

**Innovation in the Corporate Service
Organization and the use of Knowledge
Management across Projects**



(The Key, Jackson Pollock, 1946)

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Preface

The fact that I am currently at the office putting the finishing touches on my thesis might symbolize the whole process of writing this thesis. When I started writing 2 years ago I should have realized that I have always been very practically oriented and that choosing a subject that contains the words European Union, Russia, energy and power balance was not the wisest choice. I stubbornly continued, much to the annoyance of my boyfriend, parents and everybody else around me who'd prefer me to free up my time, save my money and stop complaining about it. The fact that I started working did not help either since this gave me the perfect excuse not to study.

About two and a half months ago I realized that I could not continue like this and that I really needed to finish this thesis. So I changed my subject to something more comprehensible and something much more close to my daily life at work. The practical experience gained from my current job has helped me write the thesis since it gave me a practical insight in the literature which made reading it much less of a hassle. It also made it easier to relate to the topic and create a logical structure. It is therefore that I am now, two months after starting on the new topic finished with this thesis.

Of course I could not have done it without the support of everybody around me. First and foremost my boyfriend who, though whilst complaining a little, always supported me in whatever I did. My parents also never stopped supporting me and neither did my brother and friends. Even if they believed me to be lazy and slow concerning this thesis, they never told me so.

So as I type these final words, I am thinking of what I should do with all the free time I now will have, probably fill the gap with working even harder, make more trips to see my friends and I might even, in a year or so do another study.

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Introduction

It has been recognized that knowledge and the effective use of knowledge enables innovation and can become an important source for sustainable competitive advantage, which is of great interest for any organization (Bresnen, Edelman, Newell, Scarbrough & Swan, 2003, p158). The challenge for every organization is how to recognize significant existing knowledge and to use and re use it when possible. Johannessen, Olaisen and Olsen (1999, p121) stress the significance of organizations having a reliable knowledge base for their competitive advantage and that innovation is key for the sustainability of this competitive advantage. Nonaka and Teece (2001, p13) agree that continuous innovation and the knowledge that facilitates that innovation is a major source for competitive advantage. They also claim that knowledge and the ability to create and use knowledge is the most important source for sustainable competitive advantage.

Knowledge can be differentiated between *explicit* and *tacit* knowledge. Explicit knowledge is knowledge that can be documented and which consists of formal models, rules and procedures. Explicit knowledge can be expressed in words and numbers and is easily communicated and shared. Johannessen et al (1999, pp128-131) add that explicit knowledge is usually unbiased and non-personal.

Tacit knowledge is explained by Hall and Andriani (2002, p31) as knowledge that is retrieved by experience and that it is not codified or communicated but learned through the sharing of experiences, observation and imitation. According to Koskinen, Pihlanto and Vanharanta (2003, p281) it usually is presented by means of metaphors, drawings and other methods of expression that do not require a formal use of language. It is therefore difficult to express in words, which makes it difficult to codify and make it available to many people.

The effectiveness of projects in organizations is widely recognized throughout literature. Projects enable organizations to achieve goals that would otherwise have been very difficult to achieve. A project environment is seen as a background for complicated processes of the development of new products and innovation (Bresnen et al, 2003, p157). Organizations use projects for the development and production of goods and services because of their variable and reliable composition. Since projects act as a secondary type of organizational form they are particularly appropriate for

learning (Schindler & Eppler, 2003, p219). To be able to identify and act upon critical knowledge is one of the major challenges of any type of project environment. This is since a successful project is dependent on accumulated knowledge on the one hand and on individual and combined skills on the other hand (Kasvi et al, 2003, p571). A project in larger organizations usually consists of a group of people from different departments who each bring a significant amount of tacit, knowledge with them. Sharing best practices and making use of real-time information sharing contributes to the performance of projects.

Capturing knowledge in projects is difficult due to the differentiation between projects, the discontinuities in employees, the different products and information that is created. The difficulty lies in the fact that the inability of developing routines, which would enable standardizing knowledge flow and that would capture learning from one project to the next. Especially difficulties of learning across projects have a major impact on organizational learning (Bresnen et al, 2003, p157). Project risk might be diminished by orderly documentation of mistakes, possible pitfalls but also good experiences and ideas (Pretorius & Steyn, 2004, p42). This would supposedly overcome the trial and error face in a new project and will most probably contribute to the innovative nature of the product or process, which should be the outcome of the project.

Within the field of knowledge management much articles and books have been written which usually deal with the theory and issues from a prescriptive point of view. The same goes for the fields of project management and innovation. One of the main critiques presented in this thesis is that these prescriptions are most often too simplistic. Concerning knowledge management, most articles usually conclude that the more knowledge an organization contains and the better it is able to manage it, the more innovative it will be. This thesis questions these functionalist views and aims to provide for a more consistent basis upon which the theory will be set.

This thesis aims to combine the varying views of authors in the knowledge management, project management and innovation field in order to answer the following research question:

How does effective use of knowledge management between projects contribute to innovation in service oriented corporate organizations?

The significance of this question lies in the fact that service oriented corporate organizations are usually mostly knowledge-based companies and make much use of projects to achieve ambitious goals.

The thesis aspires to find a connection between innovation and the effective use of knowledge management throughout projects. First it is important to understand how organizations create and manage knowledge. Chapter one will focus on knowledge and the theory of knowledge management and will define the specific characteristics and requirements for using knowledge management effectively. Chapter two will then focus on what a project is, why organizations use them and what knowledge management contributes to projects. The chapter also focuses on the reasons for project amnesia and proposes several solutions to retain knowledge learned throughout a project. The third chapter will discuss the concept of innovation and how knowledge management can influence an organization in being innovative whereas chapter four will focus on how projects can be of influence. The fifth and final chapter will link innovation through knowledge management and innovation through projects and will aim to systematically find answers to the set problem statement. The conclusion will then summarize the findings and provide for a definite answer to the research question.

Chapter 1 Knowledge Management in Service Organizations

1.1 Introduction

It has been recognized that knowledge and the effective use of knowledge enables innovation and can become an important source for sustainable competitive advantage (Nonaka & Teece, 2001, p13). How knowledge contributes to innovation will be discussed in more detail in chapter 3. First it is important to understand how organizations create and manage knowledge. This chapter will focus on knowledge and the theory of knowledge management and will define the specific characteristics and requirements for using knowledge management effectively.

1.2 What is Knowledge?

Knowledge is dynamic and is created by interactions among people and organizations. Hertog and Huizenga (2001, p25) explain that knowledge can be clarified by comparing it with the concepts data and information. Data is not synonymous with information nor is information synonymous with knowledge but they do have common relations. Data can be seen as a direct outcome of observations. The observed data will lead to information once it has been categorized and significance has been added to it. An example is data gathered from a connections system in a telecommunications company concerning the amount of new connections made throughout the year. The meaning gained from the information might be the fact that more connections are made during the months of May and June. This information can become knowledge when predictions can be made from it. Nonaka and Teece (2001, p14) argue that information needs a context to be knowledge since it is dependent on time and space. Without a context, knowledge is merely information.

Also, because of the humanistic nature of knowledge information can only become knowledge when people interpret it. In the example the prediction or context might be that people want to make more calls during spring because they will be outdoors more. The telecommunications company might thus use this knowledge to launch extra campaigns and promotions. Knowledge can thus be viewed as a collection of information and rules that could be useful when fulfilling a certain

purpose. Pretorius and Steyn (2004, pp42-43) also mention that knowledge includes the particular meaning of information given by an individual and add to the above the question as to how that information is interpreted by that particular individual. Due to the fact that knowledge is created during interactions with people and organizations it is thus dynamic. Knowledge consists of intangible assets such as the knowledge of experienced persons. The brain is the most important carrier of knowledge. Additionally, knowledge can be carried by hardware, software and documents (Hertog & Huizenga, 2001, p26).

The different type of carriers can be differentiated between *explicit* and *tacit* knowledge. Explicit knowledge is knowledge that can be documented and which consists of formal models, rules and procedures. This would evidently be the knowledge carried by hardware, software and documents. Explicit knowledge is thus mostly data and information. Koskinen, Pihlanto & Vanharanta (2003, p281) explain that explicit knowledge is the type of knowledge that is learned in school and university. It implies accurate statements about for example material properties, technical information, and tool features. Explicit knowledge can thus be expressed in words and numbers and is easily communicated and shared. Johannessen, Olsen & Olaisen (1999, pp128-131) add that explicit knowledge is usually unbiased and non-personal.

Tacit knowledge is explained by Hall and Andriani (2002, p31) as knowledge that is retrieved by experience and that it is not codified or communicated but learned through the sharing of experiences, observation and imitation. In terms of carriers, the human brain carries tacit knowledge. According to Koskinen et al (2003, p281) it usually is presented by means of metaphors, drawings and other methods of expression that do not require a formal use of language. It is therefore difficult to express in words that makes it difficult to codify and make it available to many people. Tacit knowledge is based on skills. It is rooted in the experience of individuals and consists of an individuals' beliefs and perceptions (Koskinen et al, 2003, p281) making it very people-intensive. This means that people are very important to the organization, not only as a resource but also as accumulators and producers of intangible assets (Johannessen et al, 1999, pp125-128).

Johannessen et al (1999, pp128-131) mention three more typologies of knowledge apart from tacit and explicit knowledge, namely *systemic* knowledge,

hidden knowledge and *relationship* knowledge. Organizing knowledge in a systemic way will mean to let a knowledge employee be dependent on the knowledge of other employees and of all types of knowledge technologies to make use of his own knowledge. Systemic knowledge is mutually paired and not commonly preclusive. It is a type of split understanding capability between people who share the perspective. The more uniform the perspective, the more influential it will be as to what knowledge type is vital in improving the companies' competitive position. Hidden knowledge is knowledge within a person that influences how that person thinks and act. It is how a person expresses and interprets new ideas. Relationship knowledge implies the ability to create relationships with specialized people or groups of people in order to gain access to their expertise. Figure 1 shows the typologies mentioned by Johannessen et al and includes the relative ease of communication per knowledge type and how easy or difficult it is to attain and comprehend.

	Attainable and easy to comprehend	Attainable but difficult to comprehend
Relatively easy to communicate	Explicit knowledge	Systemic knowledge
Difficult to communicate	Relationship knowledge	Tacit and hidden knowledge

Figure 1: Typology of Knowledge (Johannessen et al, 1999, p128)

For the sake of scope this thesis will further focus on explicit and tacit knowledge only. Throughout the thesis it will become clearer that knowledge management for the sake of innovation across projects is mainly dependent on tacit knowledge. As is seen in the figure this is the most difficult to attain and to communicate. Paragraph 1.4 will discuss the significance of sharing knowledge within the organization.

1.3 Knowledge Management in Organizations

Knowledge management has been defined in literature in many different ways that have varied in both scope and focus. Concerning scope, many authors describe it as an

organizational competence to preserve or improve performance based on experience and knowledge. In terms of focus, various definitions emphasize organizational procedures and practices, performance development results, networking and collaborating procedures, practices used for storing, protecting and the distribution of knowledge and tools, systems and methods used to store data (Swan & Scarbrough, 2001, p1).

Knowledge management consists of two basic strategies, which are the *codification* strategy and the *personalization* strategy. The codification strategy focuses on the actual codifying of knowledge and storing it in databases from where the knowledge can be accessed. Knowledge in the personalization strategy is coupled with individuals who develop the knowledge and share it by means of personal interaction (Kasvi, Vartiainen & Hailikari, 2003, p572). For knowledge management to be effective it should thus entail both strategies.

The first paragraph explained the concepts of tacit and explicit knowledge. It is easily assumed that explicit knowledge and the codification strategy and tacit knowledge and the personalization strategy should go together. However, the creation of knowledge happens through the interaction between tacit and explicit knowledge. This interaction is described by Nonaka and Teece (2001, p16) as *knowledge conversion*. Knowledge conversion exists out of different modes, which can be identified by the SECI process. This process exists out of:

- *Socialization* (tacit to tacit knowledge):
Knowledge can be shared by sharing experiences for example by individuals working closely together, internships, direct observation etcetera (Pretorius & Steyn, 2004, p41). Social interaction is important in sharing tacit knowledge. This is since tacit knowledge is mostly acquired through experience rather than words (Johannessen et al, 1999, p128).
- *Externalization* (tacit to explicit knowledge):
To be able to use the new knowledge it must be translated into understandable and transmissible shapes that can be communicated and understood easily throughout the organization. This verbalization of a shared mental model is called externalization (Abou-Zeid & Cheng, 2004, pp268-269). This externalization will speed up the learning, transfer-, and innovation- processes in organizations. Effectively codifying tacit knowledge depends on the benefits

received from the time and resources invested in the codification process. It can be attempted by conducting review meetings throughout a project for example. These meetings are documented continuously throughout the lifespan of a project (Pretorius & Steyn, 2004, pp46-47). Much literature focuses on the sequential use of metaphors, analogy and models to effectively externalise explicit knowledge (Nonaka & Teece, 2001, p19).

- *Combination* (explicit to explicit knowledge):

Explicit knowledge is converted into more complex and systematic sets of explicit knowledge. Explicit knowledge is gathered throughout the organization and pooled, edited or processed to shape new knowledge (Nonaka & Teece, 2001, p19).

- *Internalization* (explicit to tacit knowledge):

To create knowledge for innovation it has to be understood by all people involved (Johannessen et al, 1999, pp130-131). The embodiment of knowledge required for innovation is achieved by the internalization activity. Here, explicit knowledge is shared throughout an organization and transformed into tacit knowledge by people. The new explicit knowledge is institutionalized throughout the company for example by means of routinization (Nonaka & Teece, 2001, p19).

Achieving a balance between tacit and explicit knowledge can be a challenge for the knowledge-based organization. Always aiming to codify tacit knowledge might lead to hinder the development of both organizational routines and communities of practice (Hall & Andriani, 2002, pp32-33). Another problem might be that one or more individuals hold tacit knowledge or that it may be spread all over an organization. Most likely it will be in between these two extremes in practice. It is possible to transfer tacit knowledge by means of explication and documentation as the externalization process explains. The challenge here though is that it is most effective to transfer tacit knowledge directly between people. Many people find it preferable to attain information from a colleague than to search for it somewhere else. Koskinen et al. (2003, p285) and Kasvi et al. (2003, p574) confirm this fact. Efficient transfer though is dependent on the relationship people have and the involved trust and time that comes with that (Pretorius & Steyn, 2004, pp42-43). Another difficulty in the sharing of tacit knowledge is the fact that people need to have a shared mental model

or system. This enables people to understand each other and to accept each other's knowledge. To be able to share knowledge thus involves a shared understanding which will allow groups to understand each other and to be able to utilize another's knowledge in their own setting (Bresnen, Edelman, Newell, Scarbrough & Swan, 2003, p159). Social interaction is also an important factor in the sharing of tacit knowledge. Teams that are based in the same location seem more likely to share knowledge. Bresnen et al (2003, p159) describes the community model, which describes the significance of social networks and the creation of trust, norms and values within the community of practice. The communities of practice are in this respect constructed when people share ideas by making use collaborative mechanisms such as working together. This process provides members of the organization with an identity and consistency and through that provide for a basis for learning.

1.4 Communication in Knowledge Management

Communication is significant in knowledge transfer. This can be either communication directly by people or aided by technology. Technology is used as a medium for processing and disseminating data but there is an opposite proportionality between the used technology and the number of data communicated (Pretorius & Steyn, 2004, p42). Communication with low technology such as face-to-face communication will contain more content than high technology means of communication such as e-mail. It is important that the means of communication responds with the required type of knowledge transfer. E-mail and intranet are appropriate means for explicit knowledge while tacit knowledge is better transferred through personal meetings. The intensity of the work also influences the type of technology used since the more knowledge intensive the work is the more important low technology means of knowledge transfer becomes. This is since face-to-face communication is able to capture all types of human reaction such as ease or discomfort, which is important whilst sharing tacit knowledge.

Overall, most literature have focused on the use of Information Technology (IT) as the solution to efficiently store, search and communicate knowledge within an organization and across organizations With various types of IT such as intranet and databases and when coupled with relevant search engines, knowledge can be captured

and transferred efficiently. The main assumption in the literature is that as soon as knowledge is transferred by means of technology, various parts of the organization are able to use it for innovation and do not need to reinvent the solutions to identical problems. Much literature thus presumes that IT is the solution to the knowledge problem though the literature often tends to forget that not all organizations have the option to invest in an elaborate IT solution. Apart from the expensive initial investment for relatively new firms with a relatively small knowledge base, much established organizations already use various systems to store knowledge but have difficulties linking systems, which means that knowledge still remains dispersed over the firm. Another pitfall is for example the intranet on which much knowledge is published but often not updated or not structured enough so that it is difficult to find the necessary information. This might also lead to so-called information overload. There is so much information to find that it is virtually impossible to find the information you need.

Beyond IT and its strengths and weaknesses behind much literature about knowledge management is an information-processing model of knowledge management. This model sees knowledge as the following:

- To be stored in organizational memory;
- To be retrieved from memory and to be used as input for processing;
- To be transformed into codified forms (Swan & Scarbrough, 2001, p2).

The cognitive model emphasises on the codification of knowledge and is concerned with the retention of knowledge and how it circulates within the organization by making use of information and communication technologies. This approach can be seen as the most persistent approach in literature and is highly dependent on the availability of information-based tools (Bresnen et al, 2003, p158). Knowledge in this model is seen as input, which has to be processed by using knowledge management techniques in order to produce an innovative output. Knowledge is thus viewed as a stationary entity, which has to be stored, retrieved, translated and made available throughout the organization (Swan & Scarbrough, 2001, p2). The critique on this cognitive model is the claim that knowledge can be extracted from where it lies, which is usually in the heads of employees spread over the organization. Then the model claims that it can be codified and that it can be moved throughout the organization using IT. Apart from the possible weaknesses concerning the necessary

IT is the problem of managing tacit knowledge. The difficulty comes through the translation of tacit knowledge into explicit knowledge. Tacit knowledge is dependent upon personal beliefs, experiences, values and attitudes which implies that it will lose much of its meaning when translated. Another issue is the fact that tacit knowledge adds to the competitive advantage one organization has over another. The issue here is thus twofold: firms lose the risk of losing their competitive advantage if they were to translate all tacit knowledge but could also run the risk of losing knowledge when employees would switch firms. Hall and Andriani (2002, pp32-33) however argue that there are powerful reasons as of why tacit knowledge should be made explicit:

- To overcome vulnerability and the loss of knowledge when employees leave the company and take the knowledge with them;
- To overcome the dissemination of tacit knowledge over large number of employees who are often spread over large distances and over different departments;
- To produce standard theories and overcome the trial and error stage.
- When knowledge is systematically gathered it may benefit centralised decision-making.

Another problem with the cognitive model is the assumption that all knowledge lies with individuals whereby the model thus pays no attention to the core social configuration of knowledge. This thus disregards the shared nature and social processes of knowing. An alternative to the model is to also focus on the intangible, subjective and social processes and activities involved in the formation, understanding, and justification of knowledge. Knowledge within organizations is widely distributed and is difficult to locate and it is not extracted easily because it is embedded in various social networks and communities of practice (Swan & Scarbrough, 2001, p3). Knowledge management should thus contain a number of activities such as networking and developing social communities of practice.

1.5 Conclusion

Traditional epistemology (the theory of knowledge) has focused much attention on explicit knowledge. However, this chapter has shown that explicit and tacit

knowledge should be viewed as complementary and are both significant in the creation of knowledge within an organization. The chapter has also shown the many pitfalls organizations can fall in when not effectively managing their knowledge base. It should be clear that sharing knowledge is significant if an organization wishes to be successful and innovative. Chapter three will discuss the link between knowledge management and innovation whereas chapter two will discuss the use of projects within organizations, the impact knowledge has on these projects and how it is best to be managed.

Chapter 2 Knowledge Management in Project Environments

2.1 Introduction

Organizations use projects for the development and production of goods and services because of their variable and reliable composition. Since projects act as a secondary type of organizational form they are particularly appropriate for learning (Schindler & Eppler, 2003, p219). This chapter will focus on what a project is, why organizations use them and what knowledge management contributes to projects. The chapter also focuses on the reasons for project amnesia and proposes several solutions to retain knowledge learned throughout a project and across projects.

2.2 What is a Project?

A project environment is any organization or environment in which projects form an important part of the business. A project is a temporary activity, which is executed by a multi-disciplinary group of people who work towards one particular objective (Pretorius & Steyn, 2004, p43). Koskinen et al (2003, p281) also indicate that projects are seen as an organization of people that are committed to achieve one particular goal. They also mention that projects usually involve a limited amount of time and budget, are unique and might sometimes contain high risk. Projects also need to have clear goals and enough resources to carry out the involved tasks.

There are several possible outputs of every project. Kasvi et al (2003, p572) sum up the following:

- A (new) product or service which is delivered to an internal or external client;
- Project knowledge which is related to the product and gained through the production and use of the product or service;
- Technical knowledge about the product, its parts and its technologies;
- Knowledge about the procedures around producing and using the production and using of the product and participating in a project.
- Knowledge concerning the organization and communication and collaboration within it;

2.3 Knowledge Management in the Project Environment

Within a project, Kasvi et al (2003, p572) describe four sets of activities that are relevant for knowledge management:

1. Knowledge creation;
2. Knowledge administration;
3. Knowledge dissemination within and outside the project.
4. Knowledge utilisation (Kasvi et al, 2003, p572).

The effective use of these sets of knowledge can be a source of competitive advantage and wealth which is of great interest for any organization. To be able to identify and act upon critical knowledge is thus one of the major challenges of any type of project environment. This is because accumulated knowledge and individual and combined skills need to go hand in hand for a project to be successful (Kasvi et al, 2003, p571).

Sharing best practices and making use of real-time information sharing contributes to the performance of projects. Experiences and information gained during the project might be valuable in the same or other similar projects which could thus reduce the number of time and resources spent on the project. Project risk can thus be diminished by orderly documentation of mistakes and possible pitfalls. This is also important for all good experiences and ideas generated during a project (Pretorius & Steyn, 2004, p42). Schindler and Eppler (2003, p219) agree that retaining project experiences systematically will enable the organization to compare projects to one another and document its most successful problem solving methods. Apart from the positive outcomes of a project, lessons learned from the mistakes made and the encountered potential pitfalls might even be more valuable in the reduction of future project risk. When systematic project learning is used for a longer period of time, an organization will develop project skills. From a long term perspective, systematic project learning enables the enterprise to develop project skills that could lead to a sustainable competitive advantage.

There are many challenges for practising knowledge management in a project environment. Projects differ substantially from each other, the people involved change in a high pass as do the materials and information created. It consequently becomes difficult to develop standard routines that help maximising the flow of knowledge and

enable the capturing of learning within and across projects (Bresnen et al, 2003, p157). To overcome the barriers to effective knowledge management within projects, an organization needs to set up a set of interventions. These interventions should reflect the ways in which knowledge should be embedded within the various organizational systems and processes or be embodied within the expertise and competencies sets of individuals and groups. Within practice it is often so that this capturing of experiences gained does not take place systematically but happens mostly through formal and informal meetings with the project team or amongst its members. One main difficulty is thus the minor and entwined build up of knowledge. The created knowledge may vary in quality and content as does the ability of the organization to put the created knowledge to good use (Kasvi et al 2003, p572).

2.4 Knowledge Conversion in Projects

Every team member within a project has three types of competence, namely explicit knowledge, tacit knowledge and personal characteristics (Koskinen et al, 2003, p281). Within existing literature the main focus within project management is on applying explicit knowledge (Bresnen et al, 2003, p157; Schindler et al, 2003, p220). Management of results of applying tacit knowledge is attempted by making use of reviews, project debriefings, closure procedures and other knowledge arsenals (Koskinen et al, 2003, p285). The problem with project documentation such as feasibility studies, summaries and user manuals is that they are often on the surface and usually focus solely on the description of the project results and on capturing channelled business data. Special issues such as efficient answers to problems or records of reasons for failure are not included in this type of documentation (Schindler & Eppler, 2003, p219). Codified tacit knowledge is generally not part of project documentation and is typically not transferred to other people or projects throughout a project. After the completion of the project, members will return to their normal functions and take the newly learned project experiences with them. These skills are thus only accessible via informal networks and if their knowledge is not used within a short period of time, organizational amnesia will begin (Schindler & Eppler, 2003, p219). Throughout literature the codification of knowledge within projects is limited to the requirement that the experiences gained are captured at the end of a project.

How the capturing can be accomplished and how it should be communicated within the organization is typically not discussed other than by the above mentioned methods (Schindler & Eppler, 2003, p220).

Concerning knowledge in the project environment, tacit knowledge is often not adequately understood. The fact that a great amount of knowledge is required is usually not taken into account. The fact that projects are limited to time is also not always taken into consideration (Koskinen et al, 2003, p281). Schindler and Eppler (2003, p221) found that reasons for project amnesia are all related to four criteria, namely (lack of) time, motivation, discipline and skills. In the cases where project teams do aim to gather experiences the same lack of these four criteria lead to ineffectiveness of the data gathered. As chapter one has shown, aspects that can block gaining tacit knowledge are the lack of trust, differences in culture, be it international differences or interdepartmental differences and lack of physical proximity (Koskinen et al, 2003, p289). Within projects one of the main difficulties for building a trustful relationship is the limited time span (Pretorius & Steyn, 2004, pp42-43). Trust can be gained by working in one physical environment. It often happen that the people involved in a project are geographically spread and since projects have a limited character, the involved people and all the knowledge they have gained during the project are dispersed. Another limitation of geographical spread is that team members will most often communicate through means like electronic mail. This makes the transfer of tacit knowledge among team members difficult since too much information and detail would hinder effective communication (Koskinen et al, 2003, p288). This loss of opportunity is even more apparent in multi-disciplinary teams since the teams consist of a range of people who all have different skills and knowledge and are used to different processes, culture and practices (Pretorius & Steyn, 2004, pp42-43). The fact that projects are limited in time and resources and contain changing people and multi-disciplinary processes poses more problems regarding knowledge management. Usually project members are too occupied with project tasks and often tasks of their own functions that they do not have the time to codify knowledge or participate in knowledge sharing activities (Pretorius & Steyn, 2004, p42). It thus often happens that project knowledge is not captured and shared and will thus disperse with the termination of the project. Another problem is the fact that people often change during

a project. This results in the fragmentation of organizational knowledge and the loss of organizational learning (Kasvi et al, 2003, p572).

In order to solve the above problems, Pretorius and Steyn (2004, p46) propose several factors that could influence a positive culture for the sharing and transfer of knowledge. These factors are:

1. The physical environment. Teams that are in the same physical environments are able to share and transfer knowledge more easily since co-location encourages informal interaction between the team members;
2. Tenure of the project team. Sharing and transferring knowledge is enhanced when people in a project know and trust each other which is something that can be formed by working together for a considerable amount of time;
3. Size of the project teams: The smaller the team, the more likely it will be to share knowledge.

Other factors that influence the culture of knowledge sharing are the use of measures such as training and mentorship (Pretorius & Steyn, 2004, p46).

2.5 Managing Knowledge for Project Management

Pretorius and Steyn (2004, p43) have used existing literature on knowledge management to develop a framework for knowledge management in project environments a copy of which is shown in figure 2. In the diagram, *italics* show where project management overlaps with knowledge management and **boldface** shows areas of concern for project management according to Pretorius and Steyn.

According to the figure there are characteristics of project environments that are consistent with, or could even enhance, characteristics in knowledge management. This would imply that knowledge is managed automatically in project environments. The overlapping characteristics include:

- Documents are created by using standard working procedures;
- One person is responsible for the assembly of meetings, reviews, problem solving issues etcetera;
- The results of explicit and often the results of tacit knowledge are documented as minutes of meetings during the project life cycle, and at project close-out (Pretorius & Steyn, 2004, p43).

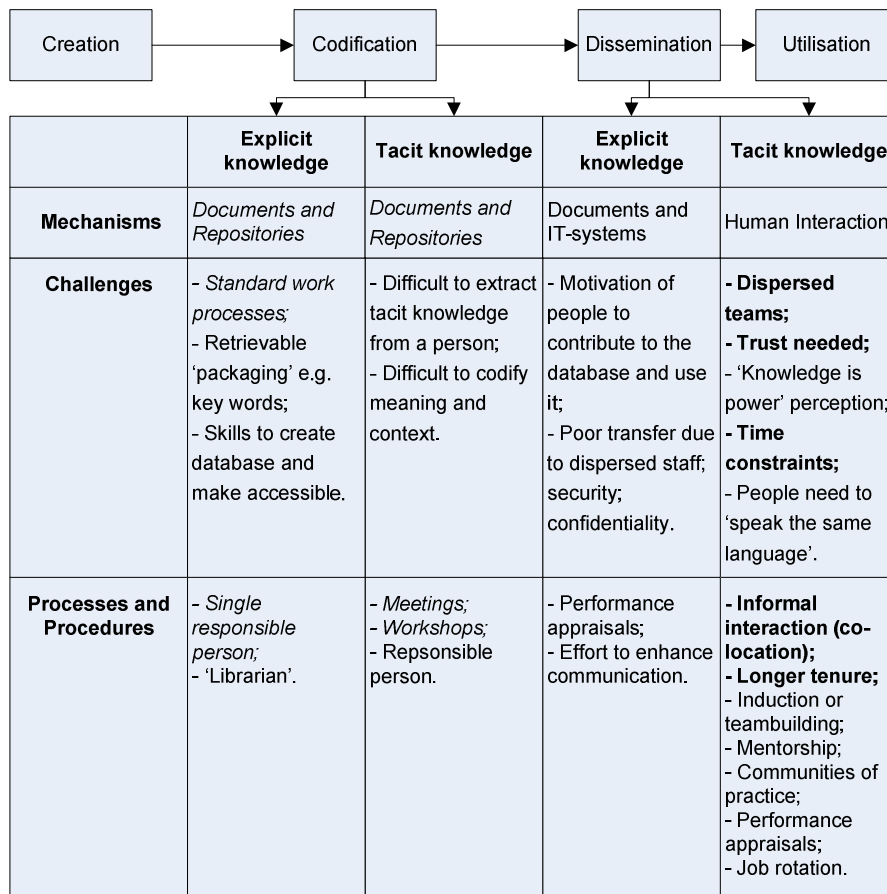


Figure 2: Framework for Knowledge Management (Pretorius & Steyn, 2004, p44)

Pretorius and Steyn (2004, p47) argue that knowledge is, to an extent, automatically managed within projects. This is since projects include meetings, workshops, documentation and the distribution of this documentation. This thus represents the codification strategy within knowledge management. The personalization strategy is not as simple according to the authors, which complies with the obstacle mentioned in paragraph 2.4. The reason they mention is the limited contact project team members have which diminishes the trust relationship between them and thus loses a key aspect important to transfer tacit knowledge. Pretorius and Steyn (2004, p47) claim that one specific person should be responsible for the management of all knowledge within a project. The project manager should expand its duties to the preparation and systematic distribution of codified knowledge. The

project manager should also be responsible for the effective sharing of this knowledge throughout the team.

Another method that can be used in order to make knowledge sharing as simple as possible is to know upfront what type of project it is going to be and to apply resources accordingly. Projects that have unclear goals at the beginning as well as unclear resources and procedures are for example research- or design projects. It can thus be concluded that this type of project will require much use of the tacit knowledge of its members. Projects with defined goals, means and methods will most probably be able to make the most out of explicit knowledge (Koskinen et al, 2003, p282).

2.6 Knowledge Management across Projects

Paragraph 2.5 provided for some solutions to the difficulty with knowledge management within a project. This paragraph will focus on learning across projects. Problems of learning across projects have deeper implications for processes of organizational learning. This implies that effective learning across projects also have more potential to develop into a source of competitive advantage for organizations. Effective interproject knowledge management can add to the competitiveness and profitability of an organization. The methodical preservation of project experiences can also enable an organization to compare projects to one another and focus on the most effective problem solving methods (Schindler et al, 2003, p219).

Since projects are solitary, limited in time and unique, constraints on learning across projects include the effective capturing of knowledge within projects and the effectively distribution and communication of the knowledge. The flow of resources from one project to the next provide for unavoidable intermittencies. One of the consequences of this flow is that many projects have to 'reinvent the wheel' when faced with a problem. Even when another project team has already solved the same type of problem, this project team now face the same issue and all the costs involved (Bresnen et al, 2003, p158).

The first chapter explained tacit knowledge and the importance of developing a shared meaning and understandings. Within the project environment and with learning across projects however, one of the main challenges is not only to make tacit

knowledge explicit but to figure out how social routines are structured and how to align with them (Bresnen et al, 2003, p159).

Within an organization, projects are treated as disconnected units and very little contact exists between project managers or members. Often, no effort is made to manage accumulated knowledge learned by project managers and project members. Trust is also not developed due to little interaction between project managers. This results in a negative culture and stimulates people to move away from the organization. This latter can be tackled by creating an environment for project managers where they are able to share knowledge and experience and through that add to organizational learning (Pretorius & Steyn, 2004, p 47).

Schindler and Eppler (2003, p226) argue that it is significant that every project has two separate goals. The first of which is to successfully develop the product or service and the second is to advance the learning of the company. Practically they say that at the start of a project the learning and knowledge goals should be in place at the micro level but that these goals should also correspond with the underlying organizational goals.

Kasvi et al (2003, p580) also propose a possible approach to utilize effective knowledge management across projects. Figure 3 shows the first step of this approach. To systematically manage knowledge created in a project it is important that the projects are systematically managed themselves. Kasvi et al (2003, p580) propose a model to systematically manage projects (Figure 3). This *project learning model* shows that a systematic repetition of workshops will update two dynamic working project documents. The authors name these documents the project plan and the team contract. When both these documents are managed systematically, projects will learn. The problem with the model is however that people do not always have the time or the motivation to fill in these documents or have time or motivation to attend the workshops and assessments required to fill them in. People and departments often need personal benefit in order to contribute time and resources. They are therefore often not willing to invest time in documents and resources at the end of a project.

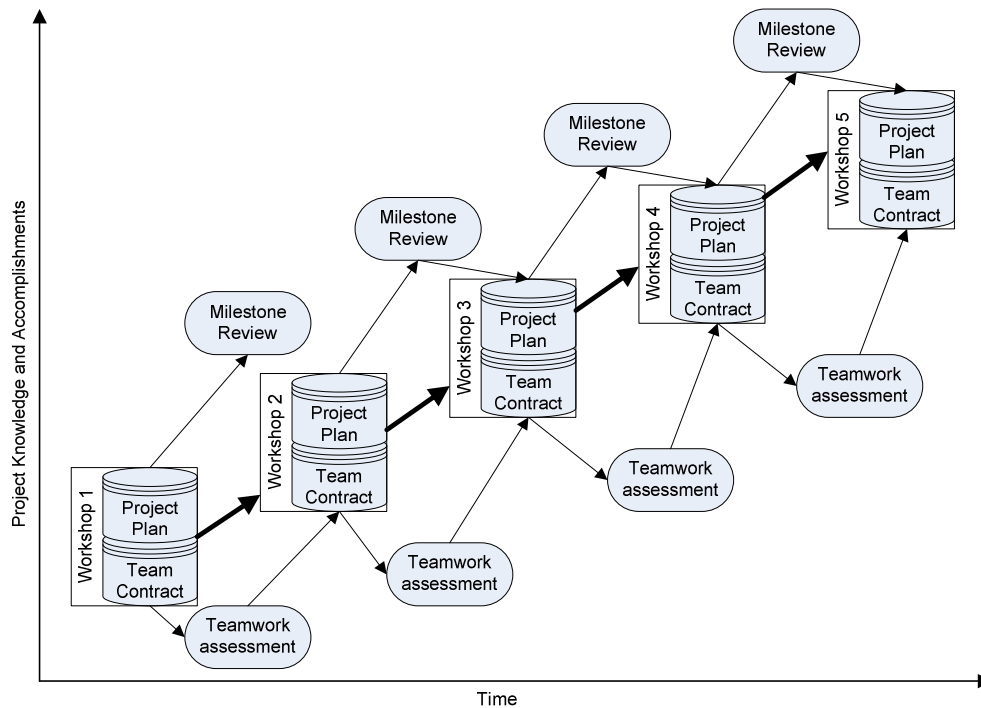
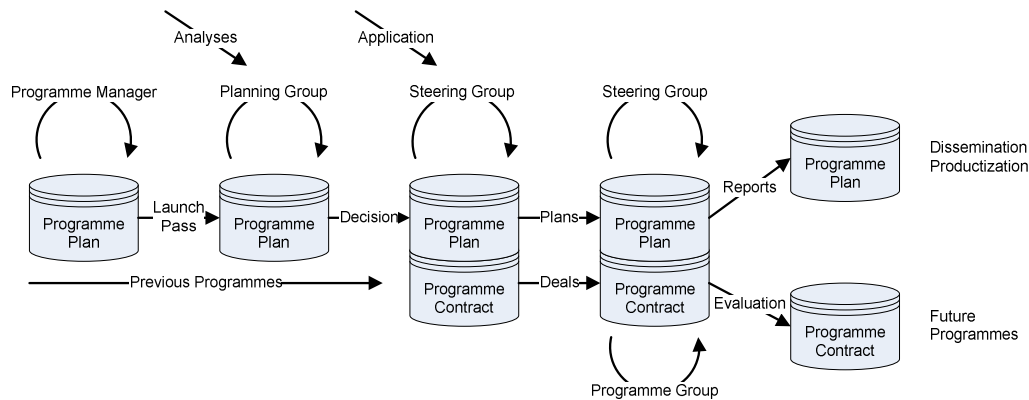


Figure 3: Project Learning Model (Kasvi et al, 2003, p580)

Kasvi et al (2003, p581) also propose that when the project learning model will be in effect and effective, the knowledge gained can be transferred to other projects. This is shown by the *learning programme model* in figure 4. For the learning programme model to be effective the learning project model should cover the entire programme. In the model the programme plan will contain mainly explicit knowledge on programme goals and results. The programme contract will contain both explicit and codified tacit knowledge on processes, organizational concerns and lessons learned throughout the programme. The dynamic model thus aims to create a programme memory. The model is dependent on the organization's ability to define those key documents and processes that indeed transfer the knowledge that is essential from one programme stage to another.



The model also assumes that the project learning model is effective and is easily transferred to the programme model. For the models to work in a large organization with many parallel projects a separate programme and project department will need to be established. With top-level sponsorship this department can ensure that the requirement documentation is obtained. This department will also have a pragmatic view of the projects and ensure and communicated when necessary. Pretorius and Steyn (2004, p48) also mention that there should be one specific person or department responsible for knowledge management between projects. This person should set up processes that will facilitate socialization, codification and informal social interaction. This could help develop communities of practice amongst project managers that will stimulate the transfer of tacit knowledge. Accordingly, Schindler and Eppler (2003, p219) mention that a *project debriefer* should be identified who will organize and enable review workshops and who will manage the documentation of workshop results. This debriefer will take the position of an autonomous, impartial arbitrator who encourages dialogue in a collective team debriefing and aims to find critical key learnings.

2.7 Conclusion

The risk of knowledge loss at the end of a project is a serious problem for organizations, especially in knowledge-intensive markets such as the service industry. Organizations have the opportunity to save substantial costs, which would result from

resolving of issues and the repetition of mistakes if they learn how to manage knowledge effectively within and across projects. The chapter has shown several possible solutions to the knowledge problem but concludes that neither of these solutions will be of use in the transfer of knowledge. This guidance can be of one person in the smaller organization or a knowledge department within the corporate organization. This person or department will then ensure sufficient communication throughout a project and across projects. When making use of dynamic knowledge documents, the organization can build a substantial knowledge base that can then be transferred from one project to the next. It is vital though that company culture supports knowledge sharing. They can do this by establishing such a knowledge department but also by creating a culture that will stimulate the sharing of knowledge.

Chapter 3 Innovation and Knowledge Management

3.1 Introduction

This chapter aims to identify and understand the concept and reasons behind innovation and how knowledge is managed to drive this innovation. One paragraph will be devoted to innovation in the services industry since this can be significantly different from innovation in for example a manufacturing company. The main aim of the chapter is to introduce the concepts of knowledge-based innovation and the tools of managing knowledge in the competitive service industry.

3.2 What is Knowledge-Based Innovation?

Johannessen et al (1999, p121) stress the significance of having a reliable knowledge base for the competitive advantage of an organization and that innovation is key for the sustainability of this competitive advantage. Gopalakrishnan & Bierly (2001, pp108-109) mention that understanding how knowledge flows through an organization is critical in order to improve organizational processes and through that products and services. Nonaka and Teece (2001, p13) agree that continuous innovation and the knowledge that facilitates that innovation is a major source for competitive advantage. They claim that knowledge and the ability to create and use knowledge are the main facilitators of this possibly sustainable competitive advantage.

The term innovation can be explained whilst comparing it with the term invention. Whereas invention deals only with the creative aspect of a new product or service, innovation incorporates the creation, development and marketing of new products or services (Oke, 2003, p32). Innovation is applying knowledge in order to produce new knowledge. As mentioned above, making better use of existing knowledge and creating new knowledge is vital in business today. A main reason for this is *hyper competition*, which is a situation in which short periods of advantage are interrupted by frequent distractions (Johannessen et al, 1999, p121). The states of hyper competition many industries and organizations are now in have emphasized the importance of being innovative (Abou-Zeid & Cheng, 2004, p261). This is since the

creation and marketing of new products and services enable firms to create competitive advantages. The alteration in the state of knowledge creates new states of imbalance and therefore new opportunities to create profit. Gopalakrishnan & Bierly (2001, pp108-109) also mention that managing an organization's knowledge base is especially vital in a hyper competitive market since there are more technological changes and since organizational boundaries become blurred. It is therefore vital that organizations remain flexible and ensure that their competitive advantages are mostly based on their efficiency of knowledge integration. The need for a knowledge-based company is therefore emphasized. The market is kept in continuous motion by this stream of knowledge and ensures that organizations execute continuous improvements and innovation. The organizations that can turn their innovation into knowledge will have a greater advantage in discovering market inefficiencies which will give them a better position to be innovative.

Throughout literature there have been two views on innovation, namely the product-oriented and the process-oriented view. In the first perspective, innovation is viewed as a distinct product or outcome while the process-oriented view sees innovation as the process of the introduction of something new (Abou-Zeid & Cheng, 2004, pp261-262). The process-oriented perspective on innovation sees innovation as a complex design and decision process involving the distribution, implementation and use of new ideas (Swan & Scarbrough, 2001, p3). Abou-Zeid and Cheng, (2004, p262) agree that the product-oriented and process-oriented approaches are helpful in understanding the relationship between knowledge management and innovation but they claim that these studies have failed to acknowledge the impact of the relationship on the effectiveness of the innovation process. The authors argue that classifying innovations according to the type of knowledge associated with the innovation should be linked to the typologies of innovation. Categories in which the outcomes of innovation can be placed differ in various criteria. The main criteria include the objective of innovation outcomes (product versus process), the area of impact (technical versus administrative), and the level of change (radical versus incremental) (Abou-Zeid & Cheng, 2004, pp262-263). The difference between administrative and technical innovations commonly reflects a general difference between social structure and technology. Technical innovations include products, processes and technologies used to produce new products or deliver services that are linked to the central activity.

Administrative innovations are linked to organizational structures and administrative processes and are more related to the management of the organization. Product and process innovations are differentiated based on the affected areas and activities within the organization. Product innovations are outputs or services that are initiated for the customer whereas process innovations are usually tools, systems and knowledge in throughput technology that arbitrate between inputs and outputs. It is also possible that a process innovation is a new or improved process itself. Product innovations usually occur earlier in the product life cycle while process innovations tend to occur later. Also, product innovations are commonly aligned with a differentiation strategy while process innovations support the successful implementation of a low-cost strategy or aid in decreasing operational expenditure throughout the life cycle. The differentiation between radical and incremental innovation is based on the level of change an innovation cause to the structure and processes of a company. Radical innovations usually produce fundamental changes in the actions of an organization and produce a different approach to existing practices. Incremental innovations only produce a marginal difference in approach to existing products and processes and are usually aimed to reinforce the organizations existing capabilities (Gopalakrishnan & Bierly, 2001, pp108-109). Gallouj and Weinstein (1997, p539) mention that innovations can be categorized according to whether they relate to function, specification or production. When innovation is related to function, this includes the emergence of new, undifferentiated, conceptual functions. Specification involves the actual realisation and differentiation of the functional innovation whereas production corresponds to a cost-saving strategy. The typologies and the relational aspects do explain the concept of innovation but neither one address the knowledge required for innovation.

3.3 The Innovation Process

There exist two stages in the innovation process, namely generation and adoption. The generation stage is defined in terms of the problem solving and decision making involved when developing new products or processes. The adoption phase however refers to the process of the actual creation of the products, processes or practices into an organization. This stage model is helpful in understanding the dynamics of the

innovation process but is limited concerning the knowledge concerned with every stage.

To create better insight into the nature of knowledge associated with innovation, one must first discuss the characteristics of the innovation process. One key characteristic of the process is *newness* or *novelty*. This is used to recognize the outcome of the process. One can see innovation as the process of creating something new (Abou-Zeid & Cheng, 2004, pp265-266). Beckenbach and Daskalakis (2003, p3) claim that this *novelty creating process* can be seen as a *creative problem-solving* activity. The characteristics include an ill-defined problem, and includes that the explorations of problems and solutions happen simultaneously. Three factors influence ill-defined business problems. The first is a meagre understanding of the situation and the difficulty of how to transform this into a mental representation. The second is not having a suitable order of activities that is required to change the first situation to the wanted one. The third is not having a clear view of the desired situation.

Beckenbach and Daskalakis (2003, p3) mention two stages in the creative problem solving for novelty creation, namely: *invention* and *innovation*. Invention is the formation of ideas or concepts which should be applied to the business. This is based on the tacit knowledge of individuals. Innovation is the process of using the new knowledge created in the invention stage to enact it in a number of forms. Tranfield, Young and Partington (2003, p28) describe innovation as a central renewal process within an organization. The authors argue that it is essential to always look for ways to change or improve products and services offered or improve the creation and the deliverance of these products and services in order to avoid the risks involved in the hostile market many companies operate in. They also found several issues related to understanding the basic and firm-specific concerns surrounding the trouble of dealing with constant innovation:

- Organizations need to be ready for innovation;
- Managers need to understand innovation and how this operates as a process;
- Organizations need to develop several innovation projects ranging from incremental to radical innovation;
- When creating a strategic range of innovative projects, organizations need to keep knowledge concerning technologies, products, markets, etcetera in mind. It is also

vital that they consider how to mobilise this knowledge to generate advantage through innovation.

A key management task is therefore to enable and manage the knowledge creation and exploitation processes associated with any type of innovation.

As explained in paragraph 3.2, in the process-oriented view, innovation is portrayed as a set of recursive and overlapping periods that move from initial consciousness of new ideas to the selection of some of these ideas and through to implementation. If the implementation is successful, the new ideas will be used in the form of new products, services or organizational processes. The first period is agenda formation and concerns the growth of consciousness of new ideas. Selection is then the next period and relates to the further processing and promotion of new ideas in order to ensure the further development of them since they might be the solution to problems the organization is facing. The implementation period describes the process of introducing the ideas to the organization and relating the ideas to the context in the form of new products, services, technologies or processes. The final period is routinization which describes the situation in which the innovation becomes embedded in the day to day organizational routines and becomes a standard of working. The periods are not necessarily distinct stages though. The periods can rather be seen as iterative, overlapping and conflated (Swan & Scarbrough, 2001, p3).

3.4 Innovation for Services

A service can be described as the solution to a problem which does not necessarily imply the supply of a physical good. A service can be seen as a bundle of human, technological or organizational capacities that is put at the disposal of a customer. The term service allows for a differentiation between highly standardized and more customized services. These more customized services are mostly based on tacit knowledge (Den Hertog, 2000, p4).

Den Hertog (2000, p3) has recognized two significant results from studies in the field of services innovation. Firstly it has been recognized that services do indeed have a role to the innovation process. Secondly, it has been acknowledged that technological innovation has been moderated by the recognition of non-technical elements of service innovation. There now exists a better understanding of the

characteristics of services. The innovation of services can be seen as new developments in those activities that deliver the core product (Oke, 2003, p38). The development of a new service is according to Oke (2003, p31) far more complex than the development of a tangible product. Service innovation usually corresponds with new ways of distributing products, interaction with customers, quality control etcetera. There are differences though in the introduction of a completely new service and the offering an existing service through a different distribution channel for example. Practically, most innovations are a mixture of major and minor modifications and adjustments of existing service products (Den Hertog, 2000, p3).

The characteristics of services have an effect on the use and creation of knowledge within an organization. The creation of new services is characterised by high intangibilities due to skewed information, product segregation and changing scale economies. There thus exists a high level of uncertainty in innovative organizations (Miozzo & Ramirez, 2003, p63).

3.5 Tacit knowledge and Innovation

Tacit knowledge might act as a source for the creation of new knowledge and continuous innovation (Johannessen et al, 1999, p127). An innovation includes both tacit as explicit areas. Because of the difficulty in codifying tacit knowledge, adopting innovations that are based more on tacit knowledge is challenging. This is also caused by the difficulty in transferring learning from one innovation decision situation to another. This thus makes the implementation process compared to explicit innovation more complex to manage and more costly. Also, it is more difficult to integrate tacit innovation in other knowledge areas because of the difficulty of transferring knowledge across communities of practice (Gopalakrishnan & Bierly, 2001, pp110-112). This will be further discussed in chapter five. Successfully implemented tacit innovations though are more valuable in creating a sustainable competitive advantage, because they are more difficult to imitate by competition. It is because of the difficulty codifying tacit knowledge that it is so unique and difficult to copy by the competition (Gopalakrishnan & Bierly, 2001, pp123-126). This is a major dilemma that organizations face, namely to be better able to communicate and manage knowledge within the company or stand a better chance in the market with tacit

knowledge. This dilemma will also be discussed in chapter five. The tacitness and inter-relatedness of an innovation is closely related to the complexity of an innovation, which means the degree of difficulty in understanding or using an innovation.

3.6 Managing knowledge for innovation

Yang (2005, p121) confirms the common opinion that knowledge management is the basic structure of a successful company and that it creates a significant potential in obtaining competitive advantage. Firm performance is developed through the efficient development of the intellectual property that is a source for competitive advantage.

As already discussed in chapter one, much literature focuses on the extraction, codification and diffusion of explicit knowledge through the use of IT-based tools. This focus is more on the spreading of explicit knowledge that is useful for the transfer of already developed and understood ideas and thus able to be codified. For innovation however, the periods of selection and implementation require explicit knowledge to be reinterpreted, recreated and appropriated together with local and contextual tacit knowledge about organizational processes. The periods thus require those people who have the relevant tacit knowledge and skills to work together and locally recreate and apply transferred information in new and fitting ways. Problems here include:

- Engaging the right people with the necessary tacit knowledge,
- The development of social cultures and communities of practice;
- The creation of new social and business implications and understandings;
- The politics of decision-making and change (Swan & Scarbrough, 2001, p4).

Explicit and tacit knowledge thus need to be combined in the selection and implementation periods. Blazevic and Lievens (2004, p375) agree by mentioning that organizational learning is in between social culture and climate and various outcomes such as customer satisfaction and new product development. IT-based tools thus play only a limited role. Yang (2005, p123) elaborates by saying that knowledge integration and innovation are often forgotten in innovation literature. Yang explored how performance-driven strategy and knowledge management based competence arbitrate the connection between knowledge management strategy and strategic

performance. Performance-driven strategy is divided into two aspects namely the reward system and process innovation. Likewise, knowledge management-based competence includes the integration of knowledge from past projects and organizational learnings into research and development. The results from the study suggest that the reward system, process innovation, and intra-organizational sharing improve the effectiveness of the knowledge management strategy of innovative organizations. This is consistent with the findings from chapters one and two of this thesis.

Knowledge integration and innovation within the knowledge management process are an important part of the development of new products (Yang, 2005, p121). Integration of knowledge is a key process through which organizations are able to obtain the benefits of knowledge and create competitive advantage. Knowledge integration can be achieved simply through the collaboration of people. Concerning the performance of new products, knowledge integration is dependent on how people are able to integrate their individual knowledge within their company. Improving the group process might thus achieve better knowledge integration (Yang, 2005, p122). There are two main dimensions of knowledge innovation. The first dimension is the conversion of tacit knowledge into explicit knowledge as extensively explained in chapter two and is a key process in the creation of new knowledge according to Yang (2005, p123). The other dimension is the knowledge-creating entities including persons, teams, and organization. These entities are very important in knowledge innovation.

Yang (2005, p122) specifies three different categories of knowledge that are used in the new product development process: general, domain specific and procedural. General knowledge is the knowledge that persons gain throughout their everyday experiences and apply without consideration to the context. Domain specific knowledge is gained through study and experience within a specific context. This is usually improved when the person gains more experience in this context. Procedural knowledge is suggested to be a combination of both general and domain specific knowledge. Concerning innovation this includes knowledge about the process through which new product development is enabled. Integration of knowledge within the organization is the process of translating the untreated knowledge into actionable knowledge by understanding the business context.

It is apparent that knowledge is significant for innovation. Much literature tends to assume that knowledge management and innovation are linked through a direct functional relationship. When this is linked to knowledge management, they propose that different characteristics of innovation may need different requirements for knowledge management. Organizational innovation is a process involving several players, types of knowledge and organizational responsibilities. Effectively using knowledge is critical for the innovation process. Swan and Scarbrough (2000, p1) mention that because the innovation process is very complex, it is not possible to find one best practice approach for knowledge management. As this process consists of different periods, Swan and Scarbrough (2001, p2) argue that the type of knowledge used is contingent on the period in the innovation process and the context surrounding that process. All periods interrelate and involve the development, sharing and application of knowledge. The knowledge management practices that need to be applied will thus vary across the different periods in the innovation process. The authors have identified knowledge activities that support each period namely: *knowledge acquisition, knowledge creation and appropriation, and knowledge capture and storage*. For example agenda formation is more concerned with acquiring knowledge, whereas selection and implementation are concerned with the application of knowledge to particular circumstances. Each period thus poses various challenges for knowledge management.

The development of new products or services is a complicated innovation process which requires the use of both explicit and tacit knowledge in order to create and apply something new (Yang, 2005, p123). When the innovation has been implemented the main aim will thus be to ensure that the new knowledge is captured, stored and made into a routine. At this point the knowledge thus needs to be made explicit and exploited fully. This period will thus emphasize on codifying knowledge so that standard processes and practices can be followed.

3.7 Conclusion

Organizations that are able to press forward their own businesses, leverage their internal knowledge and at the same time think outside their current procedures are likely to do well in the innovative market. This chapter has also shown that it is not so

much an organization's size or position or its depth of knowledge that determines an organizations advantage but rather its skills to react and lead in a changing environment. The fifth chapter will use the methods to manage knowledge for innovation an apply these to the project environment. The following chapter will first discuss the use of projects in the innovative market.

Chapter 4 Service Innovation through Projects

4.1 Introduction

The various changes in the market such as deregulation, globalization and the internationalization of organizations have made competition between organizations extremely fierce. This has placed service innovation at the centre of the organization's competitiveness in order to adapt to the turbulent environment. This chapter will discuss the concept of service innovation in relation to projects. It will especially focus on what characterizes service innovations and how projects should be managed accordingly. First the characteristics of a project driven service innovation will be described. A paragraph will be devoted to the use of knowledge and learning in service innovation and the final paragraph will subsequently focus on how the effective use of project management can contribute to innovation.

4.2 Project Driven Service Innovation

Most service organizations in the competitive market are characterized by four features.

1. Products are information-, service- and knowledge-intensive;
2. The environment is dynamic;
3. The choices are complex and organizations need to consider many aspects;
4. The quality of customer service is a critical success factor.

To be competitive in the market as a service organization it is vital that all different functional units work together and that cross-functional interfaces are established. This stimulates the spread of knowledge and organizational learning (Blazevic & Lievens, 2004, p385) and it can be argued that being able to learn as an organization is a competitive advantage. This will be further discussed in chapter five. Also because of the process intensiveness of most service firms it is important that different areas of expertise are established in the various functional units that can be integrated via cross-functional interfaces. This ensures the necessary shared interpretation of project members across departments (Blazevic & Lievens, 2004, p386).

The development of new services thus relies on different success factors than the development of new products. This is mainly due to the specific characteristics of services including the intangibility, perishability of services and the required customer interaction. For projects working on new service development Blindenbach-Driessen and van den Ende, (2006, p547) mention several important factors:

- To have a distinct and reliable concept for the service;
- Synergy with the core business of the organization;
- Support of senior management;
- Customer involvement;
- Cross-functional teams.

They also mention that having a structured approach to the development of a new service is less important than in the development of a new tangible product. Blazevic and Lievens (2004, p385) agree that management support is very important for the new service development process. They believe that management should support the exchange of knowledge within and across projects. The motivation of innovation project team members should thus increase and should enhance information processing activities which in turn will positively benefit innovation itself. The authors also emphasize the use of cross-functional teams to stimulate the spread of knowledge and through that innovation.

Brady and Davies (2004, p1604) argue that the competitiveness of organizations depends on three sets of capabilities. The two capabilities that have been recognized in the literature are the strategic capability and the functional capability. Strategic capabilities are required to monitor internal processes and regulate strategies to a changing environment. Functional capabilities organized in departments are required to produce high volumes of standardized products and services. Brady and Davies (2004, p1604) have introduced project capabilities to refer to the most important activities of an organization that designs and produces new products and services. Project capabilities should have the following requirements:

- Engage with their customers in strategic product or service development activities;
- Prepare proposals for these products or services;
- Manage the life cycle activities that are involved in the implementation of the project, the handover to the customer, and ongoing support.

4.3 Knowledge, Learning and Service Innovation

Innovation within the organization involves a multifaceted and repetitive set of contacts between various departments, social sub-groups, agendas and types of knowledge (Swan & Scarbrough, 2001, p3). Stevens and Dimitriadis (2005, p191) introduce the term *interactors* in their model for both individuals and groups (see figure 5). They argue that the process of new service development and organizational learning is made up of interactions. The term refers to the actors who create knowledge through constant interaction with each other. The amount of interactors and their functions will determine the relation between the new service and the customer's requirements. This adds to the concept of *organizational diversity* which is an important asset that will facilitate organizational learning and through that innovation in the project-based firm. It is defined as the number of experts in an organization and their respective professionalism. This heterogeneity enables the stimulation of new ideas for the project teams and can give the experts new insight through different perspectives. Swan and Scarbrough (2001, p8) agree that sharing knowledge across functional or organizational borders by making use of cross-functional and inter-organizational teams can be seen as key to the successful use of knowledge for innovation. Yang (2005, p122) also mentions that since knowledge can not be created without individuals it is vital that the organization supports creative individuals and ensures a context for them in order to create knowledge. Yang (2005, p122) therefore sees organizational knowledge innovation as a process of knowledge being created by individuals and enhanced as part of the organizational knowledge network. It is therefore important that new service development involves cross-departmental functioning. This implies people from different departments who form a team with different viewpoints. When developing a knowledge-management strategy the organization thus has to focus on the development of social communities (Swan & Scarbrough, 2001, p8). A community of practice can be defined as a system of activity about which members share understandings concerning what they are doing and what that implies for their jobs and community (Ardichvilli, Maurer, Li, Wentling & Steudemann, 2006, p95). This ensures the establishment of shared values, trust and understanding that are essential for creating and applying knowledge. The role of IT

should be seen as coming in second place. This has been thoroughly explained in chapter one. As was explained there, project teams, thus also innovation project teams, will benefit more from face-to-face interaction and dialogue than from IT solutions. The model of Stevens and Dimitriadis (2005, p191) does however claim that the technical devices that contribute to the process of interaction such as IT systems and infrastructures do contribute though.

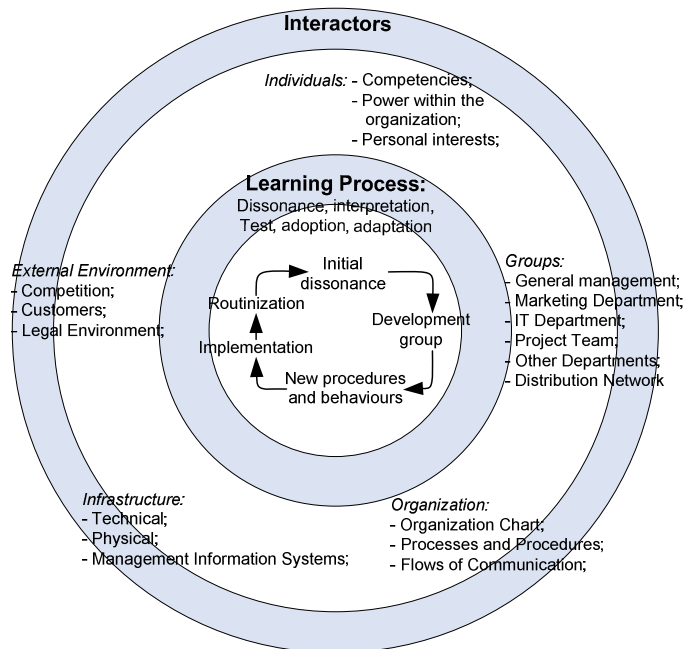


Figure 5: The systemic learning model for new service development (Steven & Dimitriadis, 2005, p191)

Another important predecessor of learning and the creation of knowledge is *participative decision-making*. If organizations enable their employees to participate in the decision-making process then the employee will have a higher motivation to engage in learning activities. This participative decision-making also stimulates creative thinking which will lead to the development of new ideas which are very important for the innovation project team. What also is important is that active involvement in the decision-making process reduces the risk of employees being averse to change since the employees themselves will be the initiators of change (Blazevic & Lievens, 2004, p386).

With their model, Dimitriadis and Stevens (2005, p191) add to the above the fact that the external context is also important for learning. Here it appears to be a

source of innovation due to the potential threat of a change in the legal context. The increase of competition also poses a threat and therefore influences innovation. The interpretation of the environment might be more important than the external environment itself. The way an individual interprets the data and is able to generate knowledge from it is one of the most significant characteristics contributing to the competitiveness of an organization for that individual. In the service industry this competence should be embedded in the organization. For projects this implies that the project manager must gather, associate and integrate various competencies and skills. It is the task of project manager to ensure that each contributor learns from organization interactions and customer requirements. It is therefore also important that the new service development process and the projects executing it are supported by top management. It is their job to open the scope by using vision, vocabulary and vague concepts. This opens space for individual variance and through that the potential for innovation (Stevens & Dimitriadis, 2005, p193).

4.4 Project Management and Innovation

Bresnen et al (2003, p158) believe that project-based organizations or organizations that make much use of projects should benefit from the innovative nature of project tasks. As was explained in chapter two, projects usually involve the development of new products and services, which makes it an apparent opportunity for the creation of new ideas and for cross functional learning to take place. It is assumed that that will increase the innovative capacity of an organization. In practice it is true that projects are often used to implement change in conventionally ordered functional settings. As yet discussed in chapter two, the difficulty is in managing knowledge and organizational learning in a project environment.

The organizational context has proven to be relevant for innovation throughout the literature. This has put forward organizational models that support innovation efforts. Keegan and Turner (2002, p386) have created a table that draws a cross-section from these models (see table 1). The table summarizes some features that contribute to the innovative context.

-
- Sophisticated information processing and co-ordination mechanisms;
 - Extensive formal and informal communications;
 - Vagueness of organizational boundaries;
 - Combining personnel, boundary spanners and matrix structures;
 - Substantial pressure and uncertainty for managers and workers;
 - Bottom-up emergent strategies created by managers;
 - Bendable roles determined through contact between organization members;
 - Project managers facilitate projects rather than control projects;
 - Decentralization of authority and less focus of power;
 - Effectiveness emphasized instead of efficiency;
 - Multi-functional project teams consisting of members of different disciplines perform work.
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Table 1: Organizational characteristics that support innovation (Keegan & Turner, 2002, p386)

Theory has emphasized that being innovative is important. Innovation alone is not enough to compete in the hypercompetitive market though. Innovation thus needs to be paired with value in order to ensure that organizations are able to pursue sustained high growth and profits through innovation strategy. It is therefore argued that knowledge should not be seen as valuable in itself but it should be seen to add value to where it is created and applied for specific purposes (Swan & Scarbrough, 2001, p3).

Keegan and Turner (2002, p382) mention that innovation theory argues that the organic management of innovation projects requires loosening control, that redundancy and slack are important in the development of innovation. Organic management in this respect is an approach that is aimed at the creation of a favourable internal environment. Organizations using organic management usually influence the behaviour of employees by focusing on training and motivating and by providing them with a shared set of norms and values (Homburg & Fürst, 2005, p96). The reason behind having redundancy is to create space for the occurrence of innovation and development. Redundancy ensures more flexibility of systems. Many organizations are mechanistic in nature. An explanation may be the institutionalisation of project management knowledge. Contemporary definitions of project management

emphasize control of work to specific time, cost and quality constraints. Where innovation and projects meet, success is mostly defined by the correct project management instead of effective innovation management. When embarking on new, risk full and uncertain projects it is thus wise to do this in a more conventional way where the importance of uncertainty is disguised and project control and evaluation proceeds as though innovation can be exactly defined, planned and evaluated according to preset criteria. Evaluating projects according to preset criteria in the early stages of a project will lead to the elimination of projects that will not be able to produce benefits in the short and long run. The methods for evaluating projects with strict and preset criteria are becoming more widespread throughout business. In order to promote innovation it might be wiser to relax the rules for innovation projects though this is not gaining ground due to the fact that most organizations do not want to run the risk to lose money, time and perhaps reputation. Organizations do not have the time to watch and wait for results and to support this process with additional resources. Studies have found that project teams are sometimes able to get around the strict methodologies of evaluations and are 'creative' in their working, resource gaining and progress reporting in order to be innovative (Keegan & Turner, 2002, p384).

Slack can be defined as the number of resources in an organization above the required minimum that is necessary to produce the normal level of organizational output. Slack resource can include redundant employees, capacity that is unused at that time and other unnecessary capital expenditures. An organization can use slack resources in response to uneven performance or budget cuts. Slack resources can also be used to engage in experimentation. The positive relation between slack and innovation can be explained by two underlying mechanisms. First is the effect of slack on experimentation and the second is the effect slack has on the exercised over experiments (Nohria & Gulati, 1996, p1246). The positive effect of slack on innovation is also recognized by Blazevic & Lievens (2004, p385). Slack resources tend to be a common denominator for innovative organizations. There are two different views on the use of slack within organizations. The neo-classical approach to management control does not view slack as useful as it can be perceived as inefficient use of resources and the promotion of wastefulness. Whereas the modern innovation management school of thought do believe it useful because providing slack resources

for people makes much business sense and helps organizations retaining valuable employees.

Too much reliance on strict control of projects and evaluation methods thus seems to hinder innovation. An ambivalent or hostile attitude towards slack resources also hinders innovation. Innovation as a whole is often viewed as risky, expensive and possibly dangerous which is the reason that organizations do not adopt the academic theoretical views of loosening control and organic management.

Daskalakis (2005, pp22-24) does not mention slack and loosening control but argues that the success of innovation is dependent on the development of trust between people amidst the process of collective problem solving. This collective problem solving can ensure economies of scope and time saving with regard to generating new knowledge. Daskalakis also shows that in the context of collective problem solving, the emergence and the dynamics of trust are dependent on the interdependence between trust and the interaction process. Developing trust and generating new knowledge are two interdependent processes according to the findings of the author. The evidence found for interdependence includes the fact that declining knowledge exchange over time leads to a decrease in trust.

4.5 Conclusion

As this chapter has shown, for projects to be able to contribute to service innovation, knowledge is of major importance. Almost every article and author mentions the significance of knowledge and organizational learning as facilitators of innovation. An important theme that most authors touch upon when writing about innovation, projects and knowledge is the fact that cross-functional projects and communications are significant to the success of the project and of the organization as a whole. Concerning the management of innovation projects, literature has shown that to make best use of resources, the organization needs to create loose control of management and trust.

Chapter 5 The Effect of Knowledge Management in Projects on Innovation

5.1 Introduction

This final chapter will recapture the previous four chapters and aim to take these previous chapters one step further by concluding from them and expanding to the actual impact of products and services innovation on an organization's strategy. The chapter will begin with describing the impact of learning and knowledge on the performance on innovation. This will then be translated to the required knowledge management in and across projects. The final paragraphs will then continue with the manner in which management and the organization as a whole must act in order to make optimal use of knowledge in projects in order to be innovative in its services.

5.2 Knowledge and Innovation Management

Organizational learning is synonymous for developing a knowledge base. Knowledge can be described as the outcome of learning and organizational learning can be described as the process in which knowledge interactions are developed in a dynamic environment. Innovation in this respect can be considered as an organizational activity that is directed at the creation of a knowledge base (Blazevic & Lievens, 2004, p385). Brady & Davies (2004, p1605) describe the knowledge base as the tacit knowledge of an organization that is rooted in its routines and through that stored in its organizational memory. Formalized memories such as written documents and other types of explicit knowledge are important but are not sufficient to maintain the memory of the organization. In this respect, innovation of products and services can be achieved by a the change in the routine.

In an environment that is stable and where established routines and behavioural patterns do not usually go out of date, there will be little interest in learning. In this type of environment it may even be that the learning that does occur can ignite routines to resist change. Brady and Davies (2004, p1607) suggest that when actions improve performance, most organizations usually repeat them until they

become standardized or routine procedures. Organizations should however be careful not to behave too automatically and unreflectively due to these standard procedures as this prevents them from being innovative. When the environment is changing rapidly, organizations need to face the challenge of exploring new alternatives, re-use their current resources and develop new capabilities and routines. The survival and competitiveness of an organization is thus dependent on its ability to select successful routines and practices, and also to create new routines and practices. It is also important that time is taken to reflect on the lessons learned since this is essential for the knowledge conversion from tacit to explicit knowledge. The tacit-explicit dimension is established throughout literature as is discussed in chapter one of this thesis.

Innovation management deals primarily with issues relating to the effective management of the innovation process. One of the main difficulties for organizations involved in various knowledge management activities is the fact that the innovation strategy needs to be improved constantly. It is vital to make the most efficient use of knowledge to create, better, faster and more cost-efficient innovations in order to remain competitive. This process is more than identifying and resolving issues on knowledge management and innovation management alone according to Goh (2005, p6). It involves getting the capability to employ knowledge management practices for executing innovation management processes as a set business strategy that will help increase the innovation performance level. Knowledge innovation can be defined as the creation, evolution, exchange and application of new ideas into products and services that will lead to a higher success of the organization. This definition recognizes the significance of knowledge in the innovation process. The management of the flow and use of knowledge is also important here. Goh (2005, p7) proposes the integration of knowledge management and innovation management (figure 6).

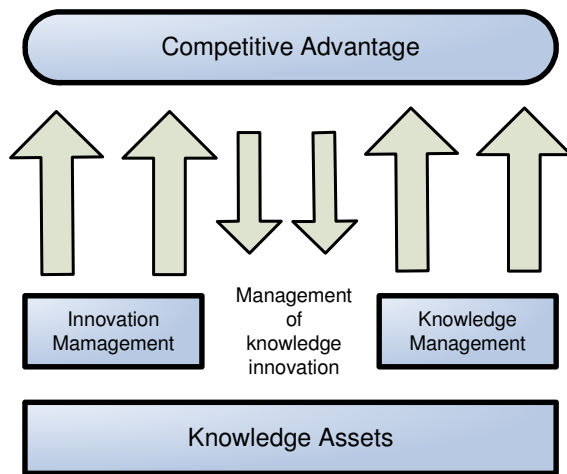


Figure 6: knowledge innovation as a competitive tool (Goh, 2005, p7)

5.3 Knowledge and Project Innovation

As described in chapter two, projects are agile organizational forms and can be significant carriers for organizational learning and the creation of knowledge. The nature of projects should lend itself to greater organizational flexibility and innovativeness. The experience that is gathered in one project should be transferred to following projects. If this does not happen, knowledge might be lost and the same mistakes will be repeated. This has also been discussed in chapter two. The chapter has shown that project teams often miss the time or motivation to document their experiences and recycle them for future projects. This is also acknowledged by Brady and Davies (2004, p1605). It can be argued that many projects, though unique in nature have many recurring activities that can provide room for routinized learning or systematic repetition. An organization can exploit learning and increase performance when it will optimize the similar and predictable categories projects have. Knowledge creation and learning can occur at various levels such as individual, project or organization. It is often an unintended side-effect of the project process but should be focused on by organizations. When this knowledge is captured properly, the organization will be able to speed up its project life cycles and benefit from first mover advantages. The organization will be able to move more quickly down the learning curve for each of the project capability requirements than its competitors (Brady & Davies, 2004, p1608).

Projects are often used by organizations to achieve strategic and operational goals and to adapt to a rapidly changing environment by creating innovative new products and services. Learning is therefore vital for the competitiveness of these organizations in the market. As already discussed in chapter three, there is much risk of losing the learned knowledge and experience when the project finishes and the members have moved on to other projects or to their own jobs. This leads to a repetition of mistakes when the lessons learned are not communicated to following projects. On the other hand, in order to respond innovatively to the environment it must explore unknown alternatives and develop new capabilities (Brady & Davies, 2004, p1607).

Brady and Davies (2004, p1607) propose a model that will ensure that the learning's from projects can be captured and is spread throughout the organization. The model begins with capturing knowledge within each project. This is important because when there is a difference between the knowledge requirements and the existing knowledge there is a knowledge gap. This usually occurs, or is noticed, when an organization aims to introduce a new product (Hall & Adriani, 2002, p29). The second step is to ensure project to project learning. Here, attempts are made to capture the experience and insights of participants in a previous project and transfer them to subsequent project that can benefit from this knowledge. Members from the first initial project may be reassembled to join the subsequent work, creating the opportunity for social interaction and the sharing of experiences on a face to face level. Apart from this personal transfer of knowledge, it is also important that formal learning mechanisms such as project reviews, intranets and databases are developed. These will be able to capture the learning that was gained on the projects, codify it and ensure availability to other project teams. When this new type of project has been undertaken a sufficient number of times, there is the opportunity to transfer project learning to organization learning. An organization should now attempt to consolidate the initial learning's and to systematically distribute this knowledge throughout the business unit that is responsible for delivering projects. This unit should then adapt to this or create new specialized units that can support the projects. Here it is important that the cumulative learning from projects is captured and that new routines, information and processes are institutionalized. New standardized processes and IT

systems should further ensure embeddedness of the new knowledge in the organization (Brady & Davies, 2004, p1607).

Apart from how it should be managed practically it is also important that project managers create an organizational setting for team members that will encourage and facilitate learning behaviour. It is therefore essential that this environment is made possible by top management commitment. The organizational environment should stimulate the exchange of ideas and allow for mistakes. The organization should provide for opportunities for training, give support and encouragement and reward efforts. Not only will this benefit the employee's job satisfaction but also create a sustainable and non-imitable competitive advantage. The organization should also encourage cross-functional knowledge sharing since this will give employees better insight in the organization as a whole and facilitate more creative and boundary crossing problem-solving. Developing a social community and ensure participative decision-making will therefore stimulate learning due to the formation of an organizational identity through shared values and meanings. This is also recognized by Loch and Morris (2003, p6). Lindkvist (2005, p1189) defines communities of practice as tight groups of people that have worked together long enough to develop into an interconnected community of mutually and shared understandings. Within the communities of practice, less experienced members can learn from experienced members through social interaction. The most recognized benefit of communities of practice is their ability to provide a novel view to traditional knowledge management and allow for the generation of tacit knowledge and the distribution of it. Since tacit knowledge is difficult to imitate, it is agreed throughout the literature that this type of knowledge is key in sustaining organization competitiveness (Ardichvilli et al, 2006, p95). This was also concluded in chapter one. The notion of communities of practice does however not entirely fit with the way how many organizations making much use of projects operate. These will normally consist of people from throughout the organization that have usually have not met before. As they usually are individuals specialized in different competences, developing a shared understanding or a common knowledge is difficult (Lindkvist, 2005, p1190).

5.4 Management of Knowledge in Project Innovation

As mentioned by Blindenbach-Driessen and van den Ende (2006, p547) in chapter four and in the previous paragraph, management support has much influence on the effectiveness of learning during the new service development process. Top management needs to create the platform for knowledge diffusion and should stimulate organizational learning within and across all departments. The support of management hereby shows the importance of the exchange of knowledge within an innovation project. Employees will be more willing to share knowledge when top management has communicated the importance of a certain project. Oke (2003, p32) adds that it is essential that management develops a strategy and communication concerning the role of innovation within the organization. They claim however that it is not sufficient to just state the strategy. The organization needs to clarify the definition of the innovation first.

Organizational learning is dependent on the contributions of individuals. Blazevic and Lievens (2004, p375) view innovation as an organizational activity which is directed at organizational effectiveness. They mention that individuals and groups thus act as resources that need to be managed to achieve organizational effectiveness. In this way, the performance of the individual will contribute to the performance of the group which will then enhance organizational performance by being extra competitive in the market due to innovative products. It is therefore essential that organizations understand both individual and group behaviour for effective innovation management. Projects do pose several challenges in organizational learning. The life cycles of projects are usually developmental, non-repetitive and usually organized around teams that are put together for that project. These teams are often rapidly dispersed after the ending of the project. It is therefore often a challenge to create the right knowledge management. Loch and Morris (2003, p3) propose several best practices that are listed in table 2.

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- Systematic collection of project learning;
 - Transparency of the project development process;
 - Regular project review points:
 - Post-project evaluation;
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- Distinguish between tacit and explicit knowledge;
 - Identify key persons to be ‘owners’ of specific knowledge areas;
 - Make use of Information Management tools that will help to capture, store, process, archive, retrieve and present explicit knowledge;
 - Ensure project routines designed to access knowledge by the project team;
 - Establish an integrated knowledge management program throughout the organization:
 - Include formal management for the program;
 - Install a knowledge management manager;
 - Make a distinction between individual-, team- and organizational learning;
 - Set up a mechanism for updating knowledge;
 - Create a competency development program that is related to organizational learning on the individual and organizational level;
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Table 2: Learning in projects (Loch & Morris, 2003, p3)

Organizations that are capable of capitalizing on the opportunities that arise from knowledge-based assets and are able to derive the most value from them will be the most competitive in the market. To make the most value of these assets, organizations must identify the various types of knowledge-based assets that benefit businesses and understand how knowledge management practices can be effectively implemented. Knowledge will add value by its contribution to products, processes and people. Knowledge management will transform knowledge-based assets that are associated with products, processes and people into knowledge capital (Goh, 2005, p9). However, where innovation and projects come together the space is still dominated by how projects are managed rather than how innovation is managed. Management of projects is often more rigid and mechanistic than organic. It can be argued that this type of management should be innovated in itself (Keegan & Turner, 2002, p384).

5.5 Knowledge, Learning and Organizational Strategy

An organization that is capable of reacting to changes in the environment and is able to learn in that process will be likely to do better than its competitors. An organization that is continuously learning will most likely improve future organization performance. There are several performance measures in order to determine the impact of learning. These measures include corporate reputation, competitive position, efficiency in the use of resources, cross-selling and service delivery capacity. In the hypercompetitive service market it is very important to have a good corporate reputation since the service itself is usually difficult to differentiate and imitate. Promoting its competitiveness can also be beneficial for the reputation of an organization (Blazevic & Lievens, 2004, p386). With respect to an organizations competitive position, learning is also essential. An organization must be able to learn equally as fast as or faster than it's competitive if it wants to maintain its competitive advantage. The organization will be able to differentiate itself from its competitors through the introduction of a new service. The created competitive advantage will be difficult to imitate. An active learning strategy demonstrates that an organization is likely to reveal dynamic product and service development and a good customer orientation. The efficiency in the use of resources of an organization can also be enhanced by learning. An organization's memory will enhance the speed of innovation projects and will ensure that an organization's members know where to find necessary information. Effective learning therefore reduces the information overload of employees and through that, ensures consistency and effectiveness of knowledge use. This will in turn have a leveraging effect on future innovation projects because of increased organizational capacity and idea distribution. Cross-selling is encouraged by learning through the development of new services which may attract new customers. These customers might also buy other products form the organization, which is. This is also a performance measure that determines the impact of learning. Throughout the project, the team is involved in information processing activities. This helps in learning more about the organization's customers and competitors. These insights can be exploited and put to use in new products and services. Learning also has a positive impact on service delivery capacity. For example infrastructure that has been developed for certain projects can provide a platform for future service developments (Blazevic & Lievens, 2004, p380).

Organization must rethink their role if they were to incorporate knowledge management practices into innovation management thinking as a competitive tool. Goh (2005, p11) has defined six knowledge-centred principles that separate knowledge innovation from other management approaches. Knowledge innovation is in this respect different than product or service innovation as is the subject of this thesis. However, as literature has revealed, it is vital that an organization has a well-defined knowledge strategy, one which can be attained when applying the following principles:

1. Understanding the innovation value system instead of the value chain. The innovation value system consists of dynamic knowledge processes and stands for relationships that are interdependent and that need to be understood, well thought-out and developed in order for knowledge innovation to do well. This opposes value chain thinking which is linear and static.
2. To formulate a collaborative knowledge strategy instead of a competitive information strategy. The collaborative knowledge strategy encourages win-win situations by setting up symbiotic relationships through sharing knowledge-based assets. Competitive information strategies usually create win-lose situations because of the competition that are after the same piece of information.
3. To manage knowledge networks and not business units. The management of business units often results to isolated units of information assets. Creating a strategic knowledge network might foster the flow of knowledge-based assets between members of the innovation process.
4. Use human knowledge management solutions instead of machine-based knowledge solutions. As is discussed before information technology solutions are usually better at collecting information and categorising it, but for the interpretation of the information and providing it with a context, human skills are preferable. Johanessen et al (1999, pp125-128) claim that the value added for the customer comes from the communication among the members of an organization. To have this, and organization needs creativity, vision, knowledge creation and organizational learning.
5. Engage in bottom-up process improvements instead of top-down. The bottom-up approach enables more room for spontaneity whereas top-down attempt are often hindered by politics and rigidity. It is important though that top management

intervenes in order to avoid reluctance to engage in innovation (Keegan & Turner, 2002, p384).

6. Ensure that focus is on customer success and not on customer satisfaction. It can be argued that a focus on customer satisfaction is to focus solely on the short term. A focus on customer success will help identify future requirements and needs which are essential for organizational growth.

5.6 Conclusion

This chapter shows that successfully developing new services is a consequence of well coordinated organizational activities. Learning must be stimulated in such a way that it not only facilitates learning and thereby the creation of knowledge but it should also encourage active learning behaviour. To build a knowledge base through project learning, an organization needs to pay extra attention to internal communication and the organizational design setting. It is important that an organization draws upon the knowledge and experience of people working together in that organization to influence the pool of resources and perform activities that create competitive advantage. In order to have the creation of knowledge contribute to the success of an organization by attributing to its innovativeness in the market, it is required that organizations create a fast, responsive and boundary less setting.

Conclusion

Organizations today are increasingly organized around knowledge integration, people integration, processes, quality and service. These features make the traditional methods of organizing and managing more and more ineffective. The traditional manner of competing in the market is no longer the means of distinguishing on the basis of product, service or price. If an organization is able to conceptualize and manage change and is able to compete from the inside out through an increase of the learning capacity of its knowledge employees, it will be able to create a competitive advantage. To come to this point, the organizations must face several challenges, especially in the management of the employees. As discussed, most of the knowledge required for the creation of new products and services that will add value and will potentially increase an organization's competitiveness is tacit knowledge which resides in the minds of the individual employees. Traditionally much literature has focused on explicit knowledge. However, chapter one has shown that tacit knowledge might be more significant though in practice both explicit and tacit knowledge should complement each other in the creation of knowledge within an organization.

Organizations can fall in many pitfalls when not effectively managing their knowledge base. Losing knowledge at the ending of a project is a major hazard for organizations. Organizations have the opportunity to save costs and create sustainable competitive advantages if they are able to learn from the resolving of issues in previous projects. Organizations also have the opportunity to avoid repetition of mistakes and re-inventing the wheel in every project. The thesis has shown that literature proposes several solutions to the knowledge problem but that none of these solutions solve the knowledge transfer problem.

An organization will be able to achieve strategic competitive advantage, if it is able to create and communicate knowledge effectively within each project and throughout the company. Knowledge and innovation can be seen as the competitive strength needed for organizational success. Organizations that will perform well are the ones that are able to recognize and utilize the knowledge within the company effectively and put this to good use to create innovative products or processes. Organizations that are able to press forward their own businesses and leverage their

internal knowledge at the same time outside their current procedures are likely to do well in the innovative market. It is not so much an organization's size or position or its depth of knowledge that determines an organizations advantage but rather its skills to react and lead in a changing environment. Learning from the experience of innovation team members and using the tools and methods that this team has been using will improve the quality and speed of problem solving. The mobility of information and knowledge will increase with communication networks and organizational memories. The stored explicit knowledge can then be retrieved easily throughout the whole organization without time delays due to 'reinventing the wheel'. To be able to retrieve and use tacit knowledge it is important that organizations ensure cross-functional teams and will encourage knowledge sharing by creating communities of practice amongst the team members and perhaps throughout the organization.

Concerning innovation, projects and knowledge, cross-functional projects and communications are significant to the success of the project and of the organization as a whole. Concerning the management of innovation projects, literature has shown that to make best use of resources, the organization needs to create loose control of management and trust. The knowledge base of the innovation project team comes from the information processing activities during the innovation process. Innovation team members can be seen as bodies of knowledge. Information exchange within such a team will then help team members to use these bodies of knowledge. Innovation performance is not only dependent on the sharing of information within a project though it is also dependent on information coming from the rest of the organization. Project learning is therefore dependent of the type of communication flows. This guidance can be of one person in the smaller organization or a knowledge department within the corporate organization. This person or department will then ensure sufficient communication throughout a project and across projects. When making use of dynamic knowledge documents, the organization can build a substantial knowledge base that can than be transferred from one project to the next. It is vital though that company culture supports knowledge sharing. They can do this by establishing such a knowledge department but also by creating a culture that will stimulate the sharing of knowledge. This extensive knowledge sharing must ultimately lead to the ability of an organization to select successful routines and practices, and also to create new

routines and practices. It is also important that time is taken to reflect on the lessons learned since this is essential for the knowledge conversion from tacit to explicit knowledge.

Organizations that are capable of capitalizing on the opportunities that arise from knowledge-based assets and are able to derive the most value from them will be the most competitive in the market. Knowledge will add value by its contribution to products, processes and people. Knowledge management will transform knowledge-based assets that are associated with products, processes and people into knowledge capital. If an organization is able to make the best use of this knowledge and is able to manage this across its projects it will be able to be more innovative than its competitors.

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