An Exploratory study of Interproject learning mechanisms and Project competencies of Consultancy firms in Sweden; perceptions of project management practitioners
Dedication

“We would like to begin with a confession: We do not believe in a “best” choice of theory, but regard theoretical perspectives as interpretive “tools” or sensemaking devices in relation to organizational processes. What we select as sensemaking devices can hardly be explained as rational choices. Our choice of theory is an idiosyncratic selection (but hopefully an informed one) based on affinity, past experiences, and curiosity. Our retention or discarding of theory is not the result of orderly learning processes but is heavily influences by what the local scientific communities we have the luck to belong to deem appropriate and performative”

(Borum & Christiansen, 2006)

To my parents in China - Guoming Yan and Liangjun Yi!
I miss you so much for being away for 16 month and wish you healthy forever!

Lina Yan

To my two younger nephews – Muna & Mainga!
[The two sons of my late younger brother – Best Mainga]

Thanks so much for enduring the ‘abandonment’ during the last 16 months. Wishing you both, the very best that God can give!

Wise Mainga
Abstract

Increased globalization has come with it increased competition, multitude of international competitors, dramatic and frequent changes in customer tastes, shorter product life cycles, and frequent and rapid technological/product upgrading. Resultant competitive pressures have led to the emergence of two trends among some firms and industries. Firstly, there is an increased premium placed on the role of continuous learning and knowledge accumulation as the most dependable base for sustainable competitive advantage in today’s dynamic global markets. Secondly, there is increased trend towards organizing more economic activities as distinct projects. The above two trends provides both opportunities and challenges for any firms, especially project-based firms (PBFs). A number of past researches have emphasized the importance of investment in interproject learning as a means to foster continuous upgrading of project competencies. This is equally applicable to more knowledge intensive project-based firms in the Consultancy services sector. However, no study had been done in Sweden on Consultancy firms, from the perspective that they are project-based firms.

This study explores, describes and analyzes the various characteristics of interproject learning mechanisms and project competencies found in a sample of consulting firms in Sweden. The study focuses on the perceived importance of different interproject learning mechanisms and their perceived impact in developing project competencies in consulting firms. The study interrogates the ‘perceptions’ of ‘key’ informed project management practitioners, who have experience of managing consulting projects. Their perceptions about project activities in their respective firms helped capture a ‘managerial’ view, as well as, provide ‘expert’ opinion.

The study find that the most highly ranked and valued interproject learning mechanisms involved some degree of face-to-face interactions. Learning mechanisms that enable the capture, storage and transfer of explicit knowledge, though important, were not ranked highly in importance as person-to-person communication. The difference might be due to the efficient way the latter mechanisms have in transferring socially embedded and context-dependant tacit knowledge, which comprise a large part of knowledge applied in projects. Most of the respondents seem to indicate that their respective firms emphasized development of project competencies that were underpinned by ‘product knowledge’, which emphasize capabilities to deliver short-term project goals (i.e., delivering a particular service/product on a certain date). Respective firms didn’t seem to invest more in project competencies that are underpinned by ‘process knowledge’. The latter is aimed at long-term continuous improvement of project processes, which in turn has impact on developing dynamic competitive advantage. With regard to organizational learning infrastructure needed to support interproject learning and the development of project competencies, the results from the survey provides a mixed picture. While some firms had put in place a series of well implemented organizational structures, procedures, processes and routines to support interproject learning, some other learning supporting infrastructure were not that well implemented (i.e., explicit scheduling of time to do ‘reflections’ during project execution, emerging of a ‘no blame’ culture, instilling a culture of experimentations). Based on our research findings, a number of recommendations are outlined.

**Key words:** Interproject learning mechanisms, project competencies, project-based firms, Knowledge transfer, Consultancy sector
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Chapter 1: GENERAL INTRODUCTION

1.1. Background Introduction

Past researches has identified project-learning as crucial to the long term market success of project-based firms (i.e., Anbari et al. 2008; Ayas, 1997; Prencipe and Tell, 2001; Williams, 2003; Zedtwitz, 2002). Project success is partly dependant on the ability of project teams to be able to extract as much knowledge from the many projects undertaken in the firm and transferring the knowledge gained to other projects (Prencipe and Tell, 2001; Sense and Antoni, 2003). Brady and Davies (2004: 1601) observes that “learning through and from projects is increasingly important for competitive success”. Despite the growing awareness of the importance of project learning to firm-level competitiveness, relatively fewer firms have institutionalized mechanisms to systematically capture new project-knowledge and re-use it to improve the execution of subsequent projects (Korners and Goffin, 2007; Schindler and Eppler, 2003; Sense, 2007). For example, conducting systematic post-project reviews (PPRs) is one of the main means of transferring new knowledge accumulated during the execution of one project to other projects (Kasi et al., 2008). Yet several studies find that fewer firms actually do post-project reviews (i.e., Gwillim et al., 2005; Kotnour and Vergopia, 2005; Kumar, 1990). Zedtwitz (2002) gives the results of a survey which shows that around 80% of R&D projects are never subjected to detailed post-project reviews after the completion of the project. Even for most of the remaining 20% of R&D projects that were reviewed, formal post-project reviews were sometimes done without proper review guidelines (ibid). A study focusing on microelectronic manufactures found that only two (2) out of thirty-three (33) firms used formal post-project reviews (PPR) to foster interproject learning (Boag and Rinholm, 1989). Cooper et al. (2002: 213) observes that “We have yet to discern how to systematically extract and disseminate management lessons as we move from project to project …”. Great opportunities to enhance future project performance are, therefore, missed when systematic project reviews are overlooked (ibid). Consequently, mistakes made by project teams during project execution are often repeated in subsequent projects. And the tendency to ‘re-invent the wheel’ still plague most projects, as solutions to project problems encountered in the past are recreated to overcome current project challenges.

Project-based firms (PBFs) face several challenges in transferring learning and knowledge accumulated during the execution of one project to another (often) very different project(s) or the parent organization (Boh, 2007; Prencipe and Tell, 2001). Transferring of lessons learned across current and future projects is seen to be key in developing dynamic competitive capabilities, which are needed to survive in today’s globally competitive market place (Newell and Edelman, 2008). A growing number of researchers are now emphasizing the critical importance of learning and knowledge accumulation in building-up project competencies (i.e., Anbari et al. 2008; Kotnour and Vergopia, 2005; Soderlund, 2005). These researchers point to the crucial role ‘project knowledge’ accumulated across a consecutive series of projects can play in enhancing the market performance of firms. They place continuous learning and knowledge accumulation at the very center of firm-level competitiveness. Project-based firms (PBFs) may well be advised to develop various learning mechanisms that can enhance the accumulation of relevant project knowledge (Brady and Davies, 2004; Soderlund et al., 2008; Williams, 2003).
Despite growing emphasis on the need for continuous learning and knowledge accumulation, very few studies have examined the relative effectiveness of various learning mechanisms in strengthening different types of project competencies, across different firm-types and subsectors (Kotnour and Vergopia, 2005). It might well be that different learning mechanisms (or their combinations) are good at collecting different types of knowledge needed to develop different types of project competencies. This raises the possibility that certain learning mechanisms might not be appropriate channels to use in developing some types of project competencies in particular sectoral contexts. For example, Kasi et al., (2008) has observed that adopting post-project audits in certain cases might reinforce organizational learning dysfunctions rather than improve current practices. It is, therefore, not clear whether different types of project-learning mechanisms are effective in developing various types of project competencies in different sectors. Focusing on individual economic sectors might help clarify certain sector-specific issues associated with developing project competencies in project-based firms. To fill this gap, this research study aim to explore and examine interproject learning mechanisms and project competencies in the consultancy sector in Sweden.

To set the context of the study, the Research Objectives are given in the next section, followed by the corresponding research questions. Thereafter, definitions of the main concepts/terminologies used in the study are given. This is followed by sections describing the significance and delimitations of the study. Finally, the chapter ends with the organization of the whole research study or thesis.

1.2. Research Objectives

The prime research objective is to explore, describe and analyze the perceived nature of interproject learning mechanisms and project competencies of project-based firms (consultancy firms) in Sweden.

The prime research objective has been broken down into three minor objectives. The three research sub-objectives are:

(i) To identify the different types of interproject learning mechanisms used by project-based firms to transfer lessons learned on one project to another project(s) or parent organization. This objective will be achieved through detailed literature review.

(ii) To determine – from project management practitioners’ perceptions – the types of project competencies that are well developed as a result of investment in interproject learning in consultancy firms. This objective will be achieved through survey questionnaires (and interviews).

(iii) To examine the nature and extent to which different components of ‘organizational learning infrastructure’ have been developed by consultancy firms, to support and enhance interproject leaning. This objective will also be achieved through mailed survey questionnaires (and interviews).

The proposed study will focus on project-based firms operating in the consultancy service sector (i.e., Deloitte, PA Consulting, KPMG, etc). A couple of previous studies have been done on consultancy firms. When organizational knowledge is studied in consultancy firms, it is mainly covered from the ‘Knowledge Management’ or organizational learning perspective. However, most consultancy firms can also be seen as project-based firms. They render unique customized
services to different customers. Most of their services are provided within a particular time frame. Equally important, they are considered to be archetype of ‘knowledge-intensive’ firms (Donnelly, 2008; Werr and Stjernberg, 2003). Most studies done on project-based firms have been done in engineering, technology, constructions and R&D sectors. Most consultancy firms are a unique type of project-based firms, in that their main output is not normally a product but a service. Consultancy firms are also very involved in knowledge production. It is, therefore, fruitful to focus our study on the consultancy sector. As recommended by Prencipe and Tell (2001), further research is required to examine the effectiveness of different interproject learning mechanisms in different contextual environments.

1.3. Research Questions

To achieve the above research objectives, one main research question was developed. The main research question is:

*What is the perceived nature of interproject learning mechanisms and their impact on strengthening different types of project competencies in consulting firms in Sweden?*

The main research question is further decomposed into three specific research questions. The three sub-questions are:

(i) What are the different types of interproject learning mechanisms used by consultancy firms to transfer lessons learned on one project to other project(s) or the parent organization? And what are their perceived ranking in importance?

(ii) Which types of project competencies are perceived – by project management practitioners - as well developed due to investment in interproject learning in consultancy firms?

(iii) Which learning infrastructure, systems, procedures, and routines have been built-up to support and promote organizational-wide interproject learning? To what extent are different components of learning-supporting infrastructure perceived to be very developed?

1.4. Definitions of main Concepts

Before discussing the main theoretical framework that will guide the study, we need to give the definitions of the main concepts that are used in the study. In most literature, a couple of definitions have been given to each of the various concepts used in this study. It is, therefore, important to delineate how the concepts are used and defined in this study. Some definitions given here are tentative, however, as more discussion on the concepts is given later.

1.4.1. Project

The Project Management Institute defines a project as "a temporary endeavor undertaken to create a unique product or service" (PMI, 1996: 167). Projects are constituted to deliver a customized output within a limited specified time frame. A multi-disciplinary project team is often put together to produce a particular deliverable. The multi-disciplinary interactions within the project team provide an opportunity to mobilize and integrate various knowledge streams. This provides the perfect environment to generate new insights and knowledge. In addition, projects provide the opportunity to focus efforts, enhance flexibility and speed to change in new directions if need arises (Boh, 2007; Lampel et al., 2008; Whitley, 2006). In spite of the positive
aspects associated with project organizing, projects have their own drawbacks. They often perform poorly in transferring new insights and knowledge generated within the project team to other projects and the parent the organization (Hobday, 2000). The short-term nature of most projects and project teams often leads to an over-emphasis on short-term objectives (i.e., focus on meeting immediate milestone or deliverable), as opposed to focusing on long-term objectives, i.e., emphasis on enhance long term competitiveness through investment in learning efforts (Boh, 2007). It is investment in learning efforts that builds-up long term project competencies, which in turn, determine long term competitiveness (Anbari et al., 2008; Newell and Edelman, 2008).

1.4.2. Project learning

Project learning is defined as new knowledge and experience that is generated and acquired during the execution of projects (Ayas & Zeniuk, 2001). During the execution of any project, new knowledge is accumulated as project teams encounter (unfamiliar) difficulties and devise solutions to overcome such hurdles (Soderlund et al., 2008). As will be discussed later, project-learning involves much more than ad hoc problem solving or learning-by-doing. It incorporates deliberate and systematic reflections on project experience (Ayas and Zeniuk, 2001). The new knowledge, if captured and stored adds to the organization’s memory/knowledge-base, and to its project competencies. Project-learning takes place at different levels and has many dimensions. At the project level, project learning might be broken down into two related parts; intra-project learning and interproject learning (Kotnour, 1999).

1.4.3. Intraproject learning

Intraproject learning takes place within the project team working on a particular project, while interproject learning takes place across projects. As put forth by Koch (2004), the former is associated with knowledge production within a project, as opposed to the latter, which emphasizes enhancing organizational knowledge. Intraproject learning focuses on the successful delivery of a single project, while interproject learning focuses on developing capacity to deliver a series of successful projects. Interproject learning, however, can not take place without intraproject learning.

1.4.4. Interproject learning

Interproject learning is the capturing of new knowledge created and accumulated during the execution of a project, and transferring that knowledge to improve the execution of other current and future projects (Newell and Edelman, 2008; Schindler and Eppler, 2003; Prencipe and Tell, 2001). Other authors use different terms to refer to the same phenomenon. DeFillippi and Arthur (1998) use the term ‘cross-project learning’, while Brady and Davies (2004) uses the term ‘project-to-project learning’. Interproject learning aims at transferring project knowledge that ensures the successful delivery of a series of projects (Kotnour, 1999). An indepth discussion of the various dimensions of interproject learning is given later.

1.4.5. Interproject learning mechanisms

Interproject learning mechanisms are defined as ‘empirical instances’ (i.e., informal encounters, databases searches, ‘lessons learnt’ meetings, etc.) which involve the production, collection, storage, access, dissemination, and reuse of new project knowledge (Prencipe and Tell, 2001).
1.4.6. Project-based firms (PBFs)

Project-based firms (PBFs) are those companies which organize all or a large portion of their operations or work as projects (Lindkvist, 2004). It is possible that larger firms may run a small section of their business activities as project, but not necessarily qualify to be referred to as project-based. The difference is that PBFs emphasize “project dimensions rather than the functional dimensions of organizational structure and processes” (Sydow et al., 2004: 1476). PBFs often produce or provide ‘one-off’ tailored products and services to specific customers. Increasingly, project based firms are being formed in a number of industries, including infrastructure, software, film making, management consulting, construction, advertising, telecommunication, etc.

1.4.7. Project Competencies

Project competencies have been defined as the underlying “knowledge, experience and skills necessary to perform pre-bid, bid, project and post-project activities” (Davies and Hobday, 2005: 62). Project competencies and capabilities are the outcome of a cumulative process of expanding the knowledge/capacity to generate and execute projects to the satisfaction of the unique customer (Soderlund et al., 2008). The development of project competencies are underpinned and supported by various learning mechanisms (Brady and Davies, 2004).

1.4.8. Dynamic Competitiveness

Several researchers have recently attempted to extend the ‘resource-based view’ of the firm, as they try to explain how organizations can sustain competitive advantages in today’s rapidly changing and unpredictable market contexts. Such efforts have led to the concept of ‘dynamic competitiveness’ (Eisenhardt and Martin, 2000). Johnson et al. (2008: 107) defines firm-level dynamic competitiveness as “abilities to recreate or regenerate its strategic capabilities to meet the needs of a changing environment”. Closely associated with dynamic competitiveness has been coined the concept of ‘dynamic capabilities’. Bueno et al., (2008: 156) defines dynamic capabilities as “the firm processes that uses resources to match and even create market changes, which are both strategic and organizational routines enabling firms to obtain new resource configurations as markets emerge, collide, split, co-evolve and die”. Zollo and Winter (2002: 340) defines dynamic capability as a “learned and stable pattern of collective activity through which the organization systematically generates and modifies its operating routines in pursuit of improved effectiveness”. Similarly, Teece et al., (1997: 516) defines the concept of dynamic capabilities as “the firm’s ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environment”. Dynamic capabilities are, therefore, associated with the possession of competencies to systematically transform a firm’s combination of resources into new sources of competitive advantage, in light of changing market dynamics. In this sense, dynamic capabilities underpin the continuous evolution of dynamic competitiveness in a fast changing environment.

In the context of project environment, the central role played by projects in the creation of new knowledge can be seen as a critical dynamic capability (Eisenhardt and Matin, 2000). Equally critical is the ability to systematically transfer such new knowledge and apply it to modify
operating routines, in the pursuit of enhanced project effectiveness (Newell and Edelman, 2008). Zollo and Winter (2002) supports this view, by arguing that (formal and deliberate) knowledge articulation and codification efforts are more effective mechanisms in developing dynamic capabilities, than reliance only on knowledge accumulated through project experience (i.e., learning-by-doing). The emphasis here is on systematic, structured, and persistent adaptive capacities. Even when successful, undertaking a series of ad hoc reactive problem-solving and adaptations does not necessarily constitute dynamic capabilities. Developing dynamic capabilities within project-work environments require institutionalization of relevant learning mechanisms, and continual strengthening of learning capabilities over time (Ayas and Zeniuk, 2001). Interproject learning capabilities contributes to long-term dynamic competitiveness when it allows PBFs to systematically accumulate new knowledge from various projects, which is then used to enhance the efficient and effective execution of other projects (Anbari et al., 2008; Newell and Edelman, 2008).

1.5. **Significance of the study**

This study is significant for several reasons, and only a few can be outlined here: (i) there is a growing need to understand the complex dynamics involved in managing the various interproject learning processes and how such processes impact on firm-level project competencies; (ii) such understanding is important as efficient development of competitive Consulting firms is crucial to knowledge-based economic growth (i.e., through the generation of new knowledge) and sustained job-creation within the EU; (iii) growing need to justify the opportunity costs associated with resource investment in interproject learning, and (iv) to the best of our knowledge, no study has examined interproject learning mechanisms in the consultancy sector in Sweden (i.e., from the perspective that consultancy firms are project-based firms).

1.6. **Delimitation of the study**

This research explores and analyzes interproject learning mechanisms and project competencies in a few Swedish consulting firms. It does not cover consulting firms located outside Sweden or non-consulting firms located inside Sweden. It is also a cross-sectional study, rather than longitudinal study. The study analyzes data based on ‘perceptions’ of project management practitioners, rather than what can be referred as ‘hard’ data on interproject learning. The data analysis is based on returned questionnaires only. Despite much effort, it was not possible to get access to any consulting firm where we could have done face-to-face interviews.

1.7. **Organization of the study**

After this chapter, the thesis covers Chapter 2 which focuses on the philosophical and methodological considerations that guided the study. Chapter 3 explores the relevant literature review, with some focus on knowledge, knowledge accumulation or learning, interproject learning mechanisms, and project competencies. The chapter ends with the development of a Research Model for this study. Chapter 4 outlines the Research design for the study. Chapter 5 covers the data analysis. Chapter 6 discusses the results in light of existing literature. Chapter 7 gives the conclusion of the study, and recommendations. The chapter ends by identifying limitations of the study, possible direction for future research, and validity and reliability of research findings.
Chapter 2: RESEARCH METHODOLOGY

2.1. Introduction

This chapter discusses some of the philosophical and methodological considerations that are related to this thesis. Specifically, research philosophy, research strategy, and research types are considered below. At the end of the chapter, we locate our study within the different research approaches.

2.2. Research philosophy

The research philosophical tradition provides the guidelines for knowledge development in a research project. Saunders et al. (1997) identifies two different philosophical research tradition, which are ‘positivism’ and ‘phenomenology’. Positivism is the philosophical approach that starts with existing theory, develops a testable hypothesis, which then is tested empirically, ending up with the conclusion whether to confirm or modify the theory in the light of empirical findings (Cooper and Schindler, 2003; Saunders et al., 1997). It is ‘deductive’, normally uses quantitative data, and is a greatly structured methodology so as to facilitate future replication of the study (Saunders et al., 1997: 71). Deduction is “the process by which we arrive at a reasoned conclusion by logical generalization of a known fact” (Sekaran, 2003: 27). On the other hand, phenomenology approach examines the way people “experience social phenomena in the world in which they live” (Saunders et al., 1997: 71), and tries to understand what and why things are happening from the respondents’/subjects’ point of view. It is more ‘inductive’, which means that the researchers first observes a certain social phenomena, collects data, analyses the data, and develops a theory on the basis of such analysis (Saunders et al., 1997; Sekaran, 2003). Cooper and Schindler (2003: 37) defines induction as making a conclusion from observations, evidences or facts, and where the conclusion is only a working hypothesis. The working hypothesis does not necessarily depict a very strong relationship (i.e., cause and effect relationship) when compared to deduction approach. The phenomenological research tradition often undertakes a detailed analysis of a small number of subjects, and takes account of the social or environmental context (Saunders et al., 1997). In contrast, the positivistic research tradition, with its emphasis on replicability, focuses on doing research on a ‘representative’ larger number of subjects. Despite the above distinctions, Bryman and Bell (2007) highlights the need not to see the two philosophical research traditions (and their counterpart research approaches – deduction/induction) as totally mutually exclusive. Most research done within the social sciences research fields tend to fall within the continuum between the two extremes.

2.3. Research strategy

Research strategy is a general research plan that includes “clear objectives derived from research questions, sources for data collection and corresponding constraints” (Saunders et al., 1997: 74). Saunders et al. (1997) lists among many, three main research strategies; experiments, surveys, and case studies. An Experiment is done to measure a certain number of variables of selected sample subjects in different experimental conditions. A Survey is normally done to collect a large number of data using standardized means, while a Case Study is used to develop intensive and detailed knowledge in a small number of subjects (Saunders et al., 1997; Sekaran, 2003). Two other ways of conducting research are described as either cross-sectional study or
longitudinal study (Cooper and Schindler, 2003; Saunders et al., 1997; Sekaran, 2003). A Cross-sectional study is a research strategy on particular phenomena that is done at a particular time. A longitudinal study focuses on examining changes in the phenomena under study over a particular period of time. It tracks changes over some time period.

In most practical researches, multi-methods approaches are often adopted to cancel out the different method-effects on any one particular study. As indicated by Saunders et al. (1997), multi-methods have two advantages. Firstly, combining different research methods would serve different purposes in the same study. Secondly, a multi-method approach can help in undertaking “triangulation”, which helps in validating what the researcher thinks the data is telling him or her.

2.4. Research types

Apart from using research strategies as a means to categorize different forms of research, research work can also be categorized in terms of the research types. The three often used types are; exploratory, descriptive and explanatory (Cooper and Schindler, 2003; Sekaran, 2003). Exploratory studies aim to “find out what is happening, to seek new insights, to ask questions and to assess phenomena in a new light” (Robson, 1993, as quoted in Saunders et al., 1997: 97). They are usually undertaken to gain a better understanding of the research topic, either because not enough prior studies have been undertaken in that particular research field or in a particular physical location (Sekaran, 2003: 119). Normally, qualitative data collection is done using mainly interviews and observations. Descriptive research, as the name suggests, aim at profiling the various characteristics of the phenomenon under study. Data analysis often involves putting data collected into predetermined categories. Explanatory studies normally focuses on cause-effect relationships. Often there is some effort to test one or more hypothesis (Sekaran, 2003; Saunders et al., 1997). In explanatory studies, both qualitative and quantitative data are often used.

2.5. Locating our study

In this thesis, our aim is to explore, describe and analyze interproject learning mechanisms and project competencies of consultancy firms (as Project-based firms) in Sweden. As an exploratory, qualitative study, this research tilts towards the phenomenological research tradition. The study is exploratory because we are seeking to expand our knowledge of interproject learning mechanisms and project competencies of consulting firms in Sweden, while at the same time going beyond a study of a single case. Extensive literature search on past interproject learning studies could not reveal any research that has examined consulting firms in Sweden, from the perspective that they are ‘project-based firms’. We found only one study on two global management consulting firms (i.e., Accenture and Cap Gemini Ernst & Young) that have offices in Sweden. This study, however, examines these two global companies using the ‘Knowledge Management’ perspectives. The data collected for our study is based on ‘perceptions’ of subjects (i.e., experienced project management practitioners), in an attempt to capture and understand their view of their ‘working-world’. On the other hand, we do include some aspects of the positivism approach, in that we start our research by adopting some hypothetic-deductive steps. We start by exploring the literature review (theory), develop research questions for a questionnaire, which we then test (by administering it to respondents/subjects), and then analysis
the data to deduce some conclusions (Sekaran, 2003: 29). It is also a cross-sectional study, since it is not possible to conduct a longitudinal study given the time and resources constraints.

Our study emphasize the perceptions of ‘key’ informed project management practitioners (i.e., Project coordinators, Project managers, Programme managers, General managers, Project Directors, Project Sponsor, etc). These ‘sampling elements’ all have experience of some aspects of managing projects. Their perceptions about project activities in their respective firms would help have some resemblance of a ‘managerial’ view, as well as, provide ‘expert’ opinion. We also focus on only one sector (Consulting services sector) to control for sectoral impact on project practices.

Initially, the research design aimed at collecting data using two methods; interviews at one or two consultancy firms, and a survey using an almost fully structured questionnaire. This approach would have enabled us to do some triangulation of the data collected. However, we could not get access to any consulting company, to enable us to do some interviews. In the end, we only managed to run a survey questionnaire.
Chapter 3: LITERATURE REVIEW – INTERPROJECT LEARNING MECHANISMS & PROJECT COMPETENCIES

3.1. Introduction

This chapter aims to examine and summarize relevant literature that covers knowledge, learning and project competencies in project-based firms. We draw literature from diverse fields of study, including studies on organization learning, strategy, evolutionary economics, and project management. Some of the strategy literature consulted covers the ‘resource-based view’ and ‘knowledge-based view’ of the firm. We start the literature review by examining the ‘historical’ evolution of various thought-line that has eventually led to the association between knowledge accumulation or learning and project competencies. Because knowledge and its continuous accumulation is considered to be a strategic assets that determines the competitiveness of today’s firms, we focus in the next section with examining in detail the definitions of knowledge, its types, and how it can be generated, stored, distributed and reused in an organizational context. After this general literature survey, we then focus on examining the literature on interproject learning and project competencies in project-based firms. Towards the end of the literature review, we pull the various strands from different conceptual frameworks covered in the literature, to develop our own research model that guides the rest of the study.

3.2. Conceptual development of the association between Knowledge accumulation/Learning and Project Competencies

The conceptual framework that forms the background to the rest of the study lays at the intersection of a number of well known perspectives associated with Organizational learning, knowledge management, dynamic capabilities, and project management. These include the resource-based view of the firm, knowledge-based view of the firm, and the capability-based perspectives (Easterby-Smith and Prieto, 2008; Hoopes and Madsen, 2008; Zollo and Winter, 2002). The main conceptual connection underpinning all the three perspectives is the importance of knowledge (& its continuous upgrading) as a critical success factor in today’s competitive and volatile markets. In discussing the three above perspectives, we adopt a number of theoretical models, including the Easterby-Smith and Prieto’s framework (see Figure 1 below). These theoretical models explain the underlying foundation for the various perceptions that have been developed on interproject learning and its role in strengthening the competitiveness of PBFs.

The resource-based view of the firm has its origin in evolutionary economics and industrial organization/microeconomics (Barney, 2001). The traditional resource-based view (RBV) focuses on possession of unique resources or assets (physical, human, organizational) as basis for creating competitive advantage (Prieto and Easterby-Smith, 2006). The RBV theory argues that a “firm’s competitive advantage may be best explained by the heterogeneity of firm-specific resources and their application” (Almor and Hashai, 2004: 481). It is the abilities to configure and reconfigure these resources in ways that are difficult for competitors to imitate or neutralize, which makes the firm competitive in the market place. The knowledge-base view (KBV) of the firm goes a bit further, by focusing on the importance of intangible resources, especially knowledge-based resources (Gassmann & Keupp, 2007). For the KBV of the firm, it is the heterogeneity in knowledge possessed by different firms that determine their differential performance in the market place. The underlying idea is that superior market performance is
based on abilities of a particular firm to perform certain knowledge-based ‘value-adding’ activities and processes, distinctly better than the competition. For such knowledge-based abilities or capabilities to provide sustainable competitive advantage, they need to be inimitable, based on rare and unique nontransparent resources (especially unique innovative problem-solving skills/abilities), diffused across the different layers of the firm, and must be embedded in the collective and idiosyncratic social structures, culture(s) and dynamic routines of any organization (Long and Vickers-Koch, 1995). The latter point is necessary for ‘causal ambiguity’ – a precondition critical to stopping or slowing down imitation by competitors. As shown in Figure 1, the KBV would emphasize the importance of refining the various learning processes to handle both exploration learning (i.e., creation of new knowledge through experimentation and problem-solving) and exploitation of new knowledge (i.e., the transfer of new acquired knowledge to the rest of the organization or new application). Most recent knowledge literature has considered both organizational knowledge and knowledge transfer across the firm as critical for competitive capabilities and dynamic competitiveness in a changing business environment.

Johnson et al., (2008: 107) defined organizational knowledge as “collective experience accumulated through systems, routines and activities of sharing across the organization”. Organizational knowledge can either be explicit or tacit knowledge. Explicit knowledge is codified and can be transferred using formal systems. In contrast, tacit knowledge is ‘personal and situation specific’, and can only be transmitted by person-to-person sharing of experience, rather than in more formalized ways (Bueno et al., 2008). Explicit knowledge can be documented easily, whereas tacit knowledge is more difficult to articulate and exists at a subconscious level. It is the tacit knowledge which is based on the shared experiences of members within an organization that can facilitate or help organizations achieve competitive capabilities that are hard to imitate (Johnson et al., 2008).

Figure 1: Linking learning processes, knowledge management and dynamic capabilities to sustained market performance
Source: Easterby-Smith and Prieto (2008: 243)
Recent literature on knowledge transfer has identified different strategies of managing the transferring of knowledge across the various sections/functions/divisions of any organization. Hansen et al. (1999: 107) identified two knowledge management strategies. The first one is the ‘codification strategy’, where new “knowledge is carefully codified and stored in databases, where it can be accessed and used easily by anyone in the company”. The second one is the ‘personalization strategy’, where new “knowledge is closely tied to the person who developed it and is shared mainly through direct person-to-person contact” (ibid). This is also supported by Lindkvist et al. (2002), as quoted in Williams (2003: 449), who argue that specific knowledge management and physical structures/processes are needed to collect, transfer and store explicit knowledge, while an “organizational infrastructure enabling a distributed network memory” is required to transmit tacit knowledge.

The knowledge-based view of the firm did take some sway for sometime, especially with its emphasis on knowledge (or the ability to uniquely combine various streams of knowledge) as basis for building capacity to create and add customer value. However, in today’s rapid evolving dynamic environments, having the ‘right’ knowledge at any particular point in time does not necessarily guarantee continued market success. That is where the concepts of dynamic capabilities and dynamic competitiveness come-in. As briefly discussed in the section on definitions of concepts, a number of definitions have been given for these two concepts. As shown in Figure 1 above, dynamic capabilities are required to deal with market dynamism. Dynamic capabilities are developed through an iterative feedback-loop mechanisms on both the new knowledge developed during the management of production processes and the ‘Knowledge Management’ system put in place to formalize the ‘flow’ of new knowledge across the whole organization. It is this interactive process of developing new knowledge, integrating it with existing organizational knowledge, and transferring the new knowledge across the whole organization that enhances the adaptive capabilities of the firm. As shown in Figure 1, this continuous process results in reconfiguration, re-combinations and continuous upgrading of operating routines and organizational resources, which in turn, lead to new product/service offerings that keep-up with changes taking place in the market. Figure 2 indicates that dynamic capabilities are presented as first-order change capabilities that integrate and reconfigure skills, knowledge, experience, and organizational routines in the context of specific firm-level characteristics. In other words, building dynamic capabilities involves double-loop learning, instead of single-loop learning.

While the three theoretical perspectives provide a lot of insights on how to retain sustainable competitive advantage in the face of continuously changing market environment, it is important to realize that these perspectives were developed for firms that have functional or matrix organizational forms. However, most project work or PBFs do not operate with such forms of organizational structures and processes. For one, projects or project work is temporal. A project team is normally constituted once a project is conceptualized, and disbanded at project closure. Competencies, skills and knowledge accumulated during the execution of the project can easily be dispersed when everyone on the project team go their separate ways. Any PBF must, therefore, develop deliberate strategies that aim to retain as much of the knowledge, competencies and capabilities accumulated once the project is over. Despite the above mentioned dangers (i.e., knowledge and skills loss) to a firm’s competitiveness, project forms of work-organizing are getting more wide application across a number of industries (Söderlund, 2005). This trend is
partly because of the imperative to keep up with market changes and the various characteristics (or strengths) of organizing work as projects.

![Diagram of Capability Hierarchy](image)

**Figure 2: Capability Hierarchy**

*Source: Hoopes and Madsen (2008: 398)*

Söderlund (2005) develops a project competence framework model which shows that for PBFs, they need to address four core building blocks (or sub-processes/activities), in order for such firms to be competitive in the market. The four core sub-processes identified are; Project generation, Project organizing, Project leadership, and Teamwork (see Figure 3 below). Project generation deals with ability to effectively undertake pre-bidding activities, bidding and project selection activities. Various firms use different techniques to undertake and manage these activities. Project organizing involves structuring an effective project organization with required competencies needed to undertake project execution efficiently. Project leadership goes beyond the capacity and competences of the project manager. It includes the leadership capabilities at all levels of the organization. Collective capacity is required to both supply necessary input resources, as well as, support, motivate and coordinate various projects running concurrently in a project-based firm. Lastly, Project team work focuses on available skills within the project team, coordination of various activities, synchronizing interdependent processes, and communication among the various stakeholders.

More than anything else, Figure 3 indicates the need to synchronize the project competencies that are inside the firm to match the demands of the market, as well as, requirements to manage the project context, environmental uncertainties and issuing complexities.
3.3. **Knowledge types & Knowledge transfer**

3.3.1. **Definition of Knowledge**

A number of definitions of the concept ‘knowledge’ are given in the literature. Most of the definitions are often discussed in the context of differentiating between data, information and knowledge (Shapiro, 1999). The dictionary defines ‘data’ as “facts and statistics used for reference or analysis” (Compact Oxford English Dictionary, 2006: 250). This includes numbers, sounds, raw images, and sounds, which are the result of measurements or observation (Hislop, 2005). Information is data arranged systematically in some way to have a recognizable pattern (Jashapara, 2004). Knowledge is, however, more than information or data. Knowledge is perceived as ‘actionable’ information (ibid). In other words, knowledge enables people to determine relationships between events or actions, thereby providing a means to understand and analyze given data or information (Hislop, 2005). Knowledge provides the context within which information and data can be interpreted. Information only becomes knowledge “when one is able to realize and understand the patterns and their implications” (Udeaja et al., 2008: 840). Equally important, knowledge enables the ability to predict future outcomes based on available information and data (Jashapara, 2004). In this research, we adopt the definition of knowledge given by Davenport, Long and Beers (1998). They define knowledge as “information combined with experience, context, interpretation, and reflection” (ibid: 43). At an organizational level, knowledge is actionable and meaningfully interpreted information that adds value to a firm’s operations.

3.3.2. **Knowledge Types**

A more detailed epistemological and philosophical discussion of all knowledge types is beyond the scope of this research paper. It is, however, important to acknowledge the existence of a number of researchers who disagree with the idea of breaking down ‘knowledge’ into distinct and neat categories (Hislop, 2005). For example, Blackler (1995) observes that:
“….. it is a mistake to assume that embodied, embedded, enbrained, encultured and encoded knowledge can sensibly be conceived as separate from each other. Knowledge is multi-faceted and complex, being both situated and abstract, implicit and explicit, distributed and individual, physical and mental, developing and static, verbal and encoded” (Blackler, 1995: 1032).

While acknowledging the complexity, multidimensional and complementary nature of ‘knowledge’, for practical and manageability purposes, we restrict most of our discussion in this research to the generally acceptable dichotomous classifications found in a number of past literature [i.e., tacit vs explicit, individual vs group/team level, codification vs personification, etc] (i.e., Ibert, 2004; Jasimuddin et al, 2005; Shapiro, 1999). Understanding the distinction between the different knowledge types helps in determining which mechanism(s) would be more appropriate when attempting to transfer such knowledge.

### 3.3.2.1. Tacit vs Explicit Knowledge

Knowledge can be classified either as Tacit or Explicit (Jasimuddin et al., 2005). The distinction between the two knowledge types is summarized in Table 1 below. Tacit knowledge relates to what we know but can not verbalize (Nonaka and Takeuchi, 1995). It is personal (i.e., embedded in human brains) and is acquired through action or practical experience within a particular context. Such knowledge includes ability to generate unique insight from data or information, hunches, intuitions, etc. (Nonaka and Konno, 1998). Because tacit knowledge is difficult to express in words, it is hard to codify and transfer from one person/group to another or across the whole organization. Tacit knowledge is transferred mainly through observation, face-to-face interactions, and/or imitation (Fong, 2003). Nonaka and Konno (1998) breaks tacit knowledge further into two distinct categories; technical knowledge (i.e., know-how), and cognitive knowledge (i.e., values, mental modes, beliefs, ideals). Explicit knowledge, on the other hand, is said to be formal and easy to articulate into words. It is also considered to be impersonal, in the sense that it can be separated from the person who has such knowledge. Consequently, such knowledge is easy to codify into tangible forms and transfer across individuals or groups. In the context of projects, examples of codified knowledge includes project manuals/documents, project status reports, e-files, drawings, and various databases. Information and communication technology (ICT) is often used in the storage and transfer of explicit knowledge.

<table>
<thead>
<tr>
<th>Tacit knowledge</th>
<th>Explicit knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inexpressible in a codifiable form</td>
<td>Codifiable</td>
</tr>
<tr>
<td>Subjective</td>
<td>Objective</td>
</tr>
<tr>
<td>Personal</td>
<td>Impersonal</td>
</tr>
<tr>
<td>Context specific</td>
<td>Context independent</td>
</tr>
<tr>
<td>Difficult to share</td>
<td>Easy to share</td>
</tr>
</tbody>
</table>

*Table 1: The Characteristics of tacit and explicit knowledge
Source: Hislop (2005: 19)*

The above dichotomy might be misleading about the true nature of knowledge in the real world. Often knowledge does not fall at the extreme ends of tacit or explicit dimensions. Most knowledge possessed by firms is often a combination of explicit and tacit knowledge – in various
permutations. For example, Connell, Connell et al. (2003) argue that most studies overemphasize the tacit-explicit dichotomy, and that such emphasis might be misplaced. Organizational knowledge can, therefore, be better seen as existing within a continuum between the two extremes. Figure 4 provides a more realistic visualization of knowledge that exists in organizations. Different methods can be used to capture and transfer knowledge depending on whether it’s characteristics leans predominantly towards the tacit or explicit end-axis. Alternatively, different methods can be used in combinations to capture and transfer knowledge that falls within the middle band of the tacit-explicit axis.

![Figure 4: Tacit and Explicit knowledge](Source: Udeaja et al. (2008: 840))

### 3.3.2.2. Individual vs Group/Collective Knowledge

The second categorization of knowledge types widely used in the literature, is the individual-group dichotomy. This categorization is often used within the debates on whether knowledge exists only at the individual level or can be consisted by groups. The distinction is often associated with literature on learning organizations or organizational learning. Some researcher privileged the individual knowledge over organizational knowledge, since it is the individuals who undertake the learning (Hislop, 2005). However, there is enough evidence that suggest that groups or organizations can learn or acquire knowledge that is ‘qualitatively’ different to what can be acquired by individual effort. In that sense, group-based or organizational knowledge is much more than the sum ‘total’ of knowledge possessed by various individuals. The importance of synergy, contextual and social factors are critical to group/organizational knowledge. In project context, the multi-disciplinary nature of project team members provides a unique opportunity for combining diverse perspectives, resulting in creative problem-solving and new innovations. Knowledge created and held at group- or organizational-level operating in a particular context is also often seen as socially constructed. Such knowledge is viewed as “a set of shared beliefs that are constructed through social interactions and embedded within the social contexts in which knowledge is created” (Fong, 2003: 480). At the organizational level, knowledge is underpinned by unique organizational norms, values, routines and processes. Such
knowledge can prove problematic when attempting to transfer knew learning from one unit to other units in an organization, especially if a large physical distance exists between groups.

3.3.3. Mechanisms for Knowledge Transfer

Knowledge transfer can take place between organizations (inter-organizational) or within the organization (intra-organizational). In our study, we are more focused on knowledge transfer between different units within the same organization. Thus, knowledge developed or accumulated within one unit (be it a project group, department or division) is being transferred to affect the workings of another unit (Argote and Ingram, 2000). In such a context, organizational knowledge transfer has been defined as:

“… the process through which organizational actors – teams, units, or organizations – exchange, receive and are influenced by the experience and knowledge of others. Since organizational knowledge transfer requires the integration of differentiated knowledge, it manifests itself through changes in the knowledge bases or performance of recipients” (Van Wijk et al., 2008: 832).

As given in the above definition, the objective of knowledge transfer is to modify the behavior of the recipient(s) in some way, ideally improved problem-solving capacity, ability to meet performance objectives or increased productivity. Firms with greater capacity to more effectively transfer knowledge from one unit to other units located within the same organization tend to be more productive, and have a great chance of survival (Argote and Ingram, 2000; Baum and Ingram, 1998). Van Wijk et al. (2008: 830) takes note of increasing evidence supporting the view that enhanced “internal knowledge transfer across organizational units” has greater competitive impact on respective firms. A number of factors will influence the effectiveness by which knowledge can be transferred between the knowledge source and the knowledge recipient within an organization. Connell et al. (2003) outlines four factors that might influence the difficulties associated with intra-organizational knowledge transfer. These four factors are:

(i) The characteristics of the knowledge to be transferred;
(ii) The characteristics of the ‘source’ of the knowledge;
(iii) The characteristics of the ‘recipient’ of the knowledge;
(iv) The context within which the knowledge transfer is taking place.

The first factor given by Connell et al. (2003) above - the characteristics of the knowledge to be transferred - refers to the complexity, ambiguity and tacitness of knowledge (ibid). The more complex the knowledge, the more difficult it is to transfer between individual employees or groups. The complexity might be ‘technical’, but it would also include the number of ‘elements’ that need to be mastered for the knowledge to be usable in a new context. Some knowledge may not only be complex, but might have been developed and embedded with a particular organizational cultural context. The ambiguity of knowledge focuses on the ‘cause and effect’. It might be that new knowledge developed within a particular organizational unit (i.e., project team) did indeed work to solve a particular problem. However, the underlying causality might still be less understood by the team that developed the knowledge. Thereby causing difficulties in determining how the new knowledge would be applicable in a different context. As discussed earlier, tacitness refers to the degree of articulability and embeddedness (Landaeta, 2008). It is, therefore, easier to envisage a situation where more explicit knowledge is easier to transfer, relative to more tacit knowledge. Knowledge that exhibit all the three characteristics -
complexity, ambiguity and tacitness – can prove very difficult or even impossible to transfer across individual employees or work groups. Such knowledge will inevitably exhibit some ‘stickiness’, preventing knowledge spillovers to the organization’s outside constituents, and can be a source of enduring competitiveness if it provides a firm with a distinctive advantage (Argote et al., 2000).

The second and third factors given by Connell et al. (2003) above, are in a lot of ways linked. For knowledge transfer to take place, the knowledge source (be it an individual employee or work group) need to be willing to share the new knowledge with other employees or the whole organization. Employees or work groups that have developed new knowledge (i.e., a new practice that improve operational performance) might not be willing to share the new knowledge with other employees or work groups. Huber (2001) takes note of the fact that the ‘knowledge possessor’ may not be so willing to share knowledge if it affects her or his competitive advantage relative to other (competing) employees. It is, therefore, important for any organization to look at how it can encourage its employees to share new knowledge across the different levels in the organization. The characteristics of the ‘recipient’ are equally important in facilitating knowledge transfer across employees or organizational units. The knowledge recipient must value the significance of new knowledge to the effectiveness of his/her work, have the absorptive capacity to make sense of the new knowledge, have motivation to invest energy in seeking out new knowledge (i.e., not suffer from the ‘not-invented-here syndrome’), know where to find the relevant knowledge, and how to access it (Connell et al., 2003; Huber, 2001).

The last factor – context within which the knowledge transfer is taking place – refers to the total organizational environment where the knowledge transfer is taking place. This may include the organizational culture (i.e., having a learning culture or not), organizational structures, and idiosyncratic processes and routines [i.e., flexible and open functional boundaries, easy of access to knowledge sources, and the existence or lack of appropriate ICT infrastructure in facilitating capture, storage, transfer and reuse of new knowledge] (Lam, 2005; Tan et al., 2006). The last factor may also have to do with the existence of appropriate incentives that promotes knowledge sharing across the whole organization. Not all incentives will motivate all categories of employees in different circumstances. What is critical is to tailor the ‘right’ incentives to the contexts and targeting appropriate employees. And incentives do not need to always be cash-related. Huber (2001) cites from a study done by Rappleye (2000), giving an account of non-cash incentives (i.e., personal pride in one’s work & recognition by peers) that can encourage organizational members to share the newly acquired knowledge with the rest of the organization:

“In these communities [of practice] whose world is their work team – five to ten people in a local geographical area – the opportunity to become known as thought leader, to have solved a difficult problem that nobody else had ever seen, and to be personally identified with the solution, before all Xerox reps, all over the world, was enough to incentivy them to take the time to write up their solution, and put it into the knowledge base” (Rappleye, 2000: 60, as cited in Huber, 2001: 74).

Different authors have different categorizations of knowledge transfer mechanisms used within firms. In general, however, these categorizations seem to be related to different strategies adopted by firms to ensure knowledge sharing within and across organizational units. Broadly, two strategies have been identified in the literature: Personification strategies and Codification strategies (Jasimuddin et al., 2005). As given in a model developed by Jasimuddin et al. (2005),
the two strategies are shown in Figure 5 below. Personification strategies tend to be used by organizations which view knowledge as being primarily possessed by individual or group of employees, and that such knowledge is inseparable from such employees. Such strategies tend to focus on transfer of tacit knowledge (Connell et al., 2003). They also emphasize face-to-face communication and social interactions between employees. Companies that mainly use Codification strategies view knowledge as separable from employees who developed or possess the knowledge. Consequently, they emphasize putting in place processes that can capture and codify new knowledge, before it is transferred to the knowledge recipient within the firm. This strategy, however, tend to be more suited in transferring explicit knowledge (ibid).

![Diagram of knowledge strategies](image)

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Typology</th>
<th>Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explicit Knowledge</strong></td>
<td>Codification Strategy</td>
<td>No loss of knowledge due to labour turnover (+) (Hall and Andriani, 2003)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protection through IPRs (+) (Ainscowell, 1997)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Easy to communicate (+) (Grant, 1996)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Easy to store (+) (Nosen et al., 1996)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Huge investments in IT (-) (Eginton, 1995)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Large space to keep documents (-) (Bontis, 2002)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High rates of imitation by competitors (-) (Hall and Andriani, 2003)</td>
</tr>
<tr>
<td><strong>Symbiosis strategy</strong></td>
<td></td>
<td>The Basis of Competitive Advantage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low rate of imitation (+) (Spencer, 1995)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No investments in IT (+) (Johannesen et al., 2001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High rate of innovation (+) (Alvesson, 2001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sense of Ambiguity (+) (Hall and Andriani, 2003)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult to communicate (-) (Ainscowell and Bowmen, 2001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Difficult to store (-) (Cornell et al., 2003)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reluctant to share knowledge (-) (Sauterneck, 1995)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No protection through IPRs (-) (Twice, 1995)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss of knowledge due to labour turnover (-) (Boiral, 2002)</td>
</tr>
</tbody>
</table>

**Note**: + and - indicate positive and negative effects respectively

**Figure 5: Possible organizational implications of knowledge strategies**

*Source: Jasimuddin et al. (2005: 106)*

The two distinction strategies shown in Figure 5 lead to two classes of knowledge transferring mechanisms. Jasimuddin and Zhang (2008) uses slightly different (but corresponding) terms to those shown in Figure 5, to describe the two classes of knowledge transferring mechanisms; soft mechanisms versus hard mechanisms. The distinction between these two groups of mechanisms and examples of companies that use each group type are shown in Table 2. Companies that predominant use ‘soft mechanisms’ focus on transferring tacit knowledge. Transfer of tacit knowledge relay less on technology and more on social interactions and networking (i.e., observation of experts working, practical mentorship, attending brainstorming camps, insertion into social networks, face-to-face interface, storytelling, training, etc). The challenge for companies is to provide space for and restructure work processes, so as to promote these social- and context-based interactions (Argot and Ingram, 2000). As shown in Table 2, McKinsey and
Bain & Company are given as examples of companies that extensively use ‘soft mechanisms’ in transferring knowledge across the organization. Companies that use the ‘hard mechanisms’ emphasize the transfer of explicit or codifiable knowledge. Consequently, such mechanisms rely heavily on using ICT supported technology to transfer large volumes of information and knowledge quickly across multiple destination points within the organization. ICT-based tools such as email, Groupware, Internet, electronic bulletin boards, voice mail, and Intranets are widely used to transfer explicit knowledge (Jasimuddin and Zhang, 2008). Table 2 gives examples of companies like Ernst & Young and Anderson Consulting, which are perceived as using predominantly ‘hard’ mechanisms when transferring internally generated knowledge across the organization.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Knowledge transfer mechanisms</th>
<th>Soft mechanism</th>
<th>Hard mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature of knowledge</td>
<td>Tacit</td>
<td>Explicit</td>
<td></td>
</tr>
<tr>
<td>Role of technology</td>
<td>Insignificant (if any)</td>
<td>Technology focused</td>
<td></td>
</tr>
<tr>
<td>Role of people</td>
<td>People focused</td>
<td>Little</td>
<td></td>
</tr>
<tr>
<td>Examples</td>
<td>Communities of practice, Person-to-person interface, Social network, storytelling</td>
<td>Intranets, e-mail, groupware, data warehousing</td>
<td></td>
</tr>
<tr>
<td>Name of the firm using</td>
<td>McKinsey; Bain &amp; Company</td>
<td>Anderson Consulting; Ernst &amp; Young</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Distinguishing features of soft and hard mechanisms of knowledge transfer
Source: Jasimuddin and Zhang (2008: 3)

It is important to emphasize that the distinctions shown in Table 2 and Figure 5 must not be taken too rigid. Most knowledge used in work environments have a combination of tacit and explicit knowledge. In reality, most companies use a combination of ‘soft’ and ‘hard’ mechanisms to transfer knowledge across individual employees or work-groups. Soft and hard knowledge transfer mechanisms must, therefore, be seen as complementary to each other rather than as substitute.

### 3.3.4. Knowledge conversion processes

As shown in Figure 6, Fong (2003) identified the various processes in the creation of organizational knowledge, that leads to cycles of benefits, with each cycle illustrating the interrelationships between explicit and implicit knowledge. He re-arranged the three modes of knowledge creation which are “knowledge sharing, knowledge integration, and collective project learning” into four modes of knowledge creation. Figure 6 shows a dynamic process where tacit knowledge and explicit knowledge are transformed. Fong (2003) regards “knowledge sharing” as a process taking place by “socialization” (without language) and “externalization” (with language). “Combination” is in related to “knowledge integration” and “internalization” is associated with “collective project learning” (ibid). Each of the four components of knowledge conversion processes are discussed briefly below.
<table>
<thead>
<tr>
<th>Tacit Knowledge</th>
<th>Explicit Knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socialization= Sharing and creating tacit knowledge through direct experience</td>
<td>Externalization= Articulating tacit knowledge through dialogue and reflection</td>
</tr>
<tr>
<td>Explicit Knowledge</td>
<td>Combination= Systemizing and applying explicit knowledge and information</td>
</tr>
<tr>
<td>Internalization= learning and acquiring new tacit knowledge in practice</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 6: Knowledge conversion processes**

*Source: Fong (2003: 481)*

### 3.3.4.1. Socialization (Tacit to Tacit knowledge)

Socialization is described as the process of conversion from tacit knowledge to new tacit knowledge, by the means of experiences sharing on a day to day basis (Nonaka and Konno, 1998; Nonaka and Toyama, 2003). As indicated by Nonaka and Konno (1998), socialization has two aspects, which are; capturing tacit knowledge and disseminating tacit knowledge through knowledge sharing. Fong (2003: 481) defined socialization as “a valuable mode of sharing knowledge in teams without language through imitation, observation and sharing experiences face-to-face”. This process is also a way to facilitate trust between partners (Nonaka and Konno, 1998; Nonaka and Toyama, 2003). Moreover, Nonaka and Toyama (2003) emphasized that in a socialization process, individuals capture and share the tacit knowledge of the ‘world’ they are living in and how they are experiencing that particular ‘world’. Individuals exchange tacit knowledge through joint activities without explicit expression. Self-participation is the fundamental concept in socialization (Nonaka and Konno, 1998).

### 3.3.4.2. Externalization (Tacit to Explicit knowledge)

Externalization is the articulation from tacit knowledge into explicit knowledge, which then could be shared in the future (Nonaka and Konno, 1998; Nonaka and Toyama, 2003). Fong (2003: 481) referred to externalization as an elemental tool to “trigger the unconscious elements of knowing and not-knowing”, and to “reveal the gaps in knowledge compared to what the community knows”. Externalization has two critical aspects which are tacit knowledge articulation and the tacit knowledge translation into understandable explicit forms (Nonaka and Konno, 1998). In this process, individuals make deliberate attempts on rationalizing and articulating the tacit knowledge to make tacit knowledge explicit and synthesized (Nonaka and Toyama, 2003: 5). A number of researchers agree that that in this process, the commonly used
tool is dialogue and language, which is necessary when sharing work-related expertise (Fong, 2003; Nonaka and Toyama, 2003).

3.3.4.3. **Combination (Explicit to Explicit knowledge)**

Leonard-Barton (1995) refers knowledge creation as the combination of previously unconnected or connected elements to create new insights. Combination involves the conversion from explicit knowledge into more synthesized and complex knowledge (Nonaka and Konno, 1998; Nonaka and Toyama, 2003). Nonaka and Konno (1998: 45) also indicated three key processes in combination stage, which are ‘capturing and integrating new explicit knowledge, dissemination of explicit knowledge, and processing of explicit knowledge’. According to Fong (2003: 482), combination - which is part of knowledge integration – refers to the process of ‘mixing’ knowledge from within and outside the project team, and there is a positive relationship between the level of knowledge differentiation needed and the level of combination. Nonaka and Toyama (2003) introduced computer-based networks and database as some of the approaches needed to facilitate combination of knowledge.

3.3.4.4. **Internalization (Explicit to Tacit knowledge)**

Internalization converts the explicit knowledge into tacit knowledge, where knowledge has become the basis for the new routines when it is used in real situations (Nonaka and Konno, 1998; Nonaka and Toyama, 2003). Nonaka and Konno (1998) defined two dimensions for internalization which are; embodying explicit knowledge in practice and embodying explicit knowledge in experiments to generate new knowledge. Fong (2003) defined internalization as a way to ensure the future creation of tacit knowledge from internalizing learning from organizational activities at the project-team level, which involves individual’s participation in learning-by-doing. This requires individuals to identify relevant and useful knowledge for themselves among an array of explicit knowledge (Nonaka and Konno, 1998). In the internalization process, Nonaka and Toyama (2003) recommended learning by doing as an important method to realize the conversion from explicit knowledge into tacit knowledge.

Having analyzed the knowledge conversion processes and learning in general terms, we now turn to learning, knowledge accumulation and transfer within a particular environment – the project environment.

3.4. **Interproject Learning**

3.4.1. **Interproject learning model**

The concept of project learning is derived mainly from the literature on organizational learning (Kotnour, 2000). The underpinning theoretical perspective is that organizational competencies (in our case, project competencies) are built-up through various learning processes (Söderlund, 2005). In the context of project work, project-learning must not be seen as an automatic by-product of the project (Ayas, 1997). In other words, “learning … has to be managed together with the project and must be integrated into project management as standard practice” (Ayas, 1996, as quoted in, Schindler and Eppler, 2003: 225). A typical project must, therefore, have two outputs; (i) the actual end-product/service delivered by the project, and (ii) a post-project
assessment of what has been ‘learnt’ during the project (Cooper et al., 2002). For this to happen, however, there must be deliberate efforts to invest resources (money, time, effort, structures, etc) in structuring a project environment that promote systematic retention of knowledge and insights gathered during a project (Schindler and Eppler, 2003; Cooper et al., 2002). Otherwise, there is a real danger that transferable project insights gained may be lost once the project is completed, the project team gets disbanded, and individual project team members move in different directions (Brady and Davies, 2004). To avoid such knowledge loss, there is need for firms to have a more structured approach that incorporates systematic ‘reflective practices’ on project experiences (Soderlund et al., 2008).

Project learning is a multifaceted concept, involving a number of activities at different levels of an organization. Project learning takes place at the level of an individual employee, project team, across project teams, a single organization and/or a group of firms working on a particular project. Lampel et al. (2008) identifies four levels of project-related learning and knowledge activities; interorganisational, intraorganizational, interproject, and intraproject learning. Interorganizational project learning refers to knowledge that is transferred across several project-based firms working on a single project. On very large projects (e.g., the development of the Airbus A380), one is likely to see a number of companies working together to complete a particular project. As these firms interact with each other, project knowledge is shared across firms. Intraorganizational project learning refers to a situation where various departments, functions or divisions of a firm are called upon to support and contribute their expertise to the delivery of a particular project. Interproject and intraproject learning have already been discussed before, and refers to knowledge creation and flow that takes place across projects and within each project team, respectively. It is also possible that the nature and depth of learning that takes place at all the four different levels given above is qualitatively different (Boh, 2007).

The focus of all learning and associated knowledge accumulation activities is, of course, to strengthen project competencies required to be competitive in the long term. Interproject learning, therefore, focused on the accumulation of relevant knowledge, skills and experiences needed by firms to efficiently and effectively execute current and future streams of projects (Newell and Edelman, 2008; Lee, 2008). With the risk of over-simplification, interproject learning can be presented diagrammatically as shown in Figure 7 below. In Figure 7, interproject learning is facilitated by a deliberate incorporation of post-project reviews into the project management methodology underpinning project execution. The new experiential knowledge acquired from the execution of Project A & Project B is captured in status, stage gate, and post-project review reports. This accumulated knowledge is then deposited into the Organizational Knowledge-base Repository or databases. This approach to knowledge accumulation needs to also take account of the tacit and contextual knowledge which might not be captured in official post-project reviews (Kasvi et al., 2003). For example, it might be that a particular solution implemented when countering a particular difficulty during the project execution may have been chosen due to the unique contextual environment. It is, therefore, important to point out the contextual environment under which particular decisions were made. Knowledge of ‘why’ particular solutions where selected in past projects can help future project teams to know whether some past solutions are relevant to their current challenges. The emphasis must, therefore, be put on capturing both tacit and non-tacit knowledge, experiences and expertise generated during the execution of a project (Boh, 2007). Institutionalization of individualized knowledge sharing mechanisms – which captures tacit/contextual knowledge - is therefore equally important in
supporting project learning (ibid). Project history and story telling during project review meetings can also facilitate in the transfer of such tacit knowledge.

As shown in Figure 7, both the project planning and execution of Project C ought to draw on ‘lessons learned’ from the planning and execution of Project A & Project B. It can be argued that the project competence to effectively execute Project C is enhanced from the successes and failures that were experienced during the execution of previous projects. Past ‘lessons learned’ impact the project planning stage of Project C, but also directly during the execution stage. Ultimately, the iterative lessons learnt during the execution of all the three projects (A, B, C) should inform and improve the planning and execution of all future projects. Put differently, projects play dual roles; utilizing accumulated knowledge from past projects to improve current and future project execution, as well as, upgrading the accumulated ‘knowledge-base’ in light of new lessons gleaned from ongoing projects (Lampel et al., 2008).

There are major benefits that can accrue from enhancing interproject learning for project-based firms. These include; enhanced project competence to undertake a series of successful future projects, reduced costs due to avoiding repeating past mistakes, reduced project risk, better coordination between concurrent-running projects, and enhanced competitiveness (Ayas, 1997; Kotnour, 1999; Cooper et al., 2002). However, for these gains to materialize, interproject learning needs to be undertaken strategically, supported by deliberate investment of resources, take account of project context, be systematic and structured (Newell and Edelman, 2008; Kasvi et al., 2003).

### 3.4.2. Interproject Learning Mechanisms

As already discussed above, it is difficult to create, store and share knowledge and learning across projects. Thus, with the assumption that project teams should learn and share learning from the previous projects to improve their efficiency, interproject learning mechanism could be identified as practices which are attempted to retain lessons learnt on a project and reuse them by other projects (Raelin, 2001). Moreover, Prencipe and Tell (2001: 1380) extended the discussion of learning mechanisms to “learning landscape”, defined as “the mix of project-to-project
learning mechanisms adopted and implemented”, which considered that firms’ approaches to interproject learning are multidimensional. This multidimensional analysis of interproject learning mechanisms is in terms of two dimensions, which enables a detailed analysis of different methods that firms deploy for interproject learning. Based on their empirical studies of six project-based firms, Prencipe and Tell (2001: 1381) suggested that a “learning landscape” includes the various learning mechanisms adopted by project-based firms to “accumulate experience, and to articulate and codify knowledge at the individual, project (or group) and organizational levels”.

The “learning landscape” is categorized into three types, which are “explorer landscape, the navigator landscape, and the exploiter (or stair-case) landscape” (Prencipe and Tell, 2001: 1382). The explorers are defined as firms relying greatly on people-embedded knowledge which emphasize experience accumulation, while still exploring different project learning approaches in terms of knowledge articulation and codification processes. The navigators are firms that start implementing interproject learning mechanisms based on the knowledge articulation process from the individual to organizational level. The exploiters have ready developed advanced ICT-based methods to support their interproject learning mechanisms. Their focus is deliberate knowledge codification process which could codify and store knowledge from previous projects to make it exploitable for the rest of the organization. While acknowledging the importance of explorer and navigator learning landscape and all the learning mechanisms at the individual level, the focus of this study would be on learning mechanisms at project- and organizational-level. Learning at project- or organizational-level involves four processes: Experience accumulation, Knowledge articulation, Knowledge codification, and Knowledge reuse (see Figure 8).

3.4.2.1. Experience accumulation

Organizational learning is dependent on historical experiences which are stored as tacit and programmatic routines, the reflection of the experience that has accumulated overtime and outcome of trial and error (Levitt and March, 1988; Nelson and Winter, 1982). Senge (1990) defined experience accumulation as means of depending on individuals with their accumulated experiences moving from one project to another. Therefore, the experience accumulation and learning process is local and related to existing routines lacking conscious volition (Nelson and Winter, 1982). Similarly, Levinthal and March (1993) pointed out the risk of “myopia” such as “capability trap and superstitious learning” which could be attributed to the fact that there is often a tendency for organizations to deploy the existing routines as solution to problems encountered. However, Zollo and Winter (2002) emphasizes that these experience accumulation and organizational routines are fundamental for firms, because the routines create the possibility of automatic behavior (Penrose, 1959), and enable efficient coordination and specialization. Zollo and Winter (2002) also admitted that experience accumulation, which is informal and less systematic, is not as effective as knowledge articulation and knowledge codification in facilitating firms’ capability development and enhancement.

Experience accumulation could be achieved through individual sharing experiences from past projects, resulting in interproject learning even though it is “a haphazard way to improve a dynamic project working capability” (Newell and Edelman, 2008: 584). However, knowledge articulation and knowledge codification, which involve more cognitive efforts and resources,
<table>
<thead>
<tr>
<th>Level of analysis</th>
<th>Experience accumulation</th>
<th>Knowledge articulation</th>
<th>Knowledge codification</th>
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</thead>
<tbody>
<tr>
<td>Individual</td>
<td>On-the-job training</td>
<td>Figurative thinking</td>
<td>Diary</td>
</tr>
<tr>
<td></td>
<td>Job rotation</td>
<td>&quot;Thinking&quot; aloud</td>
<td>Reporting system</td>
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<td></td>
<td>Specialization</td>
<td>Scribbling notes</td>
<td>Individual design</td>
</tr>
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<td></td>
<td>Re-use of experts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group/Project</td>
<td>Developed groupthinking</td>
<td>Brainstorming sessions</td>
<td>Project plan/audit</td>
</tr>
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<td></td>
<td>Person-to-person</td>
<td>Formal project reviews</td>
<td>Milestones/deadlines</td>
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<td></td>
<td>communication</td>
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<td></td>
<td>Informal encounters</td>
<td>De-briefing meetings</td>
<td>Meeting minutes</td>
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<tr>
<td></td>
<td>Imitation</td>
<td>Ad-hoc meetings</td>
<td>Case writing</td>
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<td>Lessons learnt and/or</td>
<td>Project history files</td>
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<td></td>
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<td>post-mortem meetings</td>
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<td></td>
<td>Intra-project</td>
<td>Intra-project lessons</td>
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<td></td>
<td>correspondence</td>
<td>learnt database</td>
</tr>
<tr>
<td>Organizational</td>
<td>Informal</td>
<td>Project manager camps</td>
<td>Drawings</td>
</tr>
<tr>
<td></td>
<td>organizational routines, rules and selection processes</td>
<td></td>
<td></td>
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<td></td>
<td>Departmentalization and specialization</td>
<td>Knowledge retreats</td>
<td>Process maps</td>
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<tr>
<td></td>
<td>Communities of practice</td>
<td>Professional networks</td>
<td>Project management process</td>
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<td></td>
<td></td>
<td>Knowledge facilitators and managers</td>
<td>Lessons learnt database</td>
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<td>Interproject</td>
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<td></td>
<td></td>
<td>correspondence</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Interproject meetings</td>
<td></td>
</tr>
</tbody>
</table>

Figure 8: Interproject learning mechanisms
Source: Prencipe and Tell (2001: 1381)
have a more important function related to developing interproject learning capabilities (Zollo and Winter, 2002). As shown in Figure 8, experience accumulation processes include individual employees being put on on-the-job training, job rotation, specialization and re-use of experts (Prencipe and Tell, 2001).

3.4.2.2. Knowledge Articulation

Knowledge articulation represents a deliberate involvement in interproject learning processes, when compared to informal experience accumulation (Nonaka and Takeuchi, 1995; Zollo and Winter, 2002). Zollo and Winter (2002: 341) defined knowledge articulation as “deliberate process through which individuals and groups figure out what works and what doesn’t in the execution of an organizational task”. As indicated by Zollo and Winter (2002), knowledge articulation has two functions; as a context for justification and a cognitive process with deliberation which poses a possibility of capturing causality and feasibility in different tasks (Nonaka and Takeuchi, 1995; Tell, 1997, 2000; Grand and Von Krogh, 2000).

Knowledge articulation is described as learning by thinking and learning by reflecting (Schon, 1983). It is also referred to as learning-by-discussing and learning-by-confronting (Argyris and Schon, 1978), when compared to learning-by-using and learning-by-doing in experience accumulation processes. As shown in Figure 8, several mechanisms could be used for knowledge articulation such as reviews, meetings, and brainstorming. Similarly, Newell and Edelman (2008: 570) describes project meetings and reviews on the project team level as developing a common understanding of what makes a successful or unsuccessful project. However, from their case studies and quantitative analysis, there is no direct relationships between knowledge articulation alone and interproject learning, while knowledge articulation is important as a precursor to knowledge codification, which is discussed below.

3.4.2.3. Knowledge Codification

In project based firms, the ability to codify tacit knowledge can ease the transfer of knowledge and improved the efficiency of firms and organizational learning (Prencipe and Tell, 2001). As indicated above, knowledge codification is an extension of knowledge articulation (Zollo and Winter, 2002). It is necessary to articulate knowledge first in order to codify knowledge, which means knowledge articulation precedes knowledge codification (Newell and Edelman, 2008). Cowan and Foray (1997: 596) defined knowledge codification as “the process of conversion of knowledge into messages that can be processed as information”, which takes the form of messages, rules and relationships (Kogut and Zander, 1992; Ancori et al., 2000). Foray and Steinmueller (2001) suggested two functions for knowledge codification. The first is to store and transfer knowledge, and the second is to transform the underlying knowledge in the systems. In accordance with this line of thought, Ancori et al. (2000: 258) identified that “the cognitive and organizational mechanisms are very important”.

Prencipe and Tell (2001: 1379) describes knowledge codification mechanisms as learning-by-writing and re-writing. Newell and Edelman (2008) argues that knowledge codification is achieved by documenting project experiences, so as to eventually transfer learning to other projects. They discuss the case of ‘staircase shaped project-based firms’ which emphasis deliberate knowledge codification during the implementation phase of projects, for easier access
and exploitation of generated knowledge. These types of firms have already developed ICT-based methods to transfer and exploit project knowledge, through the use of reports, minutes, lessons learnt, etc., as codified knowledge for future use. They also admitted that some knowledge is hard to codify, while knowledge articulation and codification could still help firms identify success factors for projects.

### 3.4.2.4. Knowledge Reuse

As codified knowledge is mainly deployed to facilitate the routine replication, the real economic benefit of knowledge codification is primarily in knowledge reuse (Prencipe and Tell, 2001: 1379). Zollo and Winter (2002) also identified that firms learn by implementation, replication and adaptation of codified knowledge. Based on Prencipe and Tell’s (2001) empirical case studies, employees in project-based firms are supposed to re-use all relevant codified knowledge from previous projects. During this knowledge reuse process, formal tools which are considered as enablers of knowledge reuse could be deployed, such as intranet and informal meetings with other project managers or project team members. Project team members can make use of these formal and informal tools and approaches to identify whether lessons which have been learnt are useful on their current project, in order to reuse relevant knowledge (Newell and Edelman, 2008). In Newell and Edelman’s (2008) paper, they argued a positive relationship between documentation or knowledge codification and interproject learning.

### 3.4.3. Building Project Competencies through investment in continuous learning

Anbari et al (2008) observes that projects offer organizations an opportunity to learn and build-up their project management processes. During project execution, as project teams struggle to develop new solutions to encountered problems, they develop new knowledge of what works and does not work, and why? Such knowledge, if captured can help in building the project knowledge base of the organization. But for this to happen, deliberate processes, procedures and routines need to be in place, to support continuous learning and knowledge development at all three levels of the company (i.e., individual-, project-, and organizational-level). However, a more holistic understanding of project competence-building requires that one understand the complexities associated with the generation, capturing, storage and re-use of knowledge within a project environment (Brady and Davies, 2004; Kasi et al., 2008).

According to Soderlund (2005: 456), project competencies should have at least the following four characteristics:

(i). Should be capable of application across different project types.
(ii). Related to having a holistic approach to projects (i.e., capacity to generate good project ideas, as well as, good project execution).
(iii). Must underpin strategic competitive project operations, that are continually adaptive to technological and market dynamics.
(iv). Must be built upon clear ‘key’ building blocks or activities.

In a market environment that is relentlessly changing, project-based firms need to be continuously reconfiguring their bundles of project competencies, while at the same time getting rid of those which are no longer relevant (Lindkvist, 2008). In order to achieve this, Landaeta (2008) argues that firms need to continuously develop and upgrade three types of knowledge;
technical project knowledge, problem-solving knowledge, and continuous improvement knowledge. The later is critical, as it enables the “continuous improvements of project tasks” (ibid: 34). In the long run, it is such continuous improvement and learning activities that determine the competitive advantage of project-based firms. As quoted in Suikki et al. (2006: 724): “In the long run, the only sustainable source of competitive advantage is your organization’s ability to learn faster than its competitors”.

3.4.4. Organizational infrastructure to support interproject learning

Internal organizational infrastructure is a key way for organizations to capture knowledge and experiences with projects, and firms should scrutinize routines to realize behavior and performance improvements (Nelson and Winter, 1982). In reality, organizations gain the learning by the means of transforming inferences from the history into routines which will guide organizational behavior (Levitt and March, 1988). Anbari et al. (2008) suggested project management structures should accelerate the information flow; PMO (Project Management Office) must manage and control projects across the firm, and multi-functional project teams have to implement projects. Aryris and Schon (1978) outlines the ‘enablers’ which are useful in facilitating organizational learning; including flat and decentralized organizational structures, information systems for information flow, systems of incentives, boundary crossing and openness. Since the end of 1950s, researchers consider it important to conduct project reviews ‘formally’ in a structured way (Weinberg and Freedman, 1984). More and more researchers recommend ‘project post-mortem’ (Collier et al., 1996; Collison and Parcell, 2001; McMasters, 2000; PMI, 2000) or a ‘retrospective’ (Kerth, 2000) as a means to document both the positive and negative experiences. In line with this, Collier et al. (1996) suggested a standardized process for post-project reviews (PPRs), including documenting procedures, communication channels, blame free analysis, and a balance of the benefits and costs of PPRs. Apart from these formal structured ways, it is suggested that informal ways such as seminars, staff meetings, and ‘communities of practice’ should allow the procedure-oriented culture to permeate the firm, needed to improve project and firm performance. It has been agreed by researchers that a ‘learning culture’ is critical for organizational learning, which is open, receptive, co-operative, people-based and supportive (Newell et al., 2002; Prencipe and Tell, 2001; Schein, 1992). Moreover, Collier et al. (1996) especially emphasized that management commitment is required to make interproject learning a mainstream activity, and firms should establish an incentive structure to support the accumulation of experience, articulation of new knowledge and codification of knowledge needed to enhance interproject learning (Prencipe and Tell, 2001).

3.4.5. Research Model for the study

Pulling the various strands of the literature covered above, we now outline the various strands that are of focus in our study. These are shown in Figure 9. In short, we are interested in exploring the perceived nature and linkages between interproject learning mechanisms and Project competencies, with the organizational learning infrastructure playing a mediating role. We have to acknowledge that the ‘visual presentation’ masks a complex process with various feedback loops.

As discussed before and shown in the Research model in Figure 9, the process of developing project competencies involve generation, capturing and sharing of new project knowledge at
three levels of learning processes. These processes interact with four deliberate ‘secondary’ processes at the project and organizational level (i.e., experience accumulation, knowledge articulation, knowledge codification, and knowledge re-use). On top of these activities, investment in developing and continuously upgrading project competencies is conditioned by the existing organizational learning-supporting infrastructure.

**Interproject Learning Processes**

- Individual-level learning processes
- Group-level learning processes
- Organizational-level learning processes

**Organizational learning infrastructure**

**Interactive Knowledge Conversion Processes:**
- Experience accumulation
- Knowledge articulation
- Knowledge codification
- Knowledge re-use

**Project Competencies**

*Figure 9: Research Model*

*Source: Developed from the Literature review by the authors*
Chapter 4: RESEARCH DESIGN

4.1. Introduction

This chapter outlines the research design for this study. It outlines the underlying assumptions of the various decisions that were undertaken, including the selection of the sector to be covered in the research and how data was collected. The research design adopted for the study was one judged to be more appropriate to answer the research questions. The chapter begins by examining the underlying assumptions of the study.

4.2. Underlying Research Assumptions

After extensive literature search, we could not find any study on Consultancy sector in Sweden, that covered consulting firms from the fact that there are ‘project-based firms’. We did find only one study that covered two global management consulting firms that had offices in Sweden (Werr and Stjernberg, 2003). The study by Werr and Stjernberg (2003) covered Accenture (formerly Andersen Consulting) and Cap Gemini Ernst & Young (formerly Ernst & Young Management Consulting). However, their study covered the two companies from the ‘Knowledge Management’ perspective. Like most other studies from the ‘Knowledge Management’ perspective, they covered the two firms as permanent organizations. The ‘project-based firm’ perspectives, however, takes account of the fact that certain firms (though permanent) may be running a series of activities (i.e., projects) which have a definite start and end date. As observed by Kasvi et al., (2003), the management of knowledge and learning in project-based organizations is not yet fully developed. Because our study is the first on consultancy firms in Sweden, using the ‘project-based firm’ approach, we opted to undertake an exploratory, qualitative investigation.

The consultancy sector was chosen for our study because of two main reasons. Firstly, most past researches on project-based firms have focused on companies from the various engineering/science-based sectors, manufacturing industry, and/or construction-related industries. Secondly, the consultancy sector is a knowledge intensive sector. It is one of the key sectors for knowledge-based developed economies. As observed by Lampel et al. (2008), while knowledge is a key factor in sustaining competitive advantage, it is also increasingly being subjected to continuous erosion due to faster technological change and market competition. The need to continuously update, create and build newer knowledge bases on which to compete is therefore important. Such processes of continual renewal are even more critical to knowledge-intensive sectors like consultancy.

4.3. Preconceptions

Interest in the subject ‘interproject learning’ was first developed during the first semester of this Masters degree program at Heriot-Watt University in Edinburgh, UK. The interest was developed during the Research Methodology course taught at Heriot-Watt University, where each student was expected to develop a research proposal and course-based research paper. One of the two authors had developed a research proposal and course-based paper related to project learning. The course-based paper was later refined and evolved into a research paper. The interest in the topic of interproject learning was further enhanced by a short course that was
delivered during the semester spent at Politecnico di Milano. The short course – Project-based Innovation and Knowledge Management - was run in June 2008, by Professor Robert DeFillippi of Sawyer Business School, Suffolk University, USA.

Because of this earlier interest in the research topic on interproject learning, the authors were able to start this thesis with reasonable knowledge of the relevant literature. Of course, prior research interest on a particular topic can have an impact on how the research is done, and how much dedication is given to the thesis effort. Both authors of this thesis are attending the Masters in Strategic Project Management [European] at Umea University, and will be graduating in January 2009.

4.4. Purpose of the study

The purpose of the study can determine both the method adopted to do the research and the types of data collected. This study sets out to explore the nature and extent to which various interproject learning mechanisms were applied in consulting firms in Sweden and the types of project competences developed. It also examines the organizational infrastructure put in place to support and promote interproject learning. The study focuses much on knowledge creation, capture, storage and reuse within the organization (intraorganizational learning) rather than knowledge flow across different organizations (interorganizational learning).

4.5. Research Approach

There were broadly two main ways to undertaking our study; longitudinal study or cross-sectional study. We could have conducted a ‘longitudinal study’, which would involve examining the investment various consulting firms were making in different interproject learning mechanisms, and how such invest impact on project competencies over time. Due to time constraints, such a study was not feasible in our case. Alternatively, we could undertake the study as a cross-sectional study, with either a large sample or smaller sample. Since our study is exploratory, the latter option was chosen. The aim was to capture the major facets of interproject learning mechanisms and project competences among consulting firms in Sweden. Findings from our study could form a base for anyone in future who would want to conduct a large scale survey, whose objective would be more explanatory in nature. The research approach had seven steps: literature review, development of research objectives and research questions, definition of the target sample, administering of the questionnaire, data collection, data analysis and discussion of results, and writing up of recommendations/conclusions.

4.6. Unit of analysis and Sample characteristics

The unit of analysis in this study are the ‘processes’ of transferring new knowledge generated within projects (i.e., during the execution of a project) to other projects or other sections of the parent organization. The sampling frame was created by searching the web for consulting firms in Sweden, especially those firms with their own website. The rationale was that consulting firms which have their own websites on internet would more likely have ‘formal’ project management processes. Moreover, it was a much easier way to create a sampling frame, taking account of the language barriers. Firms were drawn from management consulting, financial/auditing/accounting consulting, and technical/engineering consulting subsectors.
The ‘sampling element’ is any project management practitioners in consulting firms (i.e., project coordinator, project manager/assistant project manager, program manager, project director, etc.). Our study captures ‘expert’ perceptions of project management practitioners from consulting firms, who have practical experience of running and managing projects. Watson and Hewett’s (2006) study on MNCs consulting firms also uses perceptions of respondents, instead of objective indicators to capture the transfer of knowledge within organizations.

The questions in the questionnaire were developed partly from the literature review, as well as, adopted (& adapted) from past questionnaires used by other researchers. A number of questions were adopted (& some times adapted) from sample questionnaires used by other researchers (i.e., Kotnour, 1999, 2000; Lampel, 2001; Landaeta, 2008; Newell and Edelman, 2008). Other questions were, however, developed from the literature review. The questionnaire was largely a close-ended questionnaire, with four subsections; General questions, Interproject learning mechanisms, Project competencies, and Learning Infrastructure and Postmortem Reviews. The questionnaire was kept to a maximum length of three pages, to enhance the response rate. The length of a questionnaire is normally negatively related to the response rate. We expected the closed nature of most questions in the questionnaire would contribute to enhancing reliability of the study. We therefore expect only minor variation in answers given to individual questions, if the same questionnaire was administered to the same respondents at a different time period.

A total of forty eight (48) questionnaires were either posted, emailed or handed-out to respondents from consulting firms. 8 questionnaires were handed-out in person to project management practitioners who had attended the PMI Swedish Chapter seminar at Umea University. Thirty one (31) questionnaires were mailed by post. Nine (9) questionnaires were emailed to consulting firms. The strategy for the emailed questionnaires was to ask the ‘sampling element’ of each firm to answer the electronic questionnaire, and return back the filled-in questionnaire as an email attachment. There are both advantages and disadvantages of using an e-mailed questionnaire as one of the data gathering instrument. The advantages include reduced stationary, printing, postage and data entry costs, and fast delivery (Burkey and Kuechler, 2003). The disadvantages include the following; sample selection/coverage biases, negative impact on response rate due to junk mail effect and internet security concerns, and the relatively low knowledge (currently) available on how to improve e-mail surveys (Couper, 2000). Studies that compare the response rate of web-based surveys relative to other survey methods (i.e., mail surveys, telephone surveys, etc.) have produced mixed results. For example, Kaplowitz et al., (2004) find that the response rates from web-based surveys is relatively lower than other survey methods. However, Huang (2006) quotes a study done by Tuell (2003), which shows that web-based surveys have a comparable or even higher completeness relative to other survey methods. This is especially so, when web-based surveys are preceded by a mailed pre-notice (Kaplowitz et al., 2004). Consequently, in our study, prior to emailing the questionnaires, the companies where contacted by either telephone or email, informing them of the forthcoming questionnaire.

Of the 48 questionnaires administered to consulting firms, only 9 were returned, representing a return rate of almost 19%. While a higher return rate is desirable, our exploratory study is not focusing too much on getting a representative sample. The main focus is to seek out ‘expert’ opinion from respondents, and try to find out whether there are any patterns that can be detected, which can then be carried forward in future research. A number of follow-ups efforts were made,
using telephone calls and emails. Due to the fact that one questionnaire had a lot of subsections that were not completely filled-in, the analysis focuses on only the remaining eight (8) usable questionnaires. Maybe with extra more time, the researchers would have got a bigger return rate.

As an exploratory study, we adopt largely a qualitative approach in analyzing the data. In addition, our exploratory study was focused on soliciting perceptions of project management practitioners (as expert opinion holders). In part, because of the small sample, but also because we are analyzing perceptions, the qualitative data analysis approach is seen as the most appropriate.

Of the 8 respondents, 3 were currently project managers, 2 were project coordinators, 2 were at the director in their respective firms. 1 respondent did not name his/her position in the company. The respondents had practical experience of working on projects that ranged from 5 to 25 years. With the exception of 1 respondent, others did not seem to want to identify the name of their companies and opted to identify the sector in which their company was located. Of the 8 respondents, 3 where from management consulting firms, 1 from financial/accounting consulting firm, 3 identifying themselves as involved in technical/engineering consulting subsector. One respondent did not identify either his/her company name or sector.

4.7. **Ethic considerations**

Ethical issues have to be considered throughout the research process, encompassing activities such as “data collection, data analysis, reporting, and dissemination of information on the internet, if such an activity is undertaken” (Sekaran, 2003: 18). Saunders *et al.* (1997:109) defined ethics as the “appropriateness of your behavior in relation to the rights of those who become the subject of your work, or are affected by it”. Cooper and Schindler (2003: 135) considered ethics as “norms or standards of behavior that guide moral choices about our behavior and our relationships with others”. It is also defined by Sekaran (2003: 17) as “a code of conduct or experienced societal norm of behavior while conducting research”. Ethical conduct must be exhibited when the researcher interacts with either the sponsors the research, other stakeholders, and/or the respondents who provide data and information (Sekaran, 2003).

Some of the ethical issues that needs to be addressed in any research related to the need to avoid any harm to respondents due to them taking part in the research or from research results, ensuring that respondents are ‘informed’ participants in the study, that there is no invasion of their privacy, and no coercion or deceit is used by the researcher (Bryman and Bell, 2007; Cooper and Schindler, 2003; Saunders *et al.*, 1997). The second set of ethical issues which need to be addressed in any research, has to do with the materials used when writing-up the thesis. It is important to acknowledge all primary and secondary sources of materials and information used during the research. Secondary sources included academic books related to our research topic, academic journal articles, academic commentaries, course materials, and other web-based materials available in various databases.

To ensure that our study meets the ethical standards, the followings steps were undertaken; (i) the identities of all respondents and their respective organizations are not revealed in the thesis, (ii) all the respondents were informed in the covering letter and at the end of the research questionnaire that their confidentialities would be respected, (iii) ensuring that all respondents
were free not to answer the questionnaire if they so wished (or free to discontinue at any one time), and lastly, (iv) every effort has been made to acknowledge all sources of secondary literature or thought-lines, by ensuring proper citation and referencing.
Chapter 5: DATA ANALYSIS

5.1. Introduction

This chapter analyses responses from the questionnaires that were returned. The main objective of the chapter is to try to answer the research questions as set out in Chapter 1. The data analysis is arranged following the order of the three research sub-questions covered in this study. We, therefore, discuss the answers to each research question in sequence. The analysis starts with examining the ranking of interproject learning mechanisms used by consulting firms to transfer lessons learned that have accumulated on a particular project to other projects or the rest of the parent organization.

5.2. Mechanisms of transferring ‘lessons learned’ to other projects

While there is a long list of various mechanisms used to transfer lessons learned found in the literature, the authors of this dissertation selected those which are assumed to be more commonly applied. There was an option for respondents to state any other interproject learning mechanism(s) that may not have been listed in the question. The results are shown in Table 3. The results are derived from responses to Q4 in the questionnaire. While it is important to be cautious in making wide-spread generalization from a small sample, the result shows a few (weak) patterns among the answers provided by the 8 respondents.

In general, the highly ranked interproject learning mechanisms are those that involve face-to-face transfer of project knowledge across projects. The two most important and critical ones are; (i) the transfer of experienced project personnel to new projects, and (ii) the person-to-person informal discussion with work colleagues involved in other projects. The result suggests that project knowledge in consulting firms involves some degree of tacit knowledge. Such knowledge is more likely to be conveyed by personal interactions, practice-induced conversations, and through observations of experienced co-workers (Landaeta, 2008; Newell et al., 2006; Zedtwitz, 2002). In addition, the culture in consultancy firms require employees to work together to solve particular problems. Often various consultants would be working on various projects at the same time. The ability for experienced consultants to have their ‘feet’ in more than one project at a time can help in diffusing best practices across several projects. In addition, the nature of consulting projects often requires putting together a project team whose members have complementary skills. The interdependence required to deliver a particular project within limited time period puts an imperative for enhanced face-to-face interactions (Koch, 2004; Marks and Lockyer, 2004).

The third and fourth important transfer mechanisms are; (i) Project documents and (ii) De-briefing meetings. These two transfer mechanisms tend to be critical at the start and (often) end phase of each consulting project, respectively (Schindler and Eppler, 2003). Any project during its life cycle tends to generate a lot of different documents (i.e., feasibility studies, business case, technical reports, user manuals, status reports, review documents, test reports, etc.) that can be used in future projects (Kasi et al., 2008). At the planning phase, project documents (of both past projects and the current project) are used to compile estimates of project parameters (i.e., types of activities required to complete particular tasks, duration estimates, activity costs, etc). Past historical data of similar activities done in the past can act as a guide when estimating future
project activities’ time and cost estimates. Debriefing workshops can be held at any time during the project life cycle, even though most of them tend to be held when the project is completed. The study by Schindler and Eppler (2003) find that most debriefing sessions at the end of the project tend to have very limited focus on documenting what was learned during the project, but more on reallocation of project team members back to their former functional departments, transfer of responsibilities, hand-overs, etc. For debriefing sessions to contribute to learning, they need to be focused on what can be improved on past performance, rather than on assigning blame or on what went wrong. These two mechanisms seem to be good opportunity to bring-in past lessons to bear on new projects, as well as, improve the organization’s ability to manage projects successfully (Reich, 2007). Either way, these two knowledge transfer mechanisms tend to be incorporated in a number of (formal) project management methodologies. To what extent they incorporate lessons from past projects may be hard to judge. What is known from the responses given by respondents is that they play second fiddle to two face-to-face project knowledge transfer mechanisms discussed earlier.

<table>
<thead>
<tr>
<th>No</th>
<th>Means of transferring ‘lessons learned’ on one project to other projects</th>
<th>Average score of raw ranking*</th>
<th>Ranking of average score</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Project documents (i.e., project manuals, status reports, process maps, surveys, etc)</td>
<td>3.71</td>
<td>3</td>
</tr>
<tr>
<td>ii</td>
<td>De-briefing meetings</td>
<td>4.29</td>
<td>4</td>
</tr>
<tr>
<td>iii</td>
<td>Person-to-person informal discussion with work colleagues involved in other projects</td>
<td>2.25</td>
<td>2</td>
</tr>
<tr>
<td>iv</td>
<td>Cross-staffing of experienced project team member(s) to a new project</td>
<td>1.13</td>
<td>1</td>
</tr>
<tr>
<td>v</td>
<td>Use of ‘Lessons learned’ database</td>
<td>5.57</td>
<td>6</td>
</tr>
<tr>
<td>vi</td>
<td>On-going project review meetings (i.e., milestone/stage-gate reviews, review workshops, project team meetings, etc)</td>
<td>6.17</td>
<td>7</td>
</tr>
<tr>
<td>vii</td>
<td>Recruitment of external expertise to be part of project team</td>
<td>8.67</td>
<td>9</td>
</tr>
<tr>
<td>viii</td>
<td>Ad-hoc meetings</td>
<td>10.67</td>
<td>11</td>
</tr>
<tr>
<td>ix</td>
<td>Post-project reviews (i.e., Case writing, use of external auditors, project history files, etc)</td>
<td>7.57</td>
<td>8</td>
</tr>
<tr>
<td>x</td>
<td>Informal organizational routines (i.e., project team/managers’ camp outings, central meeting place, storytelling sessions, etc)</td>
<td>5.75</td>
<td>5</td>
</tr>
<tr>
<td>xi</td>
<td>Groupware/intranet &amp; Forum (i.e., micro articles by email, request for information, etc)</td>
<td>9.29</td>
<td>10</td>
</tr>
<tr>
<td>xii</td>
<td>Others, please specify:</td>
<td>(2)**</td>
<td></td>
</tr>
</tbody>
</table>

* = Sum of total rankings in a particular cell/Number of respondents who ranked the item
** = Only one respondent ranked this item as the 2nd highest. For practical purposes, we ignore this row.

Table 3: Mechanisms of transferring ‘lessons learned’
Source: Survey data

What was surprising from the responses shown in Table 3, was the relatively low ranking of knowledge transfer mechanisms that can be used to transfer ‘explicit’ project knowledge across projects. The three mechanisms of interest here are; (i) use of ‘lessons learned’ database, (ii) Post-project reviews, and (iii) Groupware/intranet & forums. The use of ‘lessons learned’ database is, on average, ranked 6th in importance. The ranking in importance of both ‘post-project reviews’ and ‘Groupware/intranet & forums’ tends to tilt toward the bottom of the list. The importance of ‘lessons learned’ databases as a means to transfer knowledge across projects
seem to be ranked, in general, higher than the use of post-project reviews or Groupware/intranet. The result might suggest that the respondents seem to perceive ‘lessons learned’ drawn from databases to have a more direct impact on new projects, in a way that the other two latter options are not. It is also possible that post-project reviews when undertaken are not perceived as knowledge transfer mechanisms, than the need to meet minimum project documentation requirements (Schindler and Eppler, 2003). The relatively very low ranking of ‘Groupware/intranet & forum’ as a means to transfer project knowledge across projects might have to do with the weakness of such transfer channels. Generally, ICT based systems are good at transferring large quantities of information faster and cheaper across various access points. However, moving information across multiple access points is not necessarily the same as transferring new knowledge.

The relatively low ranking of ‘on-going project review meetings’ seem to be based on the core utility of such meetings. It is probably true to say, such meetings are used as ‘tools’ geared towards the control of on-going project activities, rather than as a mechanism to transfer knowledge across projects.

Having analyzed the relative importance of the various mechanisms used by consulting firms to transfer knowledge across projects, we now turn to how interproject learning is associated with building project competences. In other words, which project competencies are build-up through interproject learning processes.

5.3. Perceived association between Interproject Learning and Project Competencies

It is important to be upfront and acknowledge that our analysis here does have limitations. The analysis does not identify individual interproject learning mechanisms and link them to particular type of project competencies. Despite this limitation, the 8 responses do provide insight on the relative effectiveness of interproject learning efforts among sampled consulting firms in developing certain project competencies. It might be that certain interproject learning mechanisms support the development of certain project competencies, while not being good at strengthening other types of project competencies. A much more refined analysis (& questionnaire) is required to identify which (& why) certain specific learning mechanisms do support the development of some project competencies, while not supporting the build-up of others.

The survey results of the perceived impact of interproject learning on project competencies are shown in Table 4. The results are derived from Q7 in the questionnaire. The respondents were asked the extent to which they agreed or disagreed with each statement given in Table 4. They had to rank their answers on a scale of 1 to 5 (5 = strongly agree, 4=agree, 3=neither agree or disagree, 2=disagree, 1=strongly disagree). The number of respondents who ticked each box is shown in respective cells in the table. For example, of the 8 respondents, only a single respondent disagreed (ranked 2 on the scale) with the statement suggesting that interproject learning enhanced the ability of his/her company to assess complex and fluid project situations. 5 respondents were neutral to whether interproject learning enhanced the ability of their consulting companies (or project teams) to assess complex and fluid project situations. Two (2) respondents, however, agreed that interproject learning enhanced the capacity of their project teams/companies to assess complex and fluid situations. While it is not possible to generalize
from these answers, it is possible to say that – at least from the companies represented in the survey results – most respondents weren’t fully convinced that interproject learning taking place in their respective firms enhanced their ability to assess complex and fluid situations. There may be a number of explanations to such an outcome. It maybe that interproject learning processes have either; (i) not yet been fully implemented in most of the respective consulting companies, (ii) have not been properly implemented, and/or (iii) that elements of interproject learning processes implemented have little effect in enhancing this particular project competence (i.e., enhancing the ability to assess complex and fluid situations).

<table>
<thead>
<tr>
<th>No</th>
<th>Interproject learning has enhanced the following Project Competencies:</th>
<th>1 Strongly disagree</th>
<th>2 Neutral</th>
<th>3 Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Ability to assess complex and fluid situations</td>
<td>1</td>
<td>5*</td>
<td>2</td>
</tr>
<tr>
<td>ii</td>
<td>Better estimates of project costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Better estimates of schedules</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Better estimates of project risks</td>
<td></td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>v</td>
<td>Ability to adapt project structure to new work processes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Improved cost efficiencies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vii</td>
<td>Abilities to meet project objectives (i.e., cost, schedule and performance requirements)</td>
<td>3</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>viii</td>
<td>At project start, project teams have a better understanding of what could go wrong</td>
<td>5</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>ix</td>
<td>When starting a new project, project teams have a better understanding of the right work methods to follow to ensure project success</td>
<td></td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>x</td>
<td>Ability to adjust team dynamics to unforeseen contingencies</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>xi</td>
<td>Transferring of new knowledge quickly to other projects</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>xii</td>
<td>Ability to satisfy our customer(s)</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>

* = Number of respondents who ticked each cell

Examining the whole of Table 4 seems to give out a few patterns. All the 8 respondents seem to agree that interproject learning has enhanced the capacity to make better estimates of ‘hard-core’ project variables that are part and parcel of any ‘traditional’ project management methodology. 3 respondents and 5 respondents agree or strongly agree that interproject learning has enhanced abilities of their project teams to make better estimates of project costs and schedules. This is not necessarily surprising. Insights gained on the ‘right’ size of resources needed to accomplish certain ‘work packages’ can help in making better estimates of resource requirements in similar work packages in future projects. This is a result of benefits derived from ‘economies of repetition’ (Davies and Brady, 2000). What is surprising, however, is the fact that most respondents don’t see interproject learning as contributing to enhancing the capacity of respective consulting firms’ project teams to make better estimates of project risks. 7 of the 8 respondents are either neutral or disagree to the suggestion that interproject learning had enhanced the ability to make ‘better estimates of project risk’. At one level, the responses from the respondents make sense. The ability to make better estimates of project risks may require more skills and knowledge than what can be accumulated through practical experience gained on
working on successive projects. On the other hand, the ability to make better estimates of a lot of project parameters (i.e., ability to make better estimates of resource requirements for particular work packages) – gained through practical experience - aught to enhance the capacity to reduce overall project risks.

When we examine the middle section of Table 4, we can see that most respondents are either neutral or disagree with the assumption that interproject learning had a positive impact in enhancing the development of what can be referred to as 2\textsuperscript{nd} order or ‘dynamic’ project competencies. Most respondents either are neutral or disagree that interproject learning has enhanced the ability of their firms/project teams to adapt project structures to new work processes, improve cost efficiencies, ability when starting a new project to have a better understanding of what could go wrong, or had enhanced their abilities to meet project objectives (i.e., cost, schedule and performance objectives). Enhancing some of these project competencies is, however, key to strengthening the dynamic capabilities of firms needed to deal with evolving project targets or deal with uncertain project environments (Newell and Edelman, 2008).

An examination of the last three rows in Table 4 suggests a mixed picture. On one hand, 6 of the 8 respondents seem to agree or strongly agree that interproject learning has enhanced the ability to adjust team dynamics to unforeseen contingencies. On the other hand, 5 out of 8 respondents were either neutral or disagreed with the statement that interproject learning has enhanced the abilities of respective firms to satisfy their customers. This later result may, however, not be very surprising when one examines the answers given to the eleventh item in Table 4. Seven (7) out of 8 respondents were either neutral or disagreed that interproject learning activities in their respective firms had strengthened their ability to quickly transfer new project knowledge created to other projects. This result suggests deficiencies associated with the ‘maturity’ and effectiveness of learning processes put in place to support interproject learning. To understand the limitations to learning processes, we examined activities and processes associated with Project planning and Execution stages of the project life cycles in respective consulting firms. Question 6 in the questionnaire was used to capture activities relevant to project planning and execution stages.

### 5.4. Embeddedness of project learning processes during Project planning and Execution phases

The objective of Q6 in the questionnaire was to evaluate how project learning processes were embedded within project work packages associated with the project planning and execution phases. The survey results are shown in Table 5. The respondents were asked the extent to which they agreed or disagreed with each statement given in Table 5. They had to rank their answers on a scale of 1 to 5 (5 = strongly agree, 4 = agree, 3 = neither agree or disagree, 2 = disagree, 1 = strongly disagree). The number shown in each cell in Table 5 shows the number of respondents who ticked each box.

While cautious of the problem of small sample, it is still possible to see some (limited) patterns among the responses from the 8 respondents. With regards to the Project Planning stage, 5 respondents agree or strongly agree that project teams in their organizations review past project plans when making project plans for new projects. Three (3) respondents were neutral to the statement that their firms consult past project plans during the project planning stage. However,
answers by respondents were slightly different when asked whether their project teams review past ‘lessons learned’ when making new project plans. Four (4) respondents either disagreed or strongly disagreed that their project teams consulted past ‘lessons learned’ documents/databases during the project planning stage. Three (3) other respondents were neutral to the idea that project teams in their companies consulted their past ‘lessons learned’ documents/databases during the project planning stage. Only 1 respondent agreed that project teams within her/his consulting firm consulted past ‘lessons learned’ documents/databases during the project planning phase. The overall picture from the above analysis is that more project teams in respective firms tend to probably reference more readily or frequently past ‘project plans’ than they do consult past ‘lessons learned’ documents/databases during the project planning phase.

<table>
<thead>
<tr>
<th>No</th>
<th>Project Planning &amp; Execution Stages</th>
<th>1 Strongly disagree</th>
<th>2</th>
<th>3 Neutral</th>
<th>4</th>
<th>5 Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>During planning stage, the review of past project plans is done</td>
<td></td>
<td>3*</td>
<td></td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>ii</td>
<td>During planning stage, the review of past ‘lessons learned’ is done</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>During project execution, data about the actual set of steps used to complete the project is collected</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>A project is usually seen as a learning opportunity</td>
<td></td>
<td>2</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Project teams readily share new ‘lessons learned’ from project success</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>vi</td>
<td>Project teams readily admit and share new ‘lessons learned’ from project failure</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>vii</td>
<td>During project execution, documentation of the set of problems encountered during the project is done</td>
<td></td>
<td>1</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>viii</td>
<td>Some times, project teams encounter the same problem over and over again</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>ix</td>
<td>During the planning stage, the company explicitly include time to do post-project/mortem reviews into the project plan</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>During the planning stage, we explicitly schedule time to do milestone reviews.</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* = Number of respondents who ticked each cell

Table 5: Embeddedness of project learning processes during Project planning & Project Execution
Source: Survey Data

A similar picture emerges when we examine how post-project/mortem reviews are ranked relative to milestone reviews. Six (6) respondents agree or strongly agree that during their project planning stage they explicitly schedule time to do milestone reviews, while only two(2) respondents are neutral to the same statement. On the other hand, only 2 respondents agreed that his/her firm does explicitly include post-project reviews when drafting new project plans. Two other respondents were neutral to the statement, while a total of four (4) either disagreed or strongly disagreed that their respective firms explicitly included post-project/mortem reviews into new project plans. The difference might be due to the different functions played by the two types of reviews. Post-project reviews takes place after a particular project is completed, while milestone reviews take place at various stages during project execution. In some sense, milestone reviews serve as a direct ‘control’ mechanism necessary to the monitoring and completion of a
particular project. Post-project/mortem reviews, on the other hand, serve as a knowledge-

gathering tool, whose utility is related to future or other concurrent projects. In a sense, a post-
project review for a particular project has no direct impact on the ability to deliver that project. 
The relevance of the knowledge gleaned when conducting a post-project review is for the benefit 
of other projects. Consequently, it is likely to be perceived as of high priority when developing a 
project plan for a new project. This result, however, is in contrast to the strong advice from much 
of the project management literature which makes a case for the importance of 
institutionalization of post-project reviews – including their formal inclusion into every project 
plan (Anbari et al., 2008; Koners and Goffin, 2007; Kotnour and Vergopia, 2005; Zedtwitz, 
2002). Despite this some what ‘negative’ outlook, the results shown in Table 6 below seem to 
suggest that almost all the firms represented tend to at least undertake post-project reviews for 
either all or some of their projects. Three (3) respondents indicated that their consulting firms 
undertake post-project reviews on all projects. Four (4) respondents indicated that their 
companies do post-project reviews only on major projects. Only one respondent indicated that 
his/her firm only conduct post-project reviews on projects that had major problems.

<table>
<thead>
<tr>
<th>No</th>
<th>How often do you do Post-Project Reviews (PPR) in your company?</th>
<th>No of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>We do post-project reviews on all projects</td>
<td>3</td>
</tr>
<tr>
<td>ii</td>
<td>We do post-project reviews only on major projects</td>
<td>4</td>
</tr>
<tr>
<td>iii</td>
<td>We do post-project reviews only on projects that had major problems</td>
<td>1</td>
</tr>
<tr>
<td>iv</td>
<td>There is no fixed criteria used to select projects that are subjected to post-project reviews</td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>We don’t do any post-project reviews</td>
<td></td>
</tr>
</tbody>
</table>

Table 6: Frequency of conducting Post-Project Reviews (PPR) 
Source: Survey Data

Getting back to Table 5, we now turn to examining the extent to which project learning processes 
are embedded into ‘project execution’ stage of a project life cycle. Starting with the positive 
aspects first. Table 5 suggests that six (6) of the eight (8) respondents agree or strongly agree that 
their companies see new projects as learning opportunities. The result may be suggesting that, on 
average, most consulting firms might be conscious of the need to continuously upgrade their 
knowledge base and develop project competencies. As indicated earlier, consulting firms are 
considered to be knowledge-intensive, whose project “processes are turned towards the 
exploration, discovery, accumulation, exploitation, and re-selling of societal and individual 
expertise” (Baumard, 2002: 135). Only two respondents were neutral about their respective 
companies’ views. In addition, all the 8 respondents agreed or strongly agreed that project teams 
in their companies readily shared any new ‘lessons’ gleaned from ‘project success’ to the rest of 
the organization. When one looks at the ability to freely share ‘lessons learned’ from project 
failure, however, the picture is slightly different. Only half of the respondents indicated that 
project teams in their organizations would readily admit and share new lessons learned from 
projects that failed. The other four respondents were neutral to the statement. While not entirely 
surprising, atleast four of the respondents seem to suggest that project teams in their respective 
companies find it easier to share new ‘lessons learned’ from successful projects, than they are 
willling to share new ‘lessons learned’ from projects that failed. There are often greater 
opportunities for learning from project failures, than from successful projects (Kasi et al., 2008; 
Newell and Edelman, 2008; Williams, 2003). But for employees to be free to share some of their
failures (& associated derived lessons), the fear of negative sanction must be removed. In other words, the organizational culture needs to have some tolerance for some level of failure – as long as employees learn from them. Related to the difficulties of sharing lessons originating from project failure, is the answer to another statement that asked whether documentation of problems that occurred during project execution where done. Only two (2) respondents agreed or strongly agreed that documentation of the set of problems encountered during the execution of the project were done in their companies. 5 respondents were neutral, while one respondent disagreed with the statement that project teams in his/her company documented all problems encountered during project execution. Further (follow-up) research is required to establish why project team members are less likely to want to document problems that occurred during project execution in some of the firms covered in this study.

Having examined the nature and extent of embeddedness of project learning processes into target firms’ project planning and execution phases, the analysis now turns to examining the characteristics of organizational infrastructure that exist to support interproject learning in firms represented by the 8 respondents. In doing so, we move on to answering the third research question.

5.5. Organizational learning infrastructure (systems, procedures and routines)

For systematic interproject learning to take place in any project-based organization, there must be deliberate systems put in place to facilitate and support learning related activities (Ayas and Zebiuk, 2001; Zedtwitz, 2002). In other words, they should be deliberate investment of resources in terms of physical infrastructure, processes, procedures and routines, personal and cash (Kotnour and Vergopia, 2005; Schindler and Eppler, 2003). Equally important, learning activities must be seen as of strategic importance. Project learning activities must be embedded in every knowledge management processes of any project-based firm (PBF), and be tied to the development of the organization’s long term dynamic project capabilities (Anbari et al., 2008; Newell and Edelman, 2008). In this section, we cover the various facets of organizational infrastructure required to support project learning, as supported by the literature review. Despite separate treatment/discussion of each facet (or statement/row in Table 7), we acknowledge that it is the complementarities and interactivenss of the various facets that actually leads to dynamic project competencies. Like the pieces of a complex puzzle, it is how the different pieces are put together that matters, taking into account the context of each firm.

We start our analysis of the organizational learning infrastructure, by examining responses shown in Table 7. The responses were derived from Q8 in the questionnaire. The question asked respondents to rank the extent to which various learning systems, procedures and routines were implemented in their organizations. Respondents were supposed to rank on a scale 1 to 5. The scale was as follows: 5 = strong implementation, 4 = good, 3 = neither good nor bad, 2 = inadequate implementation, 1 = none exists. The number shown in each cell in Table 7 shows the number of respondents who ticked each box. For example, three respondents indicated that project teams did not explicitly build time for ‘reflective action’ into project schedules. In this statement, we specifically wanted to capture the scheduling of periods of ‘reflection’ before the project is completed. Three other respondents perceived that the explicit inclusion of periods of ‘reflection’ on project outcomes (i.e., during the completion of each milestone/phase) were inadequate in their respective firms, while only one respondent indicated good implementation.
It is important to have periodic times of deliberate ‘reflection’ on project outcomes (Ayas and Zeniuk, 2001; Newell and Edelman, 2008). This helps project team members to dissect what went right and wrong during efforts to complete a particular work package, and how innovative solutions to unfamiliar problems were put together. These lessons, while still fresh in project teams’ minds, can then be documented and stored into the organization’s knowledge repository. Waiting until the project is completed and trying to capture some of such lessons when doing post-project reviews could lead to knowledge loss through lost of memory and/or disappearance/none availability of key project team members.

When we examine the whole of Table 7, we can see only a few patterns. Most of the responses to the statements included in the table tend to result in more or less spread of the ranking of answers given. A few weak trends can be seen, however. For example, 7 out of 8 respondents indicated that their companies had strong or good tradition of forming multi-disciplinary self-managed project teams. Six (6) out of 8 respondents indicated that in their firms, there was good to strong implementation of efforts made to remove organizational/functional boundaries. And five (5) out of 8 respondents thought their organizations had good or strongly implementation of deliberate processes that could capture, document, store, and distribute project experience.

Despite some of the processes installed to support interproject learning, there are also some limitations seen in the responses. For example, 5 out of 8 respondents indicated that the introduction of a ‘no blame culture’ was either none existent or had inadequate implementation.

<table>
<thead>
<tr>
<th>No</th>
<th>Learning systems, procedures and routines in the company</th>
<th>1 None exists</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5 Strong implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Explicitly build time in project schedules for critical ‘reflections’ on project outcome (not just at the end of project)</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Has a Project Management Office</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>iii</td>
<td>We have a ‘no blame culture’ (i.e., tolerant of mistakes)</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Project culture open to experimentation and new insights</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>v</td>
<td>Explicit reward incentives tied to project learning do exists*</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Multi-disciplinary self-managing project teams</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>vii</td>
<td>Removal of organizational/functional boundaries*</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>viii</td>
<td>Have deliberate processes to capture, document, store and distribute project experience</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>ix</td>
<td>Recording of important project events*</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>Groupware/intranet system &amp; discussion forums*</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>xi</td>
<td>Readily accessible ‘Lessons Learned’ database</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>xii</td>
<td>Paper-based reports that describe learning from each project are readily circulated through out the company*</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>xiii</td>
<td>We do post-mortems for all projects undertaken in the company*</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

* Where the total number of respondents in each row was less than 8, which means that one or more respondents did not rank that particular row.

Table 7: Organizational Learning Infrastructure
Source: Survey Data
Only one respondent indicated that his/her company had a good implementation of a ‘no blame culture’, with two respondents neutral to the statement. Yet a ‘no blame culture’ is what is need to ensure project team members are more willing to acknowledge their mistakes, and share what they have learned from their mistakes to the rest of the organization (Kasi et al., 2008). A similar, though slightly better picture emerges when respondents were asked to rank the extent to which a ‘Project culture open to experimentation and new insights’ was implemented in their organization. The responses are more spread this time. There are three respondents who indicate that the implementation of a ‘Project culture open to experimentation and new insights’ is either good or strong. At the same time, however, there are also three respondents who also indicate that the implementation of such a culture was either inadequate or none existent. Two other respondents had a neutral position on the statement. Either way, the result suggests that, at least for the five firms, respective respondents felt that more work was still needed to install a project culture of openness to experimentations.

For the other facets or components of a learning infrastructure, mixed picture emerges among the 8 respondents. There were only two respondents who could categorically say their companies had explicit and good reward incentives that were tied to promoting project learning. Only three respondents indicated that the practice of project teams making ‘records of important project events’ was good. And only one respondent indicated that his/her firm had ‘good’ practices of circulating paper-based reports of new learning taking place in each project, to the rest of the organization. For the later case, five respondents ranked their respective firms’ processes as inadequate or none existent, the practice of circulating paper-based project lessons to the rest of the organization. It is not clear whether the low implementation of such practices was due to low priority given to such knowledge capture and dissemination activities, or was a result of a move towards more electronic based forms of communication.

As shown in Table 6, all respondents indicated that their firms did conduct some form of post-project reviews. Three respondents had suggested that their companies did conduct post-project reviews on all projects. The last row in Table 7 seems to validate that earlier finding, with 3 respondents indicating that their respective companies had good or strong implementation of undertaking post-project reviews on all projects. Of course, the information in Table 6 & 7 does not give us a feel of the quality of the post-project reviews undertaken or the problems encountered when undertaking such reviews. In particular, we have no idea which factors affected the sharing of new knowledge generated during the project execution of one project, to other projects. To get such information, we examine information given in Table 8. The information given in Table 8 was derived from answers given to Q9 in the questionnaire. Respondents were asked to rank the various factors, in terms of their impact as barriers to knowledge sharing across projects. The respondents were asked the extent to which they agreed or disagreed with each statement given in Table 8. They had to rank their answers on a scale of 1 to 5 (5 = strongly agree, 4=agree, 3=neither agree or disagree, 2=disagree, 1=strongly disagree).

With regard to the level of impact, we are interested with items that respondents on average either agreed or strongly agreed. In Table 8, we have at least three items that score above 4 (agree ranking). In other words, the three factors ranked as having a strong effect in hindering knowledge transfer across projects are: (i) High time pressure towards the project’s end (i.e., completion pressure, new tasks awaiting), (ii) Too focused on short-term project deliverables (i.e., meeting immediate milestone), and (iii) Difficulties in coordinating debriefings – persons
already engaged in other new projects. The first factor relates to lack of time for project teams to reflect on their project experiences as they approach the end of the project. There is often a lot of pressure to ‘be done with the project’ – especially if there are serious schedule and cost over-runs. Moreover, some project team members would have already started transiting to their next project. The impetus to get on with the next project can be a big factor in inhibiting knowledge transfer to other projects (Kotnour and Vergopia, 2005). The second factor – too much focus on short term project deliverables – might be relevant at any stage of the project life cycle. In the middle of the typical ‘hecticness’ of any project, focus on learning and knowledge transfer issues when there are tight deadlines to meet, might not be too attractive a way to spend one scarce resource on project work – time. The third factor, difficulties in coordinating debriefing meetings – has already discussed earlier. As each project begins to wind-down, most project resources (especially project team members) begin to migrate to other projects either in the same company or to other firms. When the time to do debriefing meetings arrives, most of the project team members would have long dispersed.

### Table 8: Factors that hinder knowledge transfer across projects

<table>
<thead>
<tr>
<th>No</th>
<th>Difficulties of sharing new knowledge across projects</th>
<th>Average ranking*</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Project team members don’t see any benefits in getting involved in post-project reviews</td>
<td>2.50</td>
</tr>
<tr>
<td>ii</td>
<td>It is not mandatory to use ‘lessons learned’ of past projects when starting a new project</td>
<td>2.75</td>
</tr>
<tr>
<td>iii</td>
<td>Difficulties in coordinating debriefings – persons already engaged in other new projects</td>
<td>4.13 (3)</td>
</tr>
<tr>
<td>iv</td>
<td>Experience ‘reflection’ &amp; recording not integrated into project management processes</td>
<td>2.75</td>
</tr>
<tr>
<td>v</td>
<td>High time pressure towards the project’s end (i.e., completion pressure, new tasks awaiting)</td>
<td>4.50 (1)**</td>
</tr>
<tr>
<td>vi</td>
<td>Fear of negative sanctions (in case of disclosing mistakes)</td>
<td>2.50</td>
</tr>
<tr>
<td>vii</td>
<td>Having only project reviews at the end of the project</td>
<td>2.38</td>
</tr>
<tr>
<td>viii</td>
<td>Don’t have an organizational learning culture</td>
<td>2.88</td>
</tr>
<tr>
<td>ix</td>
<td>Lack of incentives explicitly tied to project learning</td>
<td>2.88</td>
</tr>
<tr>
<td>x</td>
<td>Too focused on short-term project deliverables (i.e., meeting immediate milestone)</td>
<td>4.38 (2)</td>
</tr>
<tr>
<td>xi</td>
<td>Others, please specify:</td>
<td></td>
</tr>
</tbody>
</table>

* \( \text{Average ranking} = \frac{\text{Sum of total rankings in a particular cell}}{\text{Number of respondents who ranked the item}} \)

** \( \text{Number in brackets show order of ranking} \)

When we examine the lower end of the ranking scale, we get one surprising finding. A couple of research findings have found that one factor which hinders the transfer of knowledge across projects is the perceptions by project team members of the utility of being involved in post-project reviews (Kasvi et al., 2003; Newell and Edelman, 2008; Zedtwitz, 2002). Such studies found that some project team members did not see any value in taking part in post-project reviews, since such reviews did not add value to the current project. Surprising, our respondents do not seem to highly rank this problem. Care must be exercised in interpreting our results. It is likely that the difference in the finding is a result of the differences in the type of respondents asked in various studies. Our study asks opinions of project practitioners who are in management-related positions. These respondents might be inclined to ‘shine’ positive light on their project reviews processes, than if a similar question was asked to other project team members without management responsibilities in respective companies. Hence, the importance of soliciting views from different respondents with different roles in project teams.
Chapter 6: DISCUSSION OF RESULTS

6.1. Introduction

This chapter discusses the results from the Data Analysis section, in the light of findings from literature on project-based firms. In areas where our findings are similar to past research results, we highlight those researchers’ findings. Where they are differences, we outline some of the possible reasons why our results might differ? The discussion follows the same sequence given in Chapter 6. We start by discussing the data analysis results to the first research question, before moving to answers to the second research question, and so forth.

6.2. The relative importance of different Interproject learning mechanisms

A study by Prencipe and Tell (2001) list an extensive (though not necessarily exhaustive) list of interproject learning mechanisms at different levels of the organization (i.e., individual-, group/project- and organizational-levels). Building on that list and other past research, the authors of this research were able to aggregate and reduce the number of items into a manageable list. The responses on the administered questionnaires suggest that most respondents rank highly (in importance) those interproject learning mechanisms that involve face-to-face transmission of new project knowledge across project teams or to the rest of the parent organization. New project knowledge (i.e., new innovative solution to a first-time encountered problem) is often dynamic, evolving, and situation specific to a particular project setting or group (Bresnen et al., 2003). Its development might involve a combination or re-combination of new and existing knowledge bases, as well as, trial and error experimentation. In such situations, the new knowledge would have a high degree of tacitness (or stickiness). In such cases, a more effective and efficient transfer mode of knowledge transfer would require person-to-person interactions. Among the surveyed consulting firms, assigning experienced consultants to new projects is ranked as the most important way of transferring new project knowledge across projects. This is followed by the ‘person-to-person informal discussions with work colleagues involved in other projects’.

Moving experienced organizational members to new projects is seen as a very effective tool to transfer knowledge across the organization (Argote and Ingram, 2000). Experienced team members are able to adapt the tacit and explicit knowledge they have to new situations (in a way that knowledge carried in explicit format alone can not). The transfer of knowledge through assigning experienced personal to new projects also allows flexibility in delivery of new knowledge. There is opportunity for discussions, clarifications, and sharing of interpretation of ‘meaning’ with other project team members (Boh, 2007; Prencipe and Tell, 2001). This process of building organizational-wide project competencies through the moving around of experienced project team members has been termed ‘Experience accumulation’ (Zollo and Winter, 2002). Newell and Edelman (2008) argues for a more strategic approach to assigning experienced project team members to new projects, as a means to enhance effective and efficient problem-solving:

“Strategically utilizing accumulated experience, so that people are assigned to projects where their previous experience is going to be applicable, would mean that there may be more efficient team learning on a project, because the individuals involved have been assigned based on the fact that they have learnt how to solve the problems that are likely to be faced” (Newell and Edelman, 2008: 570).
From the limited results we have, it seems that knowledge capture, transfer and sharing through ‘experience accumulation’ is highly regarded in almost all the respective consulting firms in our survey. Our result is similar to other research findings. A couple of past researches argue for the need to institutionalize the process of transferring experience staff to new projects, as a means to enhance knowledge transfer (Argote and Ingram, 2000; Newell et al., 2006; Zedtwitz, 2002).

For the second important interproject learning mechanisms – learning new knowledge through dialogue with other work colleagues – a study by Bresnen et al. (2003: 165) found that knowledge acquisition and transfer in project settings rely heavily on “social patterns, practices and processes in ways which emphasis the value and importance of adopting a community-based approach”. A study by Marks and Lockyer (2004) of design project teams in five software firms in Scotland found a very strong reliance on other project team members and project work as a means to acquire new knowledge and skills. “Team members were cited as being the most important resource for the acquisition of knowledge” (ibid: 239). Over time, team members broadened their knowledge by working and moving across different projects, while learning from more experienced colleagues and acquiring a diverse portfolio of project experiences. Project design teams tend to be more multi-disciplinary, requiring diversity of knowledge bases. The skills interdependence required to jointly analyze and solve complex design problems often meant that knowledge flow and learning were often done informally among project team members (ibid).

Our finding tends to support the results of Koch (2004). Koch’s study on knowledge production processes in a Danish Consulting Engineering firm found that;

“The single project gives rise to negotiations on necessary knowledge, potential reuse of knowledge and how to create knowledge. ….. problem-solving most frequently occurs through directly conferring with colleagues who have solved a similar problems before. This again is predominantly done on the basis of direct interpersonal interaction” (ibid: 294).

The limited studies of learning in consulting firms in India (Lam, 2005) and the US (Boh, 2007) found a preference for person-to-person mode of communication. Similarly, a study by Werr and Stjernberg (2003: 893) on two global management consulting organizations (Accenture and Ernst & Young Management Consulting) reports that the “consultants in our study repeatedly referred to their own and their colleagues’ experience as the most important source of knowledge in designing and carrying out consulting projects”. The importance of face-to-face interaction as a ‘rich’ form of knowledge transfer suggest that significant amount of project knowledge in consultancy firms in our survey remains uncodified or uncodifiable. Such knowledge is ingrained in individual experienced/expert consultants embedded within project teams and within their associated knowledge networks. In a study done by Bresnen et al., (2003: 161), a quote is given of one response from the Technical Director, who said: “In these days of electronic wizardly and technology, my opinion is that you can’t beat a face-to-face, eyeball-to-eyeball meeting”.

Though face-to-face interaction-based interproject learning mechanisms are highly ranked, it is important to note that they suffer from what has been called the “problem of scalability” (Boh, 2007: 32). In other words, the knowledge ‘expert/possessor’ can only be at limited places at any
one time. In addition, the following has to take place before new knowledge is transferred: (i) the knowledge recipient must realize the need of new knowledge, and be willing to put efforts in seeking to fill the missing knowledge gap; (ii) the knowledge recipient must know who in the organization possesses the missing knowledge gap; and (iii) the knowledge holder/possessor must be willing to share his/her knowledge (Watson and Hewett, 2006). All the three factors can act as barriers to knowledge sharing within an organization. For example, the ‘knowledge recipient’ might not want to admit he lacks certain knowledge, as it represents admission of ignorance (Lam, 2005). Or if he wants to search for new knowledge, he might not know who has the appropriate knowledge in the organization. Even with the existence of expert directories in the organization’s database, it might take some effort to get the right person. And more importantly, the ‘knowledge holder’ might not be willing to share the information or knowledge being sought, if knowledge sharing means a loss of competitive advantage. A study by Lam (2005) on knowledge management in one Indian consulting firm found that the intensive competitive culture among the various company consultants resulted in ‘knowledge hoarding’. To overcome such disincentives, organizations might want to introduce incentives that are directly related to knowledge sharing. For example, project managers and project team members could be periodically appraised, in part, on how much effort they exerted disseminating new knowledge across their organization.

Most interproject learning mechanisms that are perceived as supporting the creation, capture and dissemination of ‘explicit’ project knowledge seem to be ranked as of moderate to low importance. Codified learning mechanisms are often not seen as providing a “rich medium for communication” (Boh, 2007: 30). For example, the use of ‘lessons learned’ databases was ranked 6\textsuperscript{th} in importance, post-project reviews ranked 8\textsuperscript{th} in importance, and ‘Groupware/intranet & Forum’ was ranked 10\textsuperscript{th} in position. The low ranking of the latter group of learning mechanisms was rather surprising, taking into account the widespread use of information and communication technology (ICT) in today’s consulting firms. One probable reason might be that most respondents saw Groupware/intranet & forums more as channels to distribute information, but not necessarily a medium for communicating knowledge.

The low ranking of the use of ‘lessons learned’ databases and post-project reviews as a means to enhance interproject learning might be due to a number of factors. Firstly, most studies that have been done on both mechanisms find a generally low (consistent) application of these two interproject learning mechanisms in other sectors - other than consulting sector (i.e., Kasvi et al., 2003; Koners and Goffin, 2007; Schindler and Eppler, 2003). A study of one of the two engineering project-based firms covered by Prencipe and Tell (2001: 1384) shows that even if project reviews were done throughout all the projects, “they were aimed 95% at reviewing costs and schedules, and only 5% at lessons learnt”. Studying post-project reviews in R&D projects, Zedtwitz (2002) analyses 63 responses from a group of senior R&D managers and R&D directors. The results show that only 8 out of the 63 respondents (13%) thought results from post-project reviews were used to improve the effectiveness and efficiency of project management processes.

The mechanics of how to conduct ‘good’ post-project reviews have been covered elsewhere in the literature (i.e., Anbari et al., 2008; Kotnour and Vergopou, 2005; Lee, 2008), and will not be covered here. What can be mentioned here, is the importance of institutionalizing the structures, processes, procedures, routines and incentives that systematically support the capture, store and
dissemination of new project knowledge and experiences for future re-use (Ayas and Zeniuk, 2001; Schindler and Eppler, 2003). For example, Watson and Hewett (2006) argues that two factors need to be considered when trying to promote project knowledge transfer using ‘lessons learned’ stored in knowledge repositories like databases. Firstly, useful knowledge to future project teams must be stored. This includes what learning and knowledge is stored, how it is stored, and where. Secondly, the actual demand to use new knowledge stored in databases by future project teams. This includes perceptions of what relevant knowledge is stored in databases, easy of access, and incentives project teams have to invest in consulting project documents on past projects.

Having discussed the broad characteristics of interproject learning used by firms, we now turn to the perceived impact on the development of Project competencies.

6.3. Types of Project Competencies developed

Due to a small response rate, the survey results suggest limited patterns that should be interpreted with caution. The results suggest that respondents thought most of the interproject learning taking place in their consulting firms were geared towards strengthening the capacities to improve what can be loosely called ‘traditional’ project parameters. In other words, interproject learning strengthened project teams’ capacities to: (i) make better estimates of project costs, (ii) make better estimates of schedule, (iii) have a better understanding of the right ‘methods’ to follow to ensure project success, and (iv) adjust team dynamics to unforeseen contingencies. Our results seem to be in line with findings from Newell et al. (2006). Newell et al. (2006) makes distinctions between two types of learning and knowledge; product knowledge and process knowledge. They define product knowledge as learning and knowledge that is associated with the goals or objectives of the project (i.e., deliverable or output). Process knowledge was defined as “knowledge about processes that the team had deployed to achieve these goals and why they seemed to have worked well or badly” (ibid: 175). In their study of 13 projects in 6 firms, they find that most learning was related to ‘product knowledge’ rather than to ‘process knowledge’. In this study, the four above types of competencies ranked to have been well developed are those that are related to the immediate deliverable or project output. More importantly, most of the well developed project competencies cited above may be by-products associated with the practice of assigning more experienced project consultants to new projects.

Project competencies that can be characterized as underpinned by ‘process knowledge’ are less developed. These include cases where interproject learning had little effect in developing; (i) the abilities of project teams to have a better understanding of what could go wrong at project-start (needed to develop advance-contingence plans), (ii) ability to transfer new knowledge quickly to other projects (or learning to learn), (iii) ability to improve cost efficiencies (which is different to ability to make better cost estimates), and (iv) ability to make better estimates of project risks. It is possible that these deficiencies may explain why only one respondent strongly agreed that interproject learning enhanced the ability of project teams to meet project objectives (i.e., cost, schedule and performance requirements), and only three respondents agreed or strongly agreed that interproject learning had strengthened the abilities of their respective companies to satisfy their customers.
6.4. Status of different components of Organizational-wide infrastructure supporting interproject learning

In our study, most respondents agreed that multi-disciplinary team that cut across functional boundary existed in their firms. This is in line with other empirical studies (Ayas, 1997; Prencipe and Tell, 2001; Williams, 2004). From our findings, most respondents thought their organizations had good or strongly implemented deliberate project learning processes. This trend is supported by other studies. Carrillo et al. (2003) indicated that 40% of the respondents in project-based firms in the UK had already in place a knowledge management strategy, and another 41% had planned to have it in the near future. Prencipe and Tell (2001), Knoers and Goffin (2007), and Newell and Edelman (2008) all find similar results with their case studies on project-based firms, showing that most companies covered had procedures in place to capture, store and distribute the lessons learned from projects. Even with the implementation of deliberate inter-project learning processes, metaphors and stories were often not documented so well, such that the dissemination of learning was actually limited in some of the companies studied (Newell and Edelman, 2008). Newell and Edelman (2008) also indicated that the case study project team members did not consider database as helpful, because they did not really read them, and believed that the uniqueness of each project makes it less helpful as a basis of learn for future work on other projects. These findings are also consistent with the study done by Zedwitz (2002). Moreover, Williams (2003) indicated that in practice, most individual firms do not have project review processes to capture, store and disseminate lessons learnt. In addition, he also found out that post-mortems were not implemented frequently in practice. In his follow-up study in 2006, he indicated that only 12% of respondents confirmed that procedures on how to do post project reviews were followed (Williams, 2003), which has a similar trend to our findings that 3 of 7 respondents think the post-mortems are implemented or strongly implemented in their firms.

Irani and Love (2000) emphasized that learning should be shared across the organization, so that failures could be avoided and the successes could be replicated. However, Prencipe and Tell (2001) conducted an exploratory study on project-based firms, finding that project teams in two firms that had ‘lessons learned’ databases did not share the knowledge stored in the databases and paper-based minutes to the rest of the company. Project team members only shared information within each project team. Their results are similar to our finding to a certain extent. Our results suggest that 5 of the 7 respondents indicated that their respective firms had either poor implementation or non-existent organizational systems, procedures, and routines that facilitated the circulating of ‘paper-based reports’ on interproject learning to the rest of the organization.

High-time pressures, focus on short-term project deliverables and problems associated with getting project team members to attend debriefing meetings were rated as three most important factors in inhibiting the transfer of new project knowledge to other current & future projects. While these findings are largely in line with past research findings (i.e., Schindler & Eppler, 2003), we also find that most respondents didn’t think their project team members ‘undervalued’ the importance of post-project reviews (PPRs) – which contradicts some findings from past research. As indicated earlier, the difference might be driven by our use of different types of respondents in our study. It is possible that the perceptions of the utility of PPRs might be different between ‘ordinary’ project team members visa-a-visa management level personal. This generates the need to survey both of the two groups’ perceptions in any future research.
Chapter 7: CONCLUSIONS AND RECOMMENDATIONS

7.1. Introduction

This chapter summarizes the broad conclusions drawn from this research. The research study was done in the context of growing debate on the need to extend our understanding of how knowledge is managed in project-based firms. There are specific problems related to project work that makes the management of knowledge in project work environment especially challenging. Observed discontinuity in resources-flow (i.e., project team members, input materials, work-flow, etc) presents daunting challenges in continuously accumulating new knowledge and upgrading project competencies (Bresnen et al., 2003). Apart from wanting to expand our knowledge of interproject learning mechanisms and project competencies in the consultancy sector, this research was inspired by the study conducted by Prencipe and Tell (2001), who argue for more research on interproject learning in different contextual environments (or sectors). This concluding chapter begins by examining the similarities and differences between the literature review and our empirical findings.

7.2. Literature review versus Empirical findings

The comparisons between the literature review and empirical findings is analyzed by following the research questions we sort to answer in this study.

(i) *What are the different types of interproject learning mechanisms used by consultancy firms to transfer lessons learned on one project to other project(s) or the parent organization? And what are their perceived ranking in importance?*

The general thrust of past research findings conducted in other sectors (notably from manufacturing, engineering and construction sectors) were supported by our findings from the 8 respondents drawn from consulting firms in Sweden. Most respondents ranked highly the importance of those interproject learning mechanisms that involved face-to-face interaction and knowledge sharing (i.e., transferring experienced staff to new projects, and informal individual-to-individual discussions, conversations and dialogues). These types of interproject learning mechanisms tend to be 'rich' medium for the transmission of tacit or near tacit knowledge. There are also advantages of flexibility and adaptability of knowledge to new contexts (i.e., knowledge recipients can ask for instant clarification on something they don’t understand).

The result do not, however, negates the importance of mechanisms that support the transmission and diffusion of explicit knowledge (i.e, through ICT-supported medium), or the need to have deliberate processes that can convert tacit knowledge to explicit knowledge for easy transfer. The main argument is that both types of knowledge are important for successful execution of projects in the consultancy sector. In the current digital era where early literature in the field of organizational knowledge management, tended to over emphasise the power of computer technology in transferring knowledge, our finding is an overdue correction. Electronic and computer-based technologies can only facilitate the fast transfer of large quantities of codified or codifiable knowledge. It is poorly positioned to transmit uncodifiable tacit knowledge (Boh, 2007).
(ii) Which types of project competencies are perceived – by project management practitioners - as well developed due to investment in interproject learning in consultancy firms?

In broad terms, most respondents tend to think that interproject learning processes taking place in their respective firms is geared towards building project competencies that are associated with ‘product knowledge’ rather than ‘process knowledge’. In other words, interproject learning in the respective firms has greater emphasis on short-term abilities (i.e., capacities to make better estimates of project costs, schedules, and chose right project methodology) to meet a particular project output or deliverables. Interproject learning happening in respective firms is not always geared towards continuous ‘process improvements’ – better estimate of project risks, faster transfer of new ‘sticky’ project knowledge to other parts of the organization, and better advance-understanding (at the start of the project) of what could go wrong with a project. Efforts on upgrading ‘process knowledge’ through interproject learning is at least not as much as that put to meeting short term project objectives. Yet, the latter competencies are important in developing dynamic project competencies and long-term competitiveness. While our findings are similar to Newell et al. (2006), most past research on learning in projects haven’t caught-up with the distinction between ‘product knowledge’ versus ‘process knowledge’.

(iii) Which learning infrastructure, systems, procedures, and routines have been built-up to support and promote organizational-wide interproject learning? To what extent are different components of learning-supporting infrastructure perceived to be very well developed?

This question had the most mixed picture, in part due to the small number of respondents. Most respondents indicated that their firms had good or strong practices related to employing multi-disciplinary self-managing project teams, removal of organizational/functional boundaries, and having deliberate processes to capture, document, store and distribute project competencies. However, some of the basic learning-supporting infrastructure necessary to support learning were not well developed (i.e., explicit scheduling of time to do ‘reflections’ during project execution, emerging of a ‘no blame’ culture, instilling a culture of experimentations, and emphasizing the importance of rapid and regular circulation of paper-based reports that described new learning being generated from ongoing project activities). There are probable reasons from the literature why most firms may underperform on some of these learning enhancing processes. But these areas also provide greater opportunities for future improvements.

7.3. Recommendations

From the above discussions, a number of recommendations can be made. It is important, however, to note that firms represented in our sample have different starting base. So, care has to be made when making any recommendations. Different firms would have different levels of ‘maturity’ with regards to interproject learning mechanisms and project competences.

The following recommendations can be made:

(i). Consulting firms should focus on the development of interproject learning mechanisms that emphasize the creation, capture, storage, dissemination, and reuse of both tacit and explicit knowledge. What is required is an optimum and appropriate portfolio of project
learning mechanisms tailored to the dynamic needs and circumstances of each firm. There is no ‘best fit all’ solution.

(ii). In addition to focusing on project competencies associated with ‘product knowledge’, consulting firms should invest more resources in developing project competencies that are associated with long term dynamic competitiveness (i.e., invest more in ‘process knowledge’ – key to continuous improvement of managing project processes).

(iii). While no one company can be good at everything, some of the firms analyzed here might want to prioritize strengthening some components of their learning infrastructure that are lagging behind (i.e., explicit scheduling of time to do ‘reflections’ during project execution, emerging of a ‘no blame’ culture, instilling a culture of experimentations).

7.4. Limitations of the study

This study has several limitations, some of which are:

(i). Due to the fact that we could not get access to one or two consultancy firms to enable us to do some interviews, we could not do any meaning triangulation of feedback from respondents. Future follow-up studies might want to allocate enough time and resources to ensure proper triangulation is done.

(ii). The research study only focused on ‘perceptions’ of key informed ‘project management practitioners’ with some managerial experience. It might be helpful in future studies to capture the perceptions of other project team members who have no managerial experiences.

(iii). This research was a cross-sectional study. A longitudinal study would capture the dynamics involved in developing interproject learning mechanisms and project competencies. This limitation is, somehow mitigated by the fact that our study captured the perceptions of project management practitioners who had a reasonable number of years in running projects.

(iv). Our study was exploratory, focusing on a relatively small number of respondents. It might be helpful to do future research which involves a large numbers of respondents in the consultancy sector. With a high enough response rate, it might be possible to undertake statistical analysis of the returned data.

7.5. Possible future research directions

All the above mentioned limitations of the study provide opportunities for future research direction. In addition, it might be helpful to focus on generating more refined measures to capture the extent of interproject learning and project competencies. Our study focused on ‘perceptions’ rather than what can be called ‘hard’ indicators.
7.6. Viability and Reliability of the research

The rigour of any research undertaken is very important. It determines the truthfulness and authenticity of research findings. The quality of most research is often determined by examining the validity and reliability of the research findings. However, the way validity and reliability are measured remains contentious, and is often seen to be different for studies located in two different research philosophies; positivistic versus phenomenological epistemological traditions (Creswell & Miller, 2000; Sale, Lohfeld and Brazil, 2002). As an exploratory-qualitative study, our research tilts towards the phenomenological epistemological research tradition. How validity or reliability is achieved in this type of research is slightly different to positivistic research tradition (Golafshani, 2003).

As a springboard to discussing how validity and reliability is measured in qualitative research, we begin our analysis by introducing the traditional meaning of the two terms. In positivistic studies, validity captures the extent to which an instrument measures what it is intended to measure - the targeted concept (Lucy, 2005; Golafshani, 2003). There are often five types of validity tests; construct validity, face validity, content validity, congruent validity, and predictive validity (ibid). With regards to qualitative research, however, there is often a perception that validity has to be operationalized differently (Mays & Pope, 2000). “‘Validity’ to a quantitative researcher would mean that results correspond to how things really are out there in the world, whereas to a qualitative researcher ‘valid’ is a label applied to an interpretation or description with which one agrees” (Smith and Heshusius, 1986, as cited in Sale et al., 2002: 45). Consequently, many qualitative researchers prescribe different methodologies of establishing validity for qualitative research.

According to Bryman and Bell (2007), validity in social sciences means to what degree one’s argument could be proved true in social settings. Specifically, internal validity is concerned about the questions such as; “Do the findings of the study make sense?, Are they credible to the people we study and to our readers?, Do we have an authentic portrait of what we were looking at?” (Miles and Huberman, 1994: 278). External validity focuses on whether we can generalize the result of the study beyond the specific context where it is generated (Bryman and Bell, 2007).

In qualitative research, a number of methods have been suggested of ensuring validity of research findings. Some of the methods include; triangulation, respondent validation, a clear account of method(s) used in data collection and data analysis, reflexivity, and attention to explanations of contradictory findings (Mays and Pope, 2000). Stenbacka (2001) argues that qualitative research is valid:

“…if the informant is part of the problem area and if he/she is given the opportunity to speak freely according to his/her own knowledge structures. Validity is therefore achieved when using the method of non-forcing interviews with strategically well-chosen informants” (p552).

From the above definition, we can argue that our research is valid due to the fact that our questionnaire targeted the perceptions of well-informed project management practitioners. In our exploratory study, and considering the research objective and the resources limitations, we initially had planned to collect data using two methods; interviews to at least two consulting firms, combined by a survey questionnaire being sent to over 40 consulting companies in
Sweden. Combining the two methods could have enabled us to do some triangulation of our research findings, thereby increase internal validity (Paulien, et.al, 2002). However, we could not get a consulting firm that was willing to provide access to their operations. One of the reasons cited by some companies for refusal to provide access included that of key personnel being very busy.

In the end, we only administered a mostly close-ended questionnaire. The main objective was to ensure internal validity for our study. In terms of external validity, as an exploratory study, we are not too focused on generalization. We are mainly focusing on understanding the salient factors that influence interproject learning mechanisms and project competencies in consulting firms in Sweden. However, by eliciting ‘expert’ opinions from project management practitioners who have some degree of management experience, we hope to capture the perceptions from management’s point of view. Our findings of salient factors could form a base for more ambitious future researches that would include larger samples and quantitative variables.

Reliability has been defined by Bryman and Bell (2007) as the degree where a measure of the concept is stable, which is essential a pre-condition for validity. Long & Johnson (2000: 30) quotes Hammersley (1992: 67), defines reliability as referring “to the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions”. However, most social phenomenon studied in social sciences are often dynamic and situation-specific, leading some researchers to argue that traditional definition of reliability has no meaning in qualitative research (Stenbacka, 2001). Other researchers have, instead tried to develop other terminologies they feel are better descriptor of ‘reliability’ of qualitative research findings. For example, terms like Credibility, Confirmability, Dependability, Transferability, etc., have been used instead of Reliability (Golafshani, 2003). It is often argued that dependability of research results is enhanced through “auditing of the decision trial” (Long and Johnson, 2000: 31). However, Long and Johnson (2000) goes on to say: “Rather than attempting to hid behind a smokescreen of synonyms, perhaps interpretive researchers ought simply to accept that reliability is unlikely to be a demonstrable strength of their work” (p31).

From the above discussion, we can argue that our research does have some degree of reliability, as we give a detailed account of how the research was approached and designed (Chapter 4). A trail of different decisions made and why they were made are outlined in Chapter 4.

Following Mays & Pope’s (2000) prescription, we can make a case of the relevance of our research study based on two criterion; (i) that some of our research findings from the Consulting sector tended to increase the confidence of findings from research on interproject learning done in other sectors, and (ii) similar findings might be possible from future studies if the same ‘mostly’ closed questionnaire was administered to similar respondents in similar companies.
References


References:


Mainga, W., Rwelamila, P. and Carden, J. (n/a) Strategic management of interproject learning at one South African graduate business school, unpublished research paper.


Tell, F. (1997) Knowledge and justification exploring the knowledge-based firm, Dissertations from IMIE. Linkoping University, Sweden.


Appendix 1: Covering Letter for the Questionnaire

Ms Lina Yan  
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Umea 90734 
Sweden  
Email: liya0001@student.umu.se  
wima0002@student.umu.se

24th November 2008

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: REQUEST TO FILL-IN A QUESTIONNAIRE ON INTERPROJECT LEARNING

Reference is made to the above subject.

We are postgraduate students doing a Masters in Strategic Project Management at Umea University, Sweden. We are currently doing a dissertation on Inter-project learning mechanisms in project-based firms: Consultancy firms in Sweden.

We are writing to request if you could kindly fill-in the attached 3-page questionnaire. We estimate it should take not more than 10-15 minutes to fill-in the questionnaire. The Questionnaire focuses on ‘inter-project learning’ (the process of transferring ‘lessons learned’ on one project to other concurrent or future projects). The aim of the research is to examine project-based firms’ experiences with their execution of projects, and how managers in such firms think inter-project learning mechanisms can improve their project competencies.

Please kindly download the attached questionnaire onto your computer’s c-drive or ‘My Document’ folder, fill it in, save it, and then re-attach it to any of the two return email addresses given below:

E-mail address: liya0001@student.umu.se or wima0002@student.umu.se

We would like to express - in advance - how very grateful we are for your understanding help in filling-in the questionnaire. All information provided will be treated with strictest confidence, for academic purposes only, and no identity of any respondent will be revealed in the MSc dissertation report.

We look forward to receiving your response.

Yours sincerely,

Lina Yan & Wise Mainga.
Appendix 2: Survey Questionnaire

INTER-PROJECT LEARNING QUESTIONNAIRE

Instructions:

1. The Questionnaire focuses on ‘inter-project learning’ (the process of transferring ‘lessons learned’ from one project to other concurrent or future projects).
2. Please kindly answer all or as many questions as possible.
3. Please download the questionnaire onto your computer’s c-drive or ‘My Document’ folder, fill it in, save it, and then re-attach it to any of the two return email addresses given below:

   Postal Address: Ms Lina Yan, Historiegrand 08 C 0233, Umeå University, Umeå 90734, Sweden
   E-mail address: liya0001@student.umu.se or wima0002@student.umu.se

Section A: General Questions

Q1. How many years have you been working on projects? _____________ years
Q2. What is the typical role you play in projects? (i.e., Project coordinator, Project Manager, etc)  __________________________
Q3. What is the name of your company or sector? (optional)  ______________________________________

Section B: Inter-project Learning Mechanisms

Q4. Which mechanisms listed below does your company use to transfer ‘lessons learned’ on one project to other projects or parent organization? (please rank the most applicable in order of importance, i.e., 1, 2, 3, 4, etc.).

<table>
<thead>
<tr>
<th>No</th>
<th>Mechanisms of transferring ‘lessons learned’ on one project to other projects</th>
<th>Select and rank those applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Project documents (i.e., project manuals, status reports, process maps, surveys, etc)</td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>De-briefing meetings</td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Person-to-person informal discussion with work colleagues involved in other projects</td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Cross-staffing of experienced project team member(s) to a new project</td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Use of ‘Lessons learned’ database</td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>On-going project review meetings (i.e., milestone/stage-gate reviews, review workshops, project team meetings, etc)</td>
<td></td>
</tr>
<tr>
<td>vii</td>
<td>Recruitment of external expertise to be part of project team</td>
<td></td>
</tr>
<tr>
<td>viii</td>
<td>Ad-hoc meetings</td>
<td></td>
</tr>
<tr>
<td>ix</td>
<td>Post-project reviews (i.e., Case writing, use of external auditors, project history files, etc)</td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>Informal organizational routines (i.e., project team/managers’ camp outings, central meeting place, storytelling sessions, etc)</td>
<td></td>
</tr>
<tr>
<td>xi</td>
<td>Groupware/intranet &amp; Forum (i.e., micro articles by email, request for information, etc)</td>
<td></td>
</tr>
<tr>
<td>xii</td>
<td>Others, please specify:</td>
<td></td>
</tr>
</tbody>
</table>
Q5. How often do you do Post-Project Reviews (PPR) in your company? (please put an ‘X’ in the appropriate box selected)

<table>
<thead>
<tr>
<th>No</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>We do post-project reviews on all projects</td>
</tr>
<tr>
<td>ii</td>
<td>We do post-project reviews only on major projects</td>
</tr>
<tr>
<td>iii</td>
<td>We do post-project reviews only on projects that had major problems</td>
</tr>
<tr>
<td>iv</td>
<td>There is no fixed criteria used to select projects that are subjected to post-project reviews</td>
</tr>
<tr>
<td>v</td>
<td>We don’t do any post-project reviews</td>
</tr>
</tbody>
</table>

Q6. Which activities shown in the table below describe more accurately the project planning and execution stages in your company? (please say whether you agree or disagree with statements given below, using the following scale: 5 = strongly agree, 4=agree, 3=neutral, 2=disagree, 1=strongly disagree). Please put an ‘X’ in the appropriate box selected.

<table>
<thead>
<tr>
<th>No</th>
<th>Project Planning &amp; Execution Stages</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>During planning stage, the review of past project plans is done</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>During planning stage, the review of past ‘lessons learned’ is done</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>During project execution, data about the actual set of steps used to complete the project is collected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>iv</td>
<td>A project is usually seen as a learning opportunity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Project teams readily share new ‘lessons learned’ from project success</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Project teams readily admit and share new ‘lessons learned’ from project failure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vii</td>
<td>During project execution, documentation of the set of problems encountered during the project is done</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>viii</td>
<td>Some times, project teams encounter the same problem over and over again</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ix</td>
<td>During the planning stage, the company explicitly include time to do post-project/mortem reviews into the project plan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>During the planning stage, we explicitly schedule time to do milestone reviews.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Section C: Project Competencies

Q7. Which project competencies shown below have been enhanced as a result of transferring ‘lessons learned’ across projects? (please say whether you agree or disagree with statements given below, using the following scale: 5= strongly agree, 4=agree, 3=neither agree or disagree, 2=disagree, 1=strongly disagree). Please put an ‘X’ in the appropriate box selected.

<table>
<thead>
<tr>
<th>No</th>
<th>Inter-project learning has enhanced the following Project Competencies:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Ability to assess complex and fluid situations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii</td>
<td>Better estimates of project costs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii</td>
<td>Better estimates of schedules</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iv</td>
<td>Better estimates of project risks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>v</td>
<td>Ability to adapt project structure to new work processes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vi</td>
<td>Improved cost efficiencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>vii</td>
<td>Abilities to meet project objectives (i.e., cost, schedule and performance requirements)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>viii</td>
<td>At project start, project teams have a better understanding of what could go wrong</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ix</td>
<td>When starting a new project, project teams have a better understanding of the right work methods to follow to ensure project success</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x</td>
<td>Ability to adjust team dynamics to unforeseen contingencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>xi</td>
<td>Transferring of new knowledge quickly to other projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>xii</td>
<td>Ability to satisfy our customer(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section D: Learning Infrastructure & Post-mortem Reviews

Q8. Please rank the extent to which the various systems, procedures and routines have been implemented in your company? (please say whether none or full implementation exist, using the following scale: 5=strong implementation, 4=good, 3=neither good or bad, 2= inadequate implementation, 1= none exists). Please put an ‘X’ in the appropriate box selected.

<table>
<thead>
<tr>
<th>No</th>
<th>Learning systems, procedures and routines in the company</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Explicitly build time in project schedules for critical ‘reflections’ on project outcome (not just at the end of project)</td>
<td></td>
<td></td>
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<td>ii</td>
<td>Has a Project Management Office</td>
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<td>iii</td>
<td>We have a ‘no blame culture’ (i.e., tolerant of mistakes)</td>
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<td>iv</td>
<td>Project culture open to experimentation and new insights</td>
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<td>v</td>
<td>Explicit reward incentives tied to project learning do exists</td>
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<td>vi</td>
<td>Multi-disciplinary self-managing project teams</td>
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<tr>
<td>vii</td>
<td>Removal of organizational/functional boundaries</td>
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<td>viii</td>
<td>Have deliberate processes to capture, document, store and distribute project experience</td>
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<td>ix</td>
<td>Recording of important project events</td>
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<td>x</td>
<td>Groupware/intranet system &amp; discussion forums</td>
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<td>xi</td>
<td>Readily accessible ‘Lessons Learned’ database</td>
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<td>xii</td>
<td>Paper-based reports that describe learning from each project are readily circulated through out the company</td>
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<td>xiii</td>
<td>We do post-mortems for all projects undertaken in the company</td>
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</tbody>
</table>
Q9. Which factors do you think hinder the transfer of knowledge across projects in your company? (please say whether you agree or disagree with statements given below, using the following scale: 5 = strongly agree, 4=agree, 3=neither agree or disagree, 2=disagree, 1=strongly disagree).

<table>
<thead>
<tr>
<th>No</th>
<th>Difficulties of sharing new knowledge across projects</th>
<th>Select and rank those applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Project team members don’t see any benefits in getting involved in post-project reviews</td>
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<td>ii</td>
<td>It is not mandatory to use ‘lessons learned’ of past projects when starting a new project</td>
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<td>iii</td>
<td>Difficulties in coordinating debriefings – persons already engaged in other new projects</td>
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<td>iv</td>
<td>Experience ‘reflection’ &amp; recording not integrated into project management processes</td>
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<td>v</td>
<td>High time pressure towards the project’s end (i.e., completion pressure, new tasks awaiting)</td>
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<td>vi</td>
<td>Fear of negative sanctions (in case of disclosing mistakes)</td>
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<td>vii</td>
<td>Having only project reviews at the end of the project</td>
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<td>viii</td>
<td>Don’t have an organizational learning culture</td>
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<td>ix</td>
<td>Lack of incentives explicitly tied to project learning</td>
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<td>x</td>
<td>Too focused on short-term project deliverables (i.e., meeting immediate milestone)</td>
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<td>xi</td>
<td>Others, please specify:</td>
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</tbody>
</table>

After filling-in the questionnaire, please email back the questionnaire (as an attachment) to either of the two email addresses: liya0001@student.umu.se or wima0002@student.umu.se.

We would like to express - in advance - how very grateful we are for your understanding help in filling-in the questionnaire. All information provided will be treated with strictest confidence, for academic purposes only, and no identity of any respondent will be revealed in the MSc dissertation.

Yours sincerely,

Lina Yan & Wise Mainga.