nicht viel zu lange sehe etwa 6 Monate als Obergrenze. Nii: kommt drauf an was man als Projekt festlegt, ich bin von meiner Arbeit ausgegangen. Konkrete Laufzeit des Projektes kann definiert werden im Rahmen eines Projektauftrages. RK: setzen wir einen Projektauftrag auf und bestimmen dies. BR: einverstanden

Umsetzungsplan -Auswahl GP -Plan aufstellen -Audit GPs, KP, KMPs - Schwachstellen -Verbesserungs-Potentiale - Massnahmen	Nii: die Vorgehensweise ist wie folgt…… RK: Macht Sinn und bitte Zeiten im Projektauftrag einsetzen für die einzelnen Phasen.
Rahmenbedingungen	BR: Projekt intern eröffnen, Budget definieren Projektbeteiligte festlegen und detaillierte Planung ausarbeiten RK: den Projektantrag bis Ende Monat an mich ich kümmere mich um die Sache. Ivan bekommt bis Ende Monat dann ein ok BR: Müssen wir noch Fredmund fragen? RK: nein FI: was heisst das für uns? BR: im Moment nur dass du Ansprechpartner sein wirst bei der Planung, mehr nicht. Ivan kommt danach auf Euch zu.
Nächste Schritte	RK: Wie besprochen: Projektantrag an mich bis Ende Monat. Danach noch ein Treffen um das Projekt aufzusetzen.

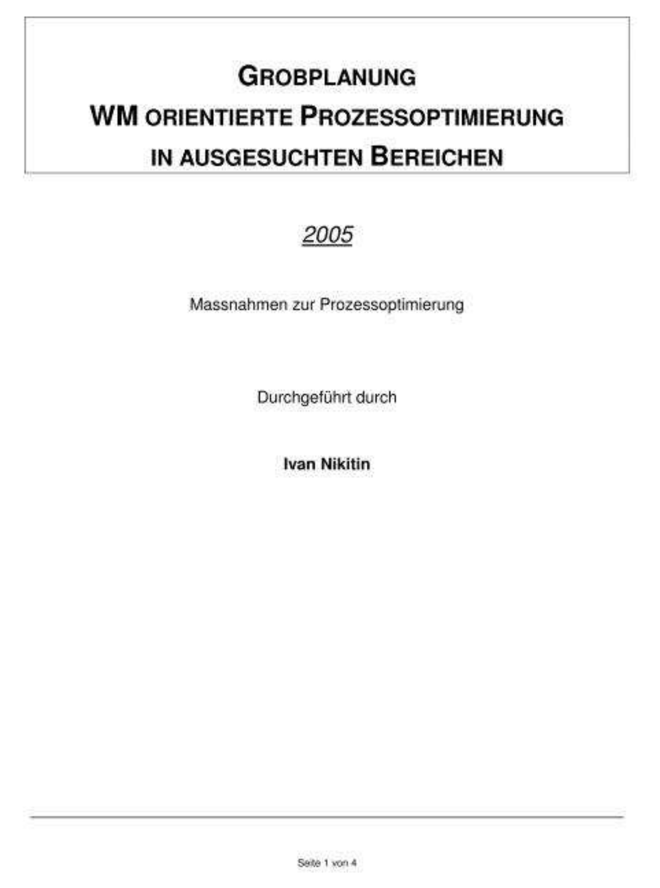
Appendix I

Project Proposal and Planning

The main data source for writing the project plan and proposal was the researcher's experience as an MZSG consultant, having previously written many project proposals. The project plan followed the improvement methodology from the KBBPI framework. Thus, the plan consisted of the following elements (see also chapter 5):

a) Initiation of the project.
b) Developing a root definition of the BPs to be redesigned.
c) Mapping BPs, KPs and KMPs.
d) Identifying improvement opportunities.
e) Formulating recommendations.

These five steps built the cornerstones for the implementation of the KBBPI framework at the MZSG.



GROBPLANUNG
WM ORIENTIERTE PROZESSOPTIMIERUNG
IN AUSGESUCHTEN BEREICHEN

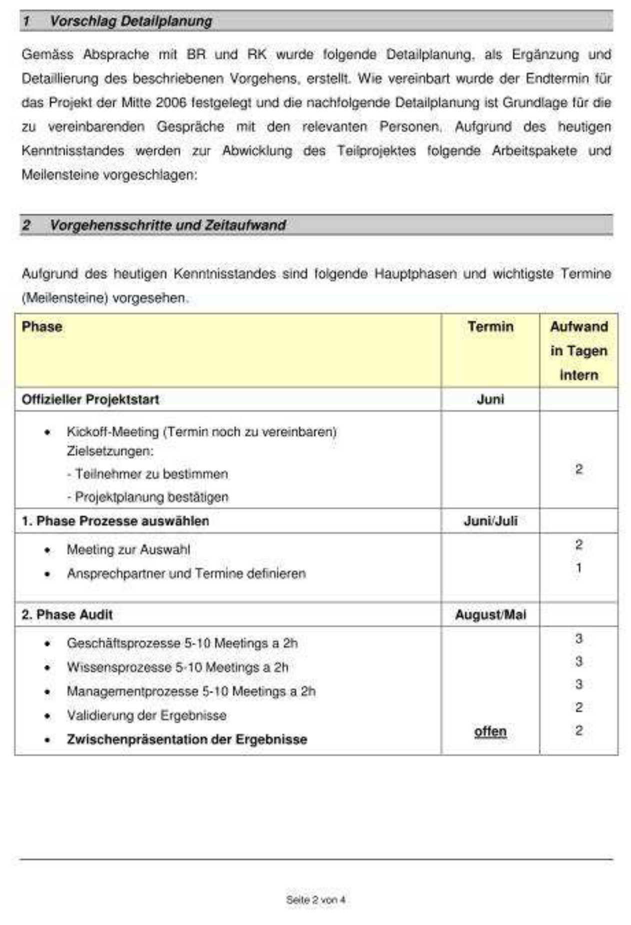
2005

Massnahmen zur Prozessoptimierung

Durchgeführt durch

Ivan Nikitin

Seite 1 von 4



1 Vorschlag Detailplanung

Gemäss Absprache mit BR und RK wurde folgende Detailplanung, als Ergänzung und Detaillierung des beschriebenen Vorgehens, erstellt. Wie vereinbart wurde der Endtermin für das Projekt der Mitte 2006 festgelegt und die nachfolgende Detailplanung ist Grundlage für die zu vereinbarenden Gespräche mit den relevanten Personen. Aufgrund des heutigen Kenntnisstandes werden zur Abwicklung des Teilprojektes folgende Arbeitspakete und Meilensteine vorgeschlagen:

2 Vorgehensschritte und Zeitaufwand

Aufgrund des heutigen Kenntnisstandes sind folgende Hauptphasen und wichtigste Termine (Meilensteine) vorgesehen.

Phase	Termin	Aufwand in Tagen intern
Offizieller Projektstart	**Juni**	
• Kickoff-Meeting (Termin noch zu vereinbaren) Zielsetzungen: - Teilnehmer zu bestimmen - Projektplanung bestätigen		2
1. Phase Prozesse auswählen	**Juni/Juli**	
• Meeting zur Auswahl		2
• Ansprechpartner und Termine definieren		1
2. Phase Audit	**August/Mai**	
• Geschäftsprozesse 5-10 Meetings a 2h		3
• Wissensprozesse 5-10 Meetings a 2h		3
• Managementprozesse 5-10 Meetings a 2h		3
• Validierung der Ergebnisse		2
• **Zwischenpräsentation der Ergebnisse**	**offen**	2

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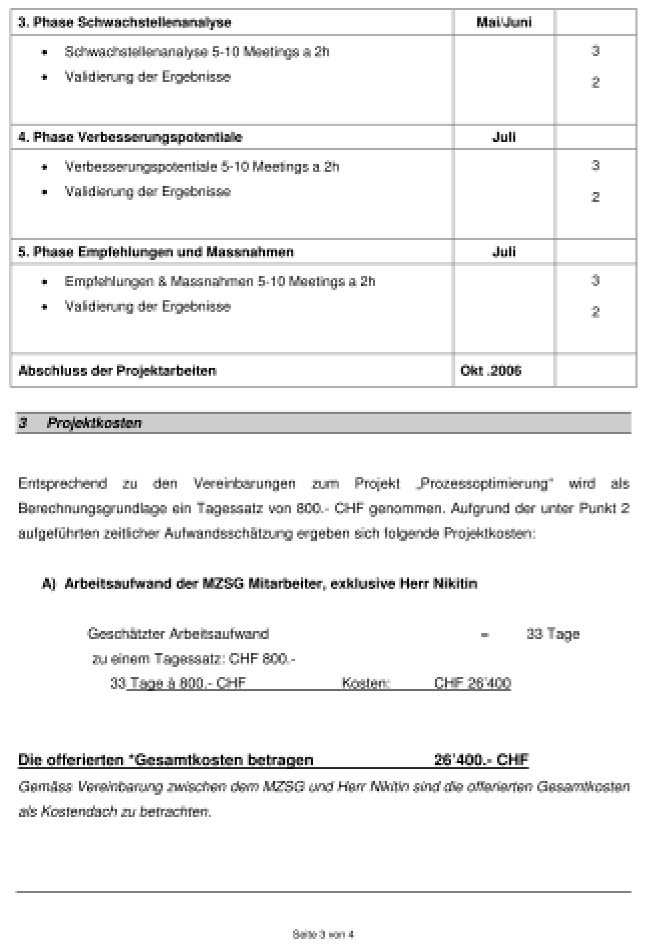

3. Phase Schwachstellenanalyse	Mai/Juni	
- Schwachstellenanalyse 5-10 Meetings a 2h - Validierung der Ergebnisse		3 2
4. Phase Verbesserungspotentiale	**Juli**	
- Verbesserungspotentiale 5-10 Meetings a 2h - Validierung der Ergebnisse		3 2
5. Phase Empfehlungen und Massnahmen	**Juli**	
- Empfehlungen & Massnahmen 5-10 Meetings a 2h - Validierung der Ergebnisse		3 2
Abschluss der Projektarbeiten	**Okt .2006**	

3 Projektkosten

Entsprechend zu den Vereinbarungen zum Projekt „Prozessoptimierung" wird als Berechnungsgrundlage ein Tagessatz von 800.- CHF genommen. Aufgrund der unter Punkt 2 aufgeführten zeitlicher Aufwandsschätzung ergeben sich folgende Projektkosten:

A) Arbeitsaufwand der MZSG Mitarbeiter, exklusive Herr Nikitin

Geschätzter Arbeitsaufwand = 33 Tage
zu einem Tagessatz: CHF 800.-
33 Tage à 800.- CHF Kosten: CHF 26'400

Die offerierten *Gesamtkosten betragen 26'400.- CHF

Gemäss Vereinbarung zwischen dem MZSG und Herr Nikitin sind die offerierten Gesamtkosten als Kostendach zu betrachten.

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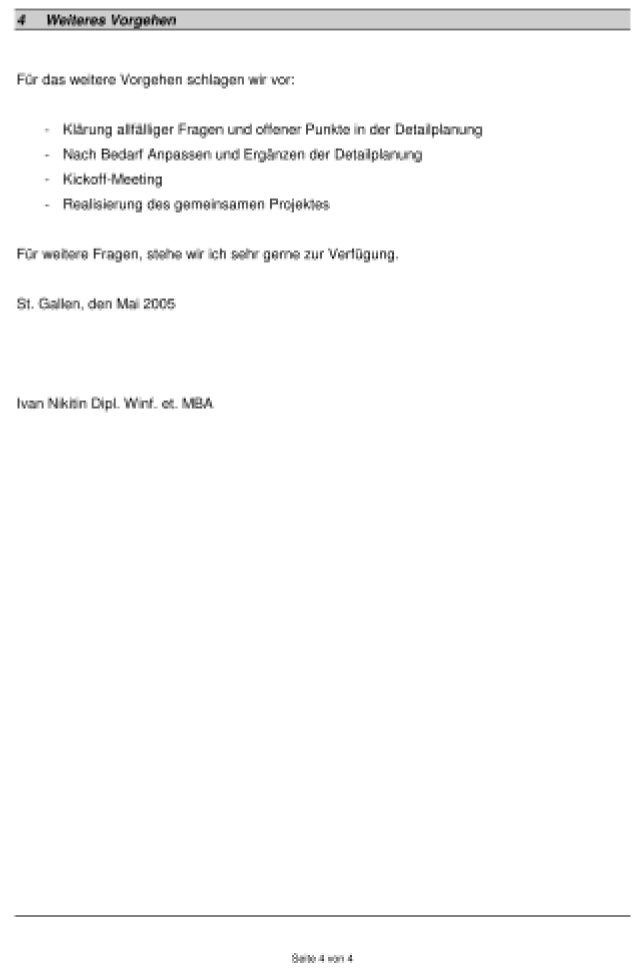

4 Weiteres Vorgehen

Für das weitere Vorgehen schlagen wir vor:

- Klärung allfälliger Fragen und offener Punkte in der Detailplanung
- Nach Bedarf Anpassen und Ergänzen der Detailplanung
- Kickoff-Meeting
- Realisierung des gemeinsamen Projektes

Für weitere Fragen, stehe wir ich sehr gerne zur Verfügung.

St. Gallen, den Mai 2005

Ivan Nikitin Dipl. Winf. et. MBA

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Appendix J

Example of the Transcript from Root Description

A short topic guide served as a summary statement of the issues and objectives to be covered. The topic guide also included questions for each area of interest, namely:

- Who are the actors, the people who operate the process?
- What transformation does the process perform?
- What is the "world view" of involved people?

The participants were contacted and informed in advance about the aim of the focus group. The researcher then reserved a room at the MZSG.

The researcher wrote one transcript from the focus group. The data analysis was limited to categorisation and interpretation of findings and these findings were sent to the participants for verification.

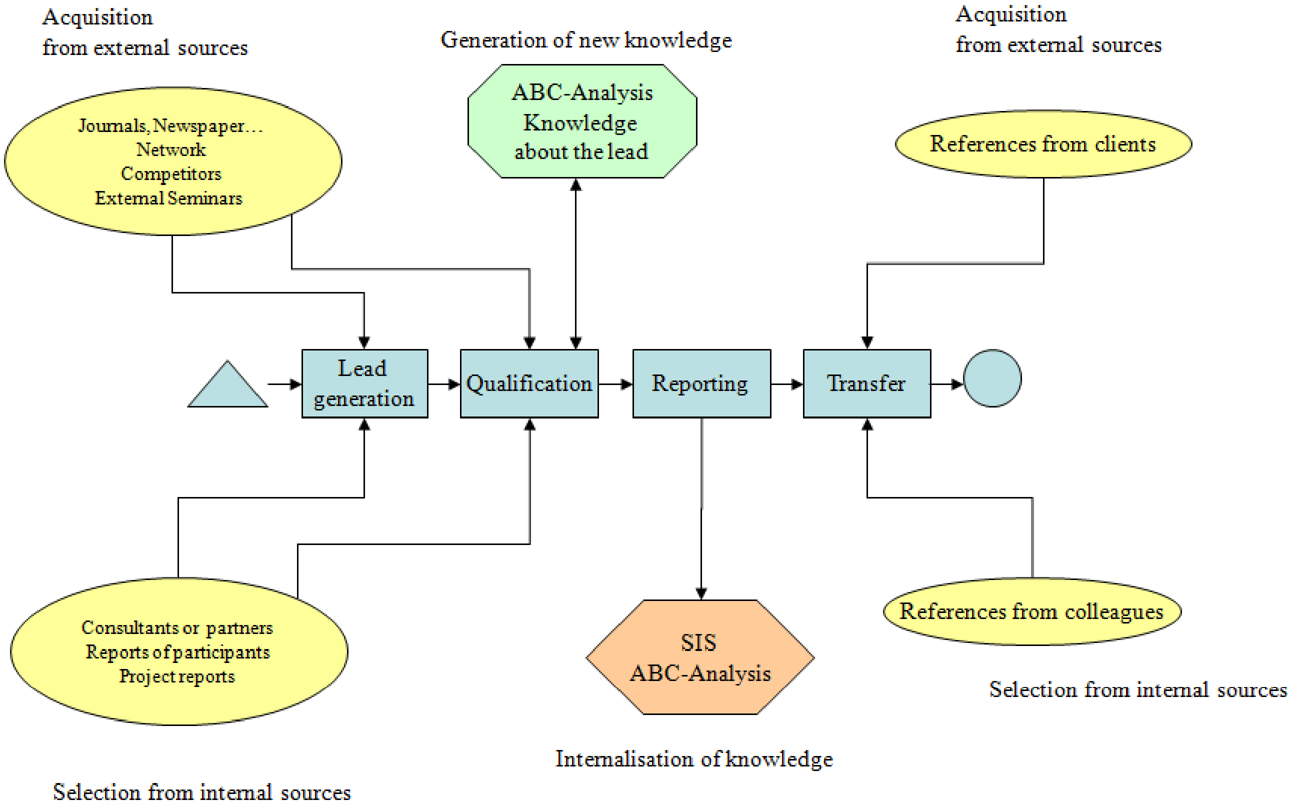
Wissensorienterte Prozessverbesserung / Focus Group	
Teilnehmer: RK / BR / DC / CF / GC / AS / SS /	
Key account Management	
Teilnehmer? Was wird gemacht? Beurteilung?	BR: Das machen nur wir (BR und RK). Das heisst jeder hat seine Kunden historisch gewachsen verteilt. RK: Unregelmässig je nach Bedarf wird mit Kunden Kontakt aufgenommen um entsprechend zu schauen ob es Ansätze für Projekte gibt. Meist Telefonkontakt. Allerdings pflege ich auch ohne „Hintergedanken" laufend Kontakt mit den früheren Kunden, Networking. Sehr wenig Neugeschäft. Ich würde sagen 3-4 neue Kunden maximal, der Rest ist aus bestehenden Kontakten BR: Zudem ist es so dass ich, wenn etwas erfolgsversprechend ausschaut ich den Kontakt entweder weiter selber bearbeite oder eben weitergeb. Das hängt davon ab ob kritisch oder nicht und wie gross. RK Mach ich genauso Nii: sind noch andere beteiligt. RK: ja, manchmal entsteht der Kontakt aus laufenden Projekten oder von Consultants die privat mit Personen aus dem Unternehmen Kontakt haben. BR: bei mir sind Kundenkontakte Chefsache und sobald der Vertrag da ist gebe ich es an den Partner und der kümmert sich um die Abwicklung Nii: kann ich zusammenfassen, dass dies eigentlich nur BR und RK machen Nii: wo liegen die Probleme? BR: eigentlich nur, dass wir uns manchmal gegenseitigstören und keine Ahnung haben was der eine oder andere macht. RK: Probleme sind konkret im Bereich des Wissensaustausches und des Informationsmanagements.
Offerten	
Teilnehmer? Was wird gemacht? Beurteilung?	RK: Das schreibe entweder auch ich oder es wird an einen Partner weitergegeben. DC: meist bekommen wir die Kontakte in der Phase, wo Interesse bereits besteht zugeordnet und ich nehme dann in einer spezifischen Sache Kontakt auf: CF: kommt vor dass Du es delegierst! Aber meist bist Du schon mit dabei. DC: nach der Kontaktaufnahme CF: Da gibt es Vorlagen, wer aber an wenn welche Offerte geschrieben hat, weiss ich nicht! Das kommt schon vor dass man an die gleiche Person 2 Offerten schickt oder diese kontaktiert RK: Handlungsbedarf besteht sicherlich genau in dem Bereich.
Lessons learned	
Teilnehmer? Was wird gemacht? Beurteilung?	GC: da machen wir gar nichts. Solange das Projekt erfolgreich war interessiert es niemanden. SS: Wenn man ein Projekt aussetzt wäre es schon hilfreich zu wissen, was andere gemacht haben! Vor allem vor dem Hintergrund, dass 90 bereits frühere Kunden waren. AS: sehe ich genaus so, habe oft Mühe herauszufinden wer, wo was, wann gemacht hat. Nii: gibt es Handlungsbedarf? GC: ja sicher SS: sehe ich auch!

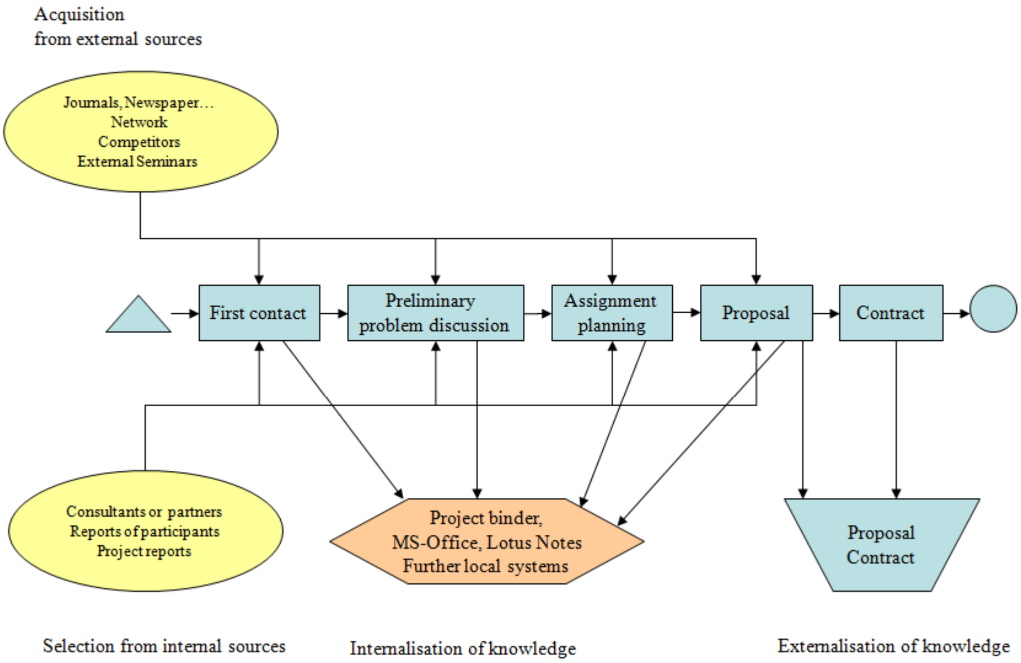
Appendix K

Example of the BP Map for Interviewing

A guideline for mapping the BP in the semi-structured interviews was developed, based on the identified elements from the KBBPI (Appendix L) and the interviewees were purposefully selected based on their involvement in BPs.

MZSG sub process "lead generation"


Acquisition
from external sources
Generation of new knowledge
Acquisition
from external sources
Journals, Newspaper…
Network
Competitors
External Seminars
ABC-Analysis
Knowledge
about the lead
References from clients
Lead generation
Qualification
Reporting
Transfer
Consultants or partners
Reports of participants
Project reports
SIS
ABC-Analysis
References from colleagues
Selection from internal sources
Internalisation of knowledge
Selection from internal sources


Acquisition
from external sources
Journals, Newspaper…
Network
Competitors
External Seminars
First contact
Preliminary problem discussion
Assignment planning
Proposal
Contract
Consultants or partners
Reports of participants
Project reports
Project binder,
MS-Office, Lotus Notes
Further local systems
Proposal
Contract
Selection from internal sources
Internalisation of knowledge
Externalisation of knowledge

Appendix L

Interview Guide to BP Mapping

A guideline for mapping the BPs in the semi-structured interviews was developed based on the identified elements from the KBBPI and the interviewees were purposefully selected based on their involvement in BPs. The guideline is shown below.

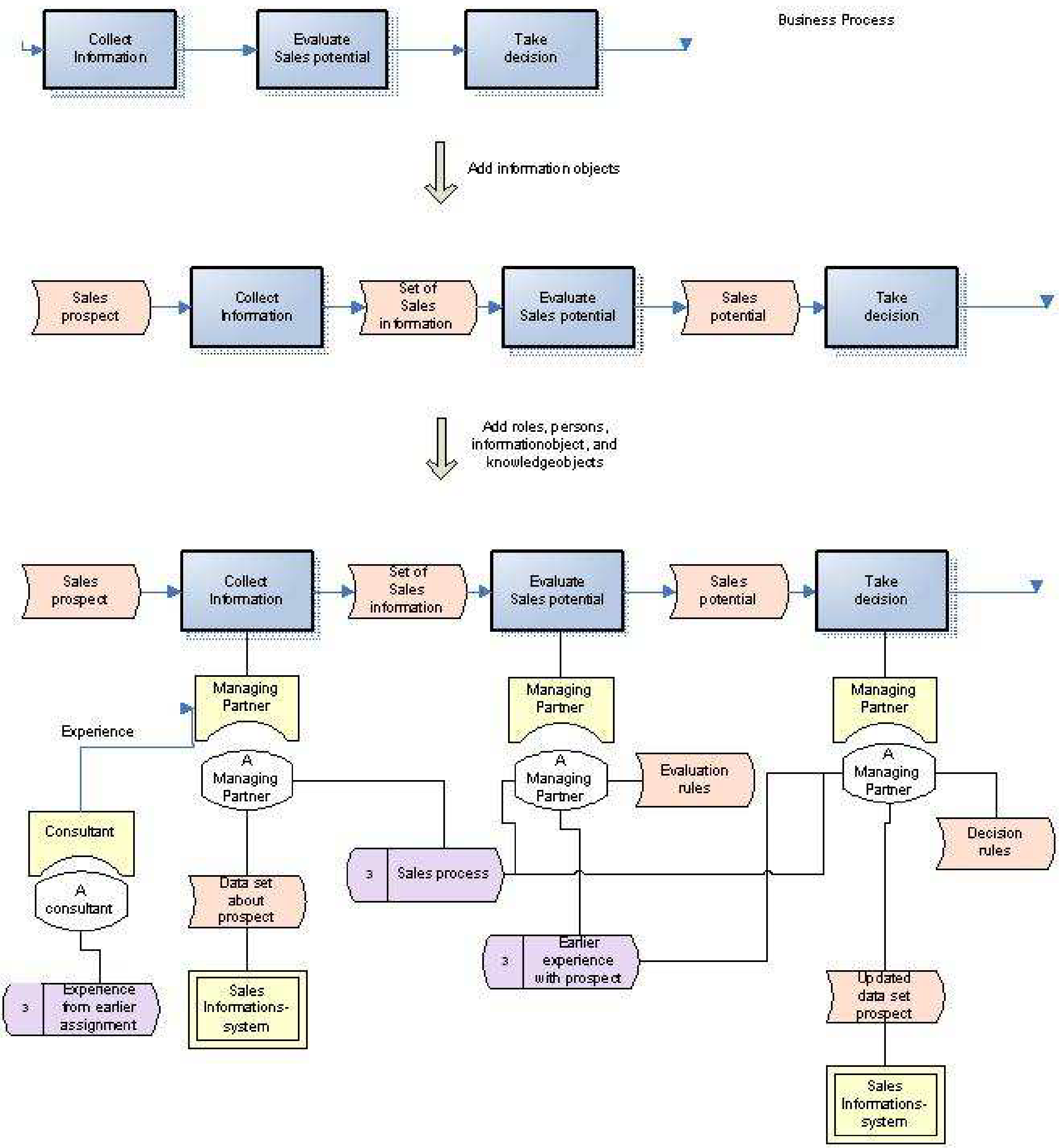
What activities are performed? (sequence?)	'Tasks' A task is defined as an atomic transfer from input to output, represented as information objects. Tasks are related to and are fulfilled by individuals with a specific role in the task.
Who performs each activity?	'Role', of a person allocated to the task 'Individual' a specific individual in the role of.
What kind (type) of knowledge/information is required?	'Knowledge object', is in principle a special form of resource because as all other resources it is required to produce the process output. Knowledge objects are stored and retrieved from the DOKB
What inputs are used respectively what outputs are produced?	'Inputs' are what are required to be able to complete the activities and produce the outputs. Inputs are transformed or used e.g., budget spend, materials etc. 'Outputs', are produced by the process
What decisions are made in the process? What controls the process?	'Controls' regulate the process; controls might be internal (agreed procedures, available budgets etc) or external (legislation, standards, availability of resource

Appendix M

Example of the BP Model

Before the first meeting, a draft of the selected BPs was developed on the basis of literature, document review and the researcher’s own experience. An example is given in Appendix L.

An initial version of the BP model (a graphical representation of the BPs) was used as a trigger for a detailed discussion (Appendix K).


Collect Information
Evaluate Sales potential
Take decision
Business Process
Add information objects
Sales prospect
Collect Information
Set of Sales information
Evaluate Sales potential
Sales potential
Take decision
Add roles, persons, informationobject, and knowledgeobjects
Sales prospect
Collect Information
Set of Sales information
Evaluate Sales potential
Sales potential
Take decision
Managing Partner
A Managing Partner
Experience
Consultant
A consultant
3 Experience from earlier assignment
Data set about prospect
Sales Informations-system
3 Sales process
Managing Partner
A Managing Partner
Evaluation rules
3 Earlier experience with prospect
Managing Partner
A Managing Partner
Decision rules
Updated data set prospect
Sales Informations-system

Appendix N

Interview Guide to KP Mapping

The objective of this implementation step was to map the KPs and integrate them into the BP model. The same interviewees as in BP mapping participated and only a limited number of new interviewees were added.

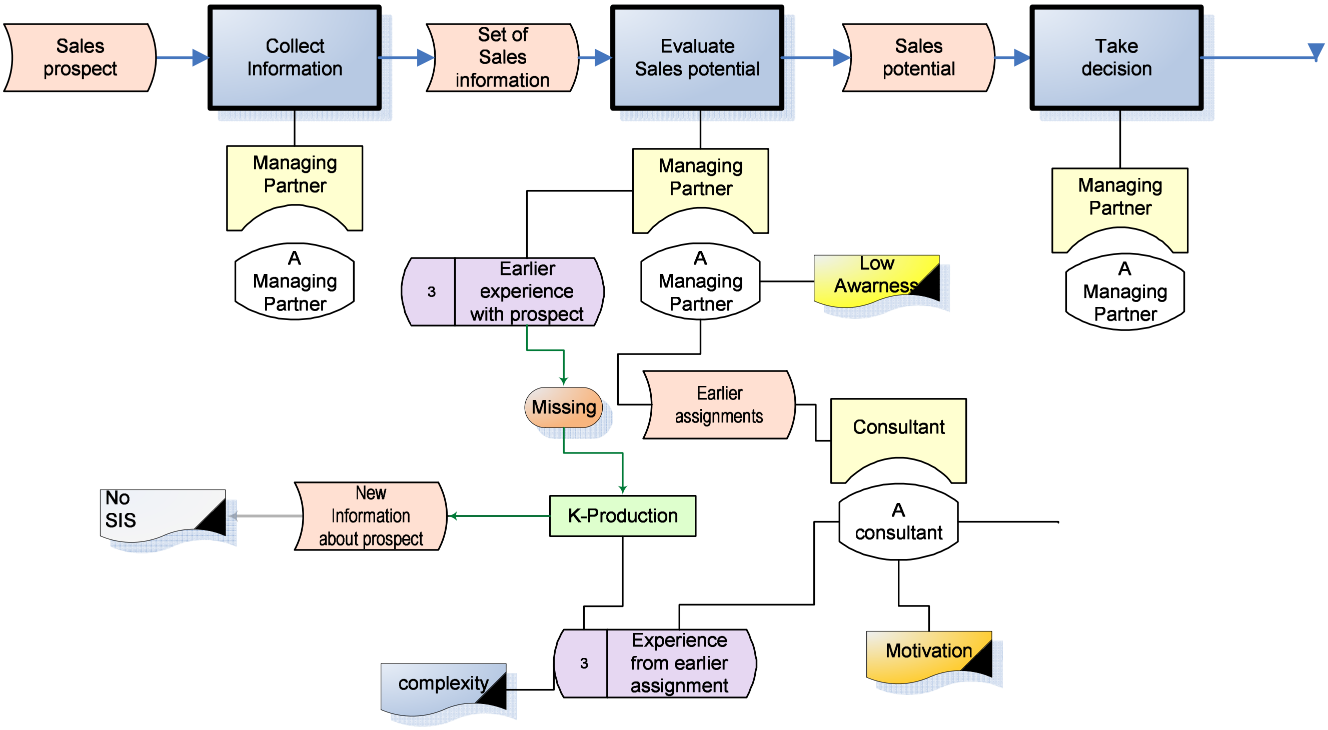
The new interviewees were purposefully added, based on their function in the investigated BPs. The interviews that followed were arranged over a period of a few months and a total of ten individuals participated. The researcher developed a short interview guide.

What knowledge gaps can be identified in the BPs?	'*Knowledge gap'*, the mismatch between what the person knows and what the person should know.
What KPs are performed in relation to the gap? (sequence?)	'*Knowledge process'* can be identified as taking place inside process functions. In the KLC, these processes belong to two categories, that of knowledge production and that of knowledge integration.
How do you access the knowledge object?	'*Knowledge attributes'*, refers to characteristics which negatively affect knowledge sharing: • A high level of tacitness of knowledge. • A high level of complexity of knowledge. • Low usability of knowledge.
How do you access the knowledge producer? Role, as well as individual.	'*Attributes* of the *knowledge prod*ucer', the individual factors (motivation, reliability, understanding)
How do you access the knowledge receiver? Role, as well as Individual.	'*Attributes* of the *knowledge receiver'*, the individual factors (motivation, awareness, absorptive capacity)
How do you access the related infrastructure?	'*Attributes* of the *infrastructure'*, physical organisational infrastructure and ICT.

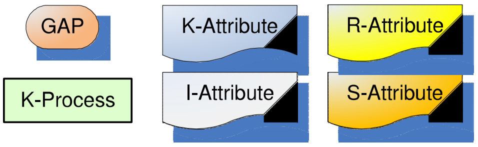
Appendix O

Example of the BP-KP Model

The developed BP model served as a tool for visualisation and discussions. At the beginning of the interviews, the researcher presented the elaborated BP model and started interviewing in order to identify the knowledge problems, called ‘gaps’.


Sales prospect
Collect Information
Set of Sales information
Evaluate Sales potential
Sales potential
Take decision
Managing Partner
A Managing Partner
Managing Partner
3
Earlier experience with prospect
A Managing Partner
Low Awarness
Managing Partner
A Managing Partner
Missing
Earlier assignments
Consultant
No SIS
New Information about prospect
K-Production
A consultant
3
Experience from earlier assignment
complexity
Motivation

Standardised KP notification symbols


GAP
K-Attribute
R-Attribute
K-Process
I-Attribute
S-Attribute

Appendix P

Interview Guide to KMP Mapping

The transcripts from these interviews were analysed and the mapping of the KPs was continuously improved. As before, detailed notes were taken during the interview and expanded by observations and memos.

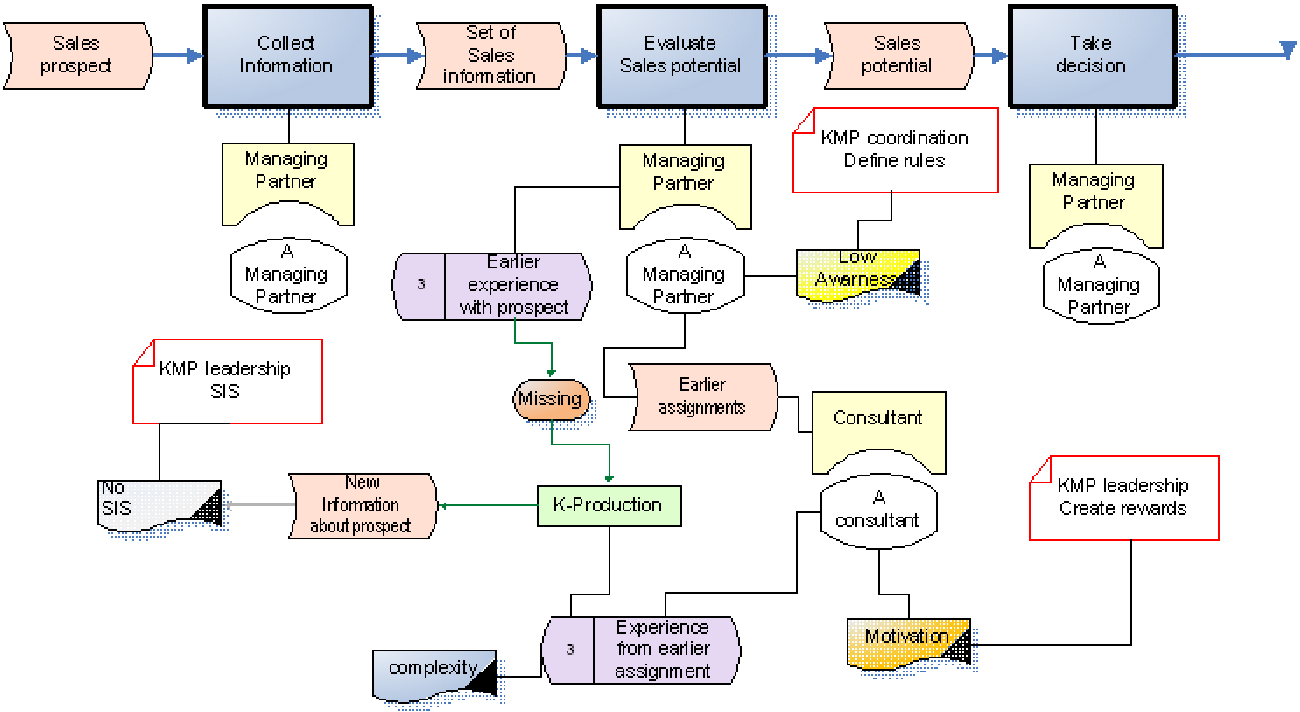
As a result of the series of interviews, the BP-KP model continuously evolved. The developed BP-KP model was presented and confirmed in a focus group session with five participants. The result was a validated version of the BP-KP model, an example of which is given below.

What requirements regarding the identified KPs exist? With the focus on: 'knowledge' 'knowledge producer' 'context'	*Tasks* A task is defined as an atomic transfer from input to output, represented as information objects. Tasks are related to and fulfilled by individuals with a specific role in the task. KMP activities are: • *Knowledge leadership*, establishing conditions that enable and facilitate fruitful conduct of KPs. • *Knowledge coordination*, managing dependencies among KPs to ensure that proper processes and resources are brought to bear adequately at appropriate times. • *Knowledge control*, ensuring that needed knowledge processors and resources are available in sufficient quantity and quality, subject to security requirements. • *Knowledge measurement*, assessing values of knowledge resources, knowledge processors, and their deployment.

Appendix Q

Example BP-KP-KMP Model

As a result of the series of interviews, the BP-KP model continuously evolved. The developed BP-KP model was presented and confirmed in a focus group session with five participants. The result was a validated version of the BP-KP model, an example of which is given below.

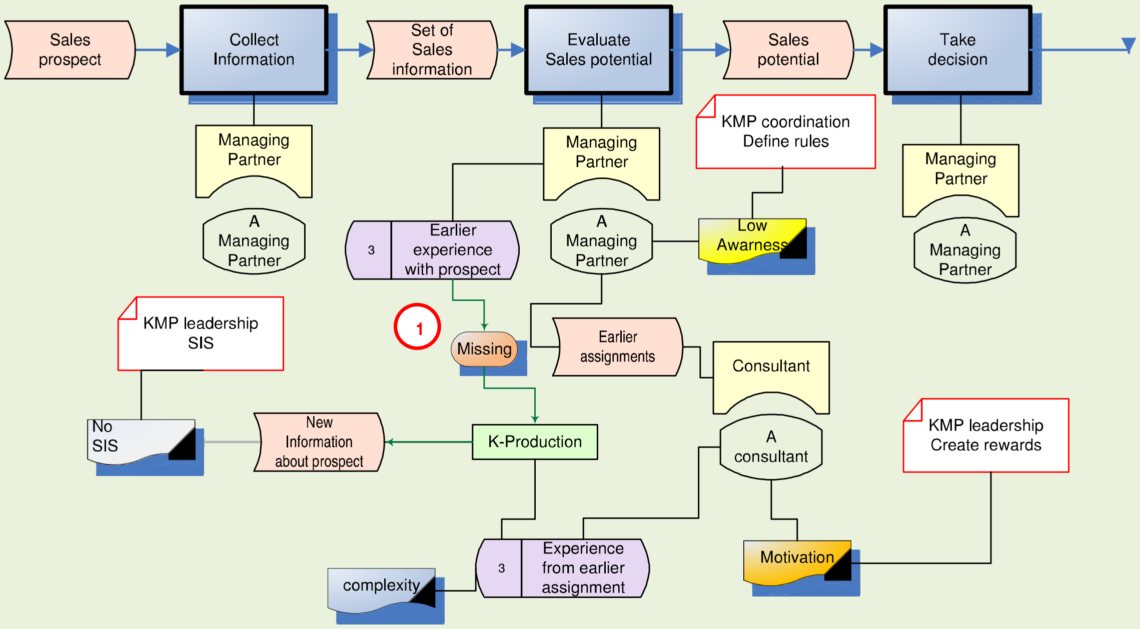

Sales prospect
Collect Information
Set of Sales information
Evaluate Sales potential
Sales potential
Take decision
Managing Partner
A Managing Partner
Managing Partner
KMP coordination Define rules
Managing Partner
3
Earlier experience with prospect
A Managing Partner
Low Awarness
A Managing Partner
KMP leadership SIS
Missing
Earlier assignments
Consultant
KMP leadership Create rewards
No SIS
New Information about prospect
K-Production
A consultant
3
Experience from earlier assignment
Motivation
complexity

Appendix R

Example of the Improvement Opportunities

An important finding from the focus group was the impracticability of discussing improvement opportunities with all of the participants. The identified improvement opportunities were very task-specific and only a few individuals were familiar enough, or interested, to discuss it. Thus, three further interviews with selected individuals were arranged in order to confirm findings.

The result of the analysis process was a categorised collection of improvement opportunities along with the tasks in the BP, internally called an "Improvement Opportunities Report".


Sales prospect
Collect Information
Set of Sales information
Evaluate Sales potential
Sales potential
Take decision
Managing Partner
A Managing Partner
Managing Partner
KMP coordination Define rules
Managing Partner
3 Earlier experience with prospect
A Managing Partner
Low Awarness
A Managing Partner
KMP leadership SIS
1
Missing
Earlier assignments
Consultant
No SIS
New Information about prospect
K-Production
A consultant
KMP leadership Create rewards
complexity
3 Experience from earlier assignment
Motivation

- Knowledge leadership, establishing conditions that enable and facilitate fruitful conduct of KPs
- Knowledge coordination, managing dependencies among KPs to ensure that proper processes and resources are brought to bear adequately at appropriate times
- Knowledge control, ensuring that needed knowledge processors and resources are available in sufficient quantity and quality, subject to security requirements
- Knowledge measurement, assessing values of knowledge resources, knowledge processors, and their deployment

Identified Weakness	Evaluation	Impact	Effort to solve
1.	Lack of knowledge about prospects in order to execute sales activities	high	high
1.1 KP	Lack of information regarding availability of information about earlier assignments	high	low
1.1.1KMP	Leadership problem requirement regarding infrastructure → software problem requirement regarding motivation to use SIS	High Low high	Low Low High
1.1.2KMP	Coordination problem requirement organisational rules	High	High
1.1.3KMP	Control requirement to control quality of content in the SIS	high	High
1.2 KP	Lack of awareness that potential knowledge is available inside the organisation	high	Medium
1.2.1 KMP	Leadership problem requirement to increase awareness → cultural problem	High	High
1.3 KP	Lack of motivation of the consultant to share knowledge	high	Low
1.3.1 KMP	Coordination problem Change in reward system	low	Low

Appendix S

Example of the Evaluation Transcript

This evaluation of the KBBPI framework was executed in parallel and interlinked with the implementation (see Section 6.2). One data collection method was the formally agreed interviews with the participants. The evaluation topics of the KBBPI framework were covered in the same individual interview by asking the participants:

- What worked?
- What did not work?
- Why did it not work?

At the end of this process, the researcher had transcripts from eleven interviews (several participants made only a short comment such as "went well" and they were excluded), a sample transcript is given below.

Probleme: WP Erfassen
Teilnehmer: AC / Datum: 9.06
Evaluation Problembereiche
Keine Anmerkungen Nii

Was lief gut?	Visualisierung mittels GP Modell war sehr hilfreich Habe den Prozess gut und schnell verstanden, Hat Spass gemacht! Organisation des Interviews war gut.
Was lief nicht?	Hat lange gedauert! Die Diskussion erschien mir zu wenig fokussiert. Auch war nicht klar welche Ziele verfolgt werden mit dem WP erfassen! Sehr detailliert, zu detailliert, wir haben 90 Minuten gebraucht um einen kleinen Abschnitt zu diskutieren.
Warum?	Zeitaufwand war das Hauptproblem, wir sind immer wieder in zu allgemeine Diskussionen verfallen. Das hat Zeit gekostet. Man muss die Sache viel fokussierter durchziehen.

Appendix T

Summary of the Evaluation Problems

Due to the familiarity of the researcher and participants with the topic and objectives, only a list of criteria for evaluating recommendations in the focus group was elaborated (based on literature). This list included the following criteria for evaluating recommendations:

- Are they clear calls to action? That is, do the recommendations use simple and direct language, set out what needs to be done, where and when it needs to be done, and by whom.
- Are they based on the evidence presented, clearly indicating why action should be taken?
- Are they meaningful for the MZSG?
- Are they likely to be implemented?

The starting point for elaboration of recommendations was the "Improvement Opportunities Report" (example given in Appendix R) and recommendations were derived on the basis of the portfolios from the report. These recommendations were written down on a white board and discussed on the basis of them being suggested criteria. The focus group ended with a validated list of recommendations.

	Was lief gut?	Was lief schlecht?	Warum?
Auswahl Firma	Sehr schnelle Zusage für Interviews, aber schwierige Auswahl.	Geringe Bereitschaft sich auf Gespräche einzulassen	Angst vor Aufwand, geringes Intersse
		Arbeitgeber hat Nachteile	Angst vor Aufwand
Managamenet Support	Optimal, keine Probleme		
Projekt Plan	Optimal, keine Probleme	Keine Unterstützung erhalten bei Ausarbeitung	Keine definierten Ansprechpartner
Auswahl BP		Anfänglich sehr verzettelt	Unklarer Nutzen Konzept nicht wirklich erfasst
Erfassen Geschäftprozesse	Prozesserfassung problemlos		
		Zielsetzung anfangs unklar	WM im Kopf aber BP gemacht?
		Tools schlecht	Keine Erfahrungen
	Grafische Visualisierung sehr gut		
		Datenmanagement	Keine Tools
		Wie erstellen der Geschäftsprozesskarten	Alle sind hier Experten!
		Wissenselemente und W-typen müssen gemeinsam erfasst werden	Macht logisch Sinn
		Generell viel Aufwand	Der nicht zum Projekt gehört!!! So entsteht der Eindruck der Ziellosigkeit! Detaillierungsgrad extrem hoch
Erfassen Wissensprozesse	Spannend hat Spass gemacht		War neu und hat die Personen interessiert
		Sollte gleichzeitig mit GP erfassen erfolgen	Hängt logisch zusammen und Einarbeitungsaufanw um wieder ins Thema zu kommen
		Ungeeignete SW Werkzeuge	Keine Erfahrung
		Fehlende Notation	Keine Erfahrung
		Zu wenig fokussiert	Keine Erfahrung
		Nii wusste selber nicht genau was er macht	Keine Erfahrung
		Rolle und Person ergeben eine problematische Situation	Aufwand und Änderung bei Stellenwechsel
Erfassen WM Prozesse		Keine Erfassung möglich	Fehlen beim MZSG, weil nicht im Fokus bisher Konsequenzen sind unklar
		Unklar ob Konzeptfehler	Keine Erfahrungen
		Fehlende SW und Tools	Keine Erfahrungen und keine Tools
Verbesserungspotential		Zu aufwendig alle Prozesse zu diskutieren Wichtigste Erkenntnisse sind relativ früh ersichtlich	Keine Erfahrungen
		Detaillierungsgrad zu hoch	
		Umsetzbarkeit	Keine Erfahrungen und Frage des Kommitments von oben
		Sollte alles in einem Schritt passieren	Keine Erfahrung
Empfehlungen	Ergeben sich automatisch		
	Gut ist, dass die Teilnehmer selber dies Empfehlungen formulieren		
		Wie weit stammen Empfehlungen wirklich aus dem Prozess	

Appendix U

Topic Guide for the Focus Group for Solutions to Problems

The solutions to the problems experienced have been identified and discussed. The next step was to investigate by using a focus group, how the participants perceived the proposed alterations or additions to the KBBPI framework. The topic guide for the focus group was distributed in advance to the participants and included a short description of the problems and the corresponding proposed solutions, which is given below.

Problem	Ursachen/Gründe	Lösungsansatz
1. Schwierigkeiten geeignete interessierte Unternehmen zu finden	hohe Komplexität, keine Referenzen kein Netzwerk allg. Wahrnehmung Wissen	Komplexitätsreduzierung
2. Teilnehmermotivation zur Projektteilnahme	hohe Komplexität, keine Referenzen Nutzenproblematik allg. Wahrnehmung Wissen Wichtigeres zu tun!	Komplexitätsreduzierung Marketing für „Wissenfragen" im Unternehmen
3. Unklare Zielsetzungen, während der Umsetzung	Mangelnde Erfahrung	Keine, besser drauf achten, nächstes Mal wird es besser
4. Fehlende Unterstützung Stufe FM und RK	Keine Zeit	besser drauf achten, nächstes Voraussetzung für Erfolg →Leitfaden
5. Keine Werkzeuge für Datenverwaltung, gemeinsamer Internetzugriff	Mangelnde Erfahrung	SW beschaffen
6. Visualisierung GP-WP-WMP Mappen	Mangelnde Erfahrung	SW beschaffen
7. Notifikation der von GP-WP-WMP	Fehlende Kenntnisse	Hat sich gelöst durch Einführung entsprechend standardisierter Symbole
8. Teilweise schwierige Gespräche wie GPs erfasst werden sollen	Fehlende Kenntnisse persönliche Erfahrung	Hat sich erledigt
9. Zeitlich aufwendige Erfassungsprozesse auf 3 Stufen	Aufwand Wiedereinarbeitung Doppelte Diskussionen Doppelspurigkeiten allgemein	Nur 1 Prozess zur Erfassung, GP Karten werden als Voraussetzung definiert
10. Doppelspurigkeit Erfassen der Wissensattribute und anschliessende Diskussion	Gründe wie 9	Siehe 9
11. Zu hoher Einführungs- und Umsetzungsaufwand zu komplizierte Einführungsschritte	Einführungsvorgehen	Komplexitätsreduktion
12. Erfassen von individuellen Daten der Personen	Ethische Probleme, einige wollen das nicht und machen nicht mit, geben auch nicht die richtigen Informationen	Keine, muss von Fall zu Fall entschieden werden, Freiwilligkeit
13. Fehlende Wissensprozesse	Keine vorhanden beim MZ	Keine
14. Detaillierungsgrad mit sehr hohem Aufwand verbunden	-	Keine
15. Nutzensnachweis fehlt fürs gesamte Vorgehen	Fehlende Erfahrung	Keine

Appendix V

Results from the Focus Group for Solutions to Problems

The themes were pre-defined by the topic guide (see Appendix U) and the analysis was undertaken to identify patterns and summarise the findings, as well as to develop categories and to interpret them. The results from the focus group are presented in the following table.

Wissensorienterte Prozessverbesserung / Focus Group / Problembereich Projekt	
Teilnehmer: RK/SS/DC/FI/GC/AS	
Punkt 1 Schwierigkeiten geeignete interessierte Unternehmen zu finden	Nii: im Prinzip gehört diese Punkt nicht zur Frage der Verbesserung aber mehr der Umsetzung RK: Tatsache ist wie Du schreibst dass Komplexität, Neuartigkeit und unbekannter Nutzen die Ursachen sind, dass man zögerlich ist. Vor allem wenn man dies als DL aufsetzen möchte. Du müsstest eine Story haben um die Sache zu verkaufen und vor allem am Angang massiv die Komplexität rausnehmen, das stösst die Leute sofort ab. So etwas wie eine Verkaufsstrategie finden. Nii: im Prinzip schon richtig aber, die ist nicht mein Interesse. Viel eher muss einfach die Komplexität aus dem Modell, verkaufen will ich es ja primär nicht! FI: Ich denke man könnte es schon „verkaufen“, richtig aufgesetzt bei hochkomplexen und unbekannten, nicht gemappten Prozessen. RK : sehe ich auch so, eventuell in Kombination mit anderen Reorganisationsaktivitäten. Nii: können wir soweit mitnehmen, dass Komplexität reduziert werden sollte und eine „Salesstrategie“ existieren sollte um die Leute abzuholen? RK: denke das wäre es.
Punkt 2 Teilnehmermotivation zur Projektteilnahme	RK: das geht ins gleiche rein wie vorher. Nii: schon es gibt aber paar zusätzliche Aspekte, wie Wahrnehmung und Kultur. Bei uns sind die C. ja nicht unbedingt bereit etwas zu machen was nicht zusätzlich vergütet wird. GC: Ich habe eigentlich gerne mitgemacht das war kein Thema. AS: gilt auch für mich, wenn ich sowieso im Büro bin, kann ich auch etwas anderes machen, allerdings muss ich es als sinnvoll erachten, Nii: und war es nicht sinnvoll? AS: Doch, aber ich weiss noch immer nicht was man mit den Ergebnissen macht. Wir wissen nun dass wir hier teilweise massive Probleme haben und haben keinerlei Informationen darüber was jetzt passiert! RK: ich habe doch gesagt dass wir die Sachen angehen werden und dies steht fest FM hat entsprechend auch seine Bereitschaft erklärt für die Sache Geld auszugeben. Das steht fest fürs nächste Jahr! Nii: ist dies durch das Projekt verursacht? RK: würde so sagen teilweise mit beeinflusst, Nii: dies wäre ein konkreter Nachweis dass die Sache was gebracht hat RK: nur teilweise, da wir nicht wissen wodurch verursacht. Nii: die Aussage halte ich für spekulativ, wenn ein Stein auf mein Auto fällt kann die Beule auch durch was anderes entstanden sein. RK: nein, ich meine ob man den ganzen Aufwand braucht oder die Sache auch einfacher zu haben ist. D.h. die gleichen Effekte ohne den ganzen Aufwand! Nii: ok, was nehmen wir zur Teilnehmer Motivation mit? SS: Ich war offengesagt manchmal schlicht überfordert und sah denn Nutzen nicht. Später ist das etwas besser geworden. Besonders wichtig erscheint mit, das man klar sagt was sind die Ziele und man sauber durch den Prozess geführt wird, sorry wenn ich das sage, dass hast Du nicht wirklich optimal gemacht. Nii: nehme ich auf mich. SS: Die ganzen Diskussionen über das Modell am Anfang kannst Du dir auch sparen dass interessiert keinen, ich will nur wissen was gemacht wird und was dabei rauskommt und zwar nicht theoretisch sondern direkt für mich persönlich.

Punkt 3 Unklare Zielsetzungen, während der Umsetzung	DC: das haben wir gerade durch, SS sagte ja, einfach sauber führen sonst geht die Sache schief! Das muss man besser machen. Komplexität kann im Modell bleiben, aber die brauchen die Teilnehmer gar nicht zu kennen. Mach eine Block-Box draus!
Punkt 4 Fehlende Unterstützung Stufe FM und RK	Nii: das geht in die gleiche Richtung, ich war mir von Anfang an bewusst dass wir das brauchen. FM sagte das ja auch zu. Allerdings habe ich nicht bedacht, dass man so etwas wi einen gemeinsamen Auftritt von FM und RK bräuchte um die Sache zu starten, so ein Kickoff mit top MM Unterstützung. SS: ja das ist es.
Punkt 5 Keine Werkzeuge für Datenverwaltung, gemeinsamer Internetzugriff	RK, das ist die Problem dazu habe ich nichts zu sagen.
Punkt 6 Visualisierung GP-WP-WMP Mappen	SS: wie vorher P5
Punkt 7 Notifikation der von GP-WP-WMP	GC: dass einzige was hierzu sagen ist, dass ich die Visualisierung sehr gut fand, gegen Ende. Am Anfang war es das reine Chaos. RK: ja, genau das war es. SS: das musst Du die auch etwas zuschreiben lassen. Nii: und was hätte ich machen soll: RK: vorher Pilot mit einer kleinen Gruppe, das bei uns war zu gross! Nii: schwierig zu sagen, nehme ich auf!
Punkt 8 Teilweise schwierige Gespräche wie GPs erfasst werden sollen	SS: das wiedeholt sich , aus meiner Sicht wie P7 Du hast selber nicht genaus gewusst was Du machts, ob man das mit einem Pilot des Pilot hätte verhindern können weiss ich nicht! Hat sich ja erledigt
Punkt 9 Zeitlich aufwendige Erfassungsprozesse auf 3 Stufen	RK: Ich kenne das ja genau und die Sachen kosten einfach Zeit, so einen Tag einem Prozess kommt hin und wenn man noch zusätzlich neue Element rein bringt die man nicht kennt wird noch komplizierter! Ich bin nicht einmal sicher ob das ein Problem ist! Die Frage ist was macht man dann mit den Prozesslandkarten verstauben die oder macht man wirklich konkret was damit. Was aber exterem schwierig zu rechtfertigen ist, ist der Aufwand um am Ende mit paar Vorschlägen zu WM zu kommen! Das ist schon sehr akademisch und in einem echten Projekt hättest Du das Problem die Kosten zu rechtfertigen. Was ich meines ist ob der ganze Aufwand lohnt und ob man nicht einfacher zu den gleichen Ergebnissen kommt. Obwohl ich schon sehe dass man durch die Detaillierung extrem genau weiss wo die Problempunkte liegen. Von der Seite her ist das schon spannend! Nii: danke.
Punkt 10 Doppelspurigkeit Erfassen der Wissensattribute und anschliessende Diskussion	GC: kann es nur unterstützen, das ergibt vielleicht eine etwas längere Sitzung, aber wenn diese gut vorbereitet ist und das Ziel ist klar so ist es optimal. RK, sehe ich auch so und man macht es im GPM so, 1 Sitzung und diese dauert bis man den Prozess durch hat und nicht immer wieder stückweise!.
Punkt 11 Zu hoher Einführungs- und Umsetzungsaufwand	FI: vereinfachen kann nicht schaden aber das Kernproblem lag nicht dort, sondern wie Du es gemacht hast.

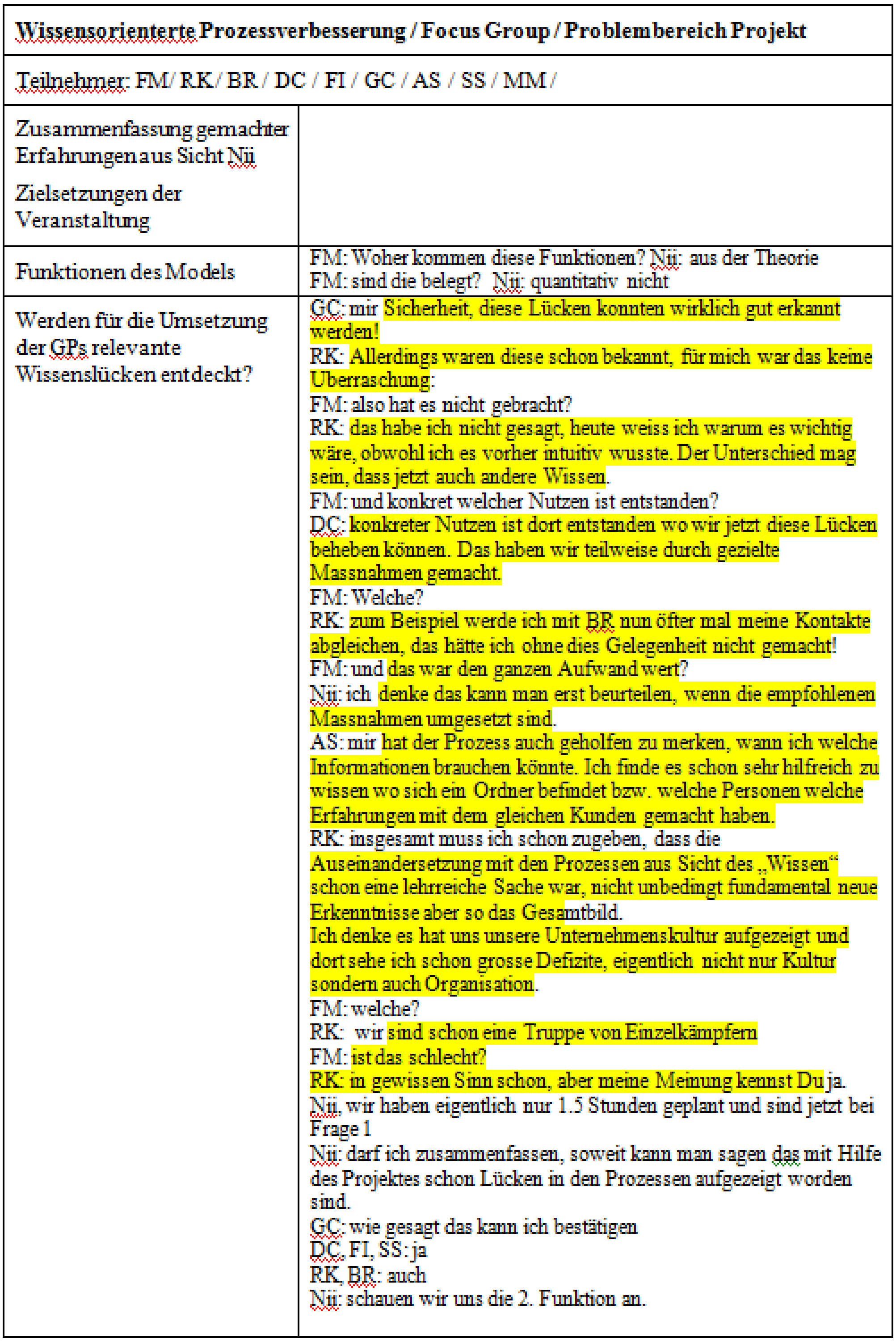
Punkt 12 Erfassen von individuellen Daten der Personen	RK: ein sehr spannender Punkt, das halte ich einerseits für die stärke aber auch für den Aufwand. Was definitiv neu ist, dass Du in GPs individuelle Eigenschaften erfasst die ohne Zweifel den GP beeinflussen. GC: also ich hatte Mühe zu sagen welche Beziehung jetzt z.B. FI zu mir hat und warum ich nicht unbedingt gerne Wisssenautausche. Allerdings sehe ich schon den Nutzen diese Sachen auf den Tisch zu legen. RK: ich denke das hast Du bisher falsch gesehen, genaus das ist die Stärke des Tools und kein Problem, Die aufwandssache ist sekundär, wenn man den Nutzen klar darlegen kann! FI: Denke sehr wichtiger OPunkt und Ansatz, genau dort unterscheidet sich dein Werkzeug von anderen Ansätzen, dass Du genau dort die menschlichen Komponenten herausholst! Nii: danke gut zu wissen!
Punkt 13 Fehlende Wissensprozesse	GC: wir haben das schon diskutiert! In der Tat ist das das Thema und das ist auch Ursache für meine Zweifel, ob nun was gemacht wird oder nicht. Nii: ok, aber Du siehst es nicht als Schwäche meines Modells? GC: ganz im Gegenteil Du hast genau aufzeigen können wo es die Unterstützung braucht und warum. Das ist der Unterschied zum breiten Ansatz, ihr müsst mal einfach Wissen teilen. Durch deinen Ansatz weiss ich nun wo und warum! Jetzt ist es meine Entscheidung, ob ich es teilen will. ich die notwendige Unterstützung einhole. RK: genaus dies ist eines der wirklich guten Ergebnisse, dass ich zum Beispiel sehe dass BR und ich doch zusammenarbeiten sollten auch wenn er dies nicht will. Er hat Angst dass ich ihm Kunden abjage und so entsteht dass Problem dass wir miteinander nicht viel Wissen austauschen. Nii: schön, dann hat es ja doch was gebracht!
Punkt 14 Detaillierungsgrad mit sehr hohem Aufwand verbunden	Nii: Den Punkt haben wir bereits durch
Punkt 15 Nutzensnachweis fehlt fürs gesamte Vorgehen	Nii: ist so kann ich aber nicht ändern! RK: das ist bei vielen Werkzeugen so!

Appendix W

Transcript from the Focus Group for Validation

The validation of the KBBPI framework was an important element in the process of developing and accessing its success. The KBBPI framework was validated by expert opinion assessing the degree to which the performance corresponds with the intended functionality and application (see Section 8.1). The notion of a validation panel, equivalent to the focus groups, was an effective technique for eliciting views and opinions, as well as allowing a topic to be investigated in depth and in a short time.

The researcher again developed a topic guide, including a short list of questions and objectives to be covered by the focus group (see Section 8.1). The data analysis followed the same rules as in earlier research steps and the results are summarised below.



Wissensorienterte Prozessverbesserung / Focus Group / Problembereich Projekt	
Teilnehmer: FM/ RK / BR / DC / FI / GC / AS / SS / MM /	
Zusammenfassung gemachter Erfahrungen aus Sicht Nii Zielsetzungen der Veranstaltung	
Funktionen des Models	FM: Woher kommen diese Funktionen? Nii: aus der Theorie FM: sind die belegt? Nii: quantitativ nicht
Werden für die Umsetzung der GPs relevante Wissenslücken entdeckt?	GC: mir Sicherheit, diese Lücken konnten wirklich gut erkannt werden! RK: Allerdings waren diese schon bekannt, für mich war das keine Uberraschung: FM: also hat es nicht gebracht? RK: das habe ich nicht gesagt, heute weiss ich warum es wichtig wäre, obwohl ich es vorher intuitiv wusste. Der Unterschied mag sein, dass jetzt auch andere Wissen. FM: und konkret welcher Nutzen ist entstanden? DC: konkreter Nutzen ist dort entstanden wo wir jetzt diese Lücken beheben können. Das haben wir teilweise durch gezielte Massnahmen gemacht. FM: Welche? RK: zum Beispiel werde ich mit BR nun öfter mal meine Kontakte abgleichen, das hätte ich ohne dies Gelegenheit nicht gemacht! FM: und das war den ganzen Aufwand wert? Nii: ich denke das kann man erst beurteilen, wenn die empfohlenen Massnahmen umgesetzt sind. AS: mir hat der Prozess auch geholfen zu merken, wann ich welche Informationen brauchen könnte. Ich finde es schon sehr hilfreich zu wissen wo sich ein Ordner befindet bzw. welche Personen welche Erfahrungen mit dem gleichen Kunden gemacht haben. RK: insgesamt muss ich schon zugeben, dass die Auseinandersetzung mit den Prozessen aus Sicht des „Wissen" schon eine lehrreiche Sache war, nicht unbedingt fundamental neue Erkenntnisse aber so das Gesamtbild. Ich denke es hat uns unsere Unternehmenskultur aufgezeigt und dort sehe ich schon grosse Defizite, eigentlich nicht nur Kultur sondern auch Organisation. FM: welche? RK: wir sind schon eine Truppe von Einzelkämpfern FM: ist das schlecht? RK: in gewissen Sinn schon, aber meine Meinung kennst Du ja. Nii, wir haben eigentlich nur 1.5 Stunden geplant und sind jetzt bei Frage 1 Nii: darf ich zusammenfassen, soweit kann man sagen das mit Hilfe des Projektes schon Lücken in den Prozessen aufgezeigt worden sind. GC: wie gesagt das kann ich bestätigen DC, FI, SS: ja RK, BR: auch Nii: schauen wir uns die 2. Funktion an.

Erlaubt das Modell die Verbesserung von Wissensprozessen?	FM: Was versteht ihr unter Wissensprozessen? Nii: Neues Wissen und Speicherung von diesem Wissen FM: und sonst nichts, da gibt es weitere! Nii: es kommt auf das Modell an, bei dem Modell dass ich verwende gibt es nur diesen beiden. Ich kann das mal bei Gelegenheit im Detail aufzeigen. FM: vestehe ich nicht ganz! Nii: Die Idee ist das bei Problemen neues Wissen generiert wird, dass heisst wenn ich den GP us Sich von Wissenslücken untersuche, so entstehen Punkte im GP, wo neue sWissen entsteht oder das Problem bestehen bleibt. Sich Wissen beschaffen ist automatisch „neues Wissen“. BR: schwierig zu sagen, ob die Prozesse verbessert wurden. Die Lücken haben wir entdeckt und ich sehe auch dass man durch die Ermittlung der Attribute dies Probleme gezielter spezifizieren kann Nii: man hat doch die Probleme nicht nur im Prozess erkannt sondern eben auch im Wissensprozess. Zum Beispiel wenn mir jemand seine Erfahrungen nicht weitergeben will, so kann ich aus der Analyse sehen dass wir unter Umstände ein Beziehungsproblem habe, gemäss der Attribute BR: ja so gesehen denke ich, dass man mit dem Modell diese verbessern kann. GC: in meinem konkreten Fall hat es sogar was konkret gebracht, ich sehe wirklich dass wir eine Ablage irgendwelcher Art haben wo jeder seine gemachten Erfahrungen hinterlegt, wie auch immer. AS: ja das würde uns allen was bringen, SS: so gesehen bin ich der Meinung dass die Wissensprozesse verbessert werden konnten. MM: ich denke schon, dass hier ein grosser Nutzen vorliegt, weil man die verschiedenen Dimensionen erfassen persönlich, Gruppe, Informationen und Wissen und entsprechend sieht wie welche Art des Wissen ausgetauscht wird, vor allem den Aspekt der Gruppen und der individuellen Ebene erachte ich als sehr spannend. RK: ja genau das haben wir letztes mal besprochen, man sieht wirklich schön bei den Auswertungen, dass bestimmte Personen oder Gruppen Probleme in dieser Hinsicht machen. FI: ja , Sachen die wir schon lange wussten, RK: nun aber aufzeigen können und auch die Zusammenhänge FM: ist schon hilfreich, wir als Berater bringen den Kunden eher selten was wirklich Neues, sondern zeigen Sachen auf die der Kunde eigentlich schon selber weiss! So ein wirkliches Aha Erlebnis ist ja sehr selten. Von daher sehe ich hier schon einen Nachweiss der Funktion. MM: prinzipiell sieht der Mechanismus vernünftig aus, was mir etwas Kopfzerbrechen macht ob die Wissensprozesse so vereinfacht werden können, soweit ich es in den Ergebnissen gesehen habe kann man irgendeine beliebige Art/Benennung der Prozesse vornehmen, das Prinzip bleibt das Gleiche. Nii: ausser wenn man nicht aus das neue Wissen achtet sondern sich nur auf das bestehende konzentriert. RK: wir sind uns einig das es so funktioniert ein konkretes Ergebnis zu erzielen. FI: ja nur ob sich der ganze Aufwand lohnt, wir haben 4 Stunden eingesetzt um herauszufinden, dass man am Projektende Wissen austauschen sollte oder am Projektanfang. Das geht auch einfacher: Nii: und wie

	Fi: man fragt Nii: nichts anderes macht das Modell, die Frage ist der detaillierungsgrad und die Frage wie weit muss etwas belegt werden. RM: s nktionalität zumindest bestätigt werden kann icherlich gibt es hier Kategorien, man erkennt Sachen die sind offensichtlich und andere wiederum die sind es weniger. Möglicherweise macht es Sinn dies zyklisch zu machen und nach dem ersten Durchlauf die einfachen Sachen nicht mehr im Detail anzuschauen. Nii: spannende Idee Können wir zusammenfassen das primär mal ohne den Aufwand zu betrachten die Fu
Lassen sich durch das Modell die Wissensmanagementprozesse verbessern bzw. das WM im Unternehmen?	FM: nochmals wie unterscheiden wir WM und WP Nii: WM sind praktisch die Umgebung für die WP, das heisst Massnahmen welche die Ausführung der WP ermöglichen. Habe das von einem Modell welches a la Porter WPs und WMs unterscheiden. FM: also die Frage stellt sich ob durch das Werkzeug klar wird was das Management tun sollte Nii: ja so kann ich bestätigen: SS: wir haben doch den Report welcher den Bedarf nach Managementunterstützung klar aufzeigt. Dort haben wir auch alle Massnahmen festgelegt entlang der von Ivan vorgeschlagenen Kategorien und soweit ich sehe sind diese vollständig und machen auch Sinn RK: ja das haben wir im Report gesehen und waren der Meinung dies ist schon nachvollziehbar. FI: hier muss ich sagen hat mir gefallen dass diese Management massnahmen sehr fokussiert sind und eben nicht ein etwas verschwommenes Massnahmenpaket wo jeder zwar nickt aber schlussendlich eben dann nichts macht, da ist dieser Ansatz schon vielversprechend. RK: da können wir schon ja, sagen FI: ohne negativ sein zu wollen es ist einfach ein Frage des Aufwandes und professionell lässt sich die Sache so nicht einsetzen, FM: warum nicht? FI: viel zu aufwendig und der Vorwurf der am Ende bleibt, das haben wir aber auch selber gewusst. Dafür muss nicht ein teurer Berater bei mir im Haus sein! Nii: das ist nachvollziehbar, dass war aber nicht Zielsetzung des Projektes. FM: für uns ist das aber ein Thema Nii sehe ich durchaus. RK: aus meiner Sicht könnte es da schon Ansätze geben allerdings hat das für mich Priorität C und nicht A. Ich denke wir kennen auf einfachere Art unser Geld verdienen und dieser Ansatz mag nur in gewissen Problemsituationen sinnvoll sein, welchen genau kann ich auch nicht sagen. FM: schauen wir uns das mal an wenn wir die Umsetzung der Massnahmen besprechen.

Konnten durch die Einführung des Modells Verbesserungen in den GPs festgestellt werden?	SS: punktuell sicherlich RK: sehe ich auch so, der grosse Wurf ist aber nicht gelungen! Nii: dafür muss man aber auch die vorgeschlagenen Massnahmen umsetzen und das ist nicht passiert. FM: von daher können wir dies Frage nicht beantworten FI: ich teile die Sicht, punktuell mag es einige Verbesserungen geben, der Nutzen ist aber nicht wirklich messbar und von daher kann ich keine Aussage über die Verbesserungen im grossen machen und schon gar nicht irgendwelchen messbaren Ansätze: FM: haben wir das erwartet? RK: nein
Wird man die Massnahmen umsetzen?	GC: dass würde mich schon interessieren? FM: ja enen teil sicherlich, die organisatorischen Probleme dürften aber sehr schwer anzugehen sein, wir können und wollen uns nicht grundsätzlich verändern und dass wir als aus vielen Einheiten bestehen welche für sich erfolgreich sein müssen ist gewollt und ich sehe auch keinen Grund hier etwas ändern zu wollen. Das heisst diese Nachteile nehme ich gerne in Kauf. RK: ich werde sicherlich in meinem Bereich bestimmte Dinge umsetzen bzw. Kleinigkeiten habe ich schon umgesetzt
Schlusswort?	RK: ich möchte für den Einsatz danke, für uns hat sich die Sache, vielleicht schon aus dem Grund gelohnt, dass wir uns mit der wichtigen Thematik auseinandergesetzt haben. So gesehen hat es uns auch einen konkreten Nutzen gebracht. Usw…….