International Review of Business Research Papers
Vol. 6. No.3. August 2010 Pp. 129 -156

An Examination Of The Nature And Type Of 'Organizational Learning Infrastructure' That Supports Inter-Project Learning In Swedish Consultancy Firms*

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Past researches has identified project-learning as crucial to the long-term market success of project-based firms (PBFs). Project success is partly dependant on the ability of project teams to be able to extract as much new knowledge acquired from past projects undertaken by the firm and transferring the new knowledge gained to other (current and future) projects. 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. 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. The primary aim of this research paper is to explore, describe and analyze the various components of 'organizational learning infrastructure' that have been developed by a sample of consultancy firms in Sweden to support and enhance interproject leaning. The study examines what type of learning infrastructure, systems, procedures, and routines have been built-up to support and promote organizational-wide interproject learning in consultancy firms in Sweden. The research paper interrogates the 'perceptions' of key informed project management practitioners, who have experience of managing consulting projects. The study finds that most respondents indicate that their firms had good or strong practices related to the following; implementation of multi-disciplinary self-managing project teams, removal of organizational/functional boundaries, and having deliberate processes to capture, document, store and distribute new project knowledge. However, some of the basic learning-supporting infrastructure necessary to support project learning were not fully developed (i.e., explicit scheduling of time to do 'reflections' during and after project execution, emergency 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). Such underutilized practices provide greater opportunities for future improvements. A number of recommendations are outlined in light of research findings.

Keywords: Interproject learning, organizational learning infrastructure, project competencies, project-based firms, consultancy sector.

Field of Research: Management

1. Introduction

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". 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

* The paper uses some of the survey data that was collected by the author when he was doing the MSc thesis at Umea University, Sweden.

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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. It is continuous improvement in project processes 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". As human capital has largely replaced physical human capital as a source of sustained competitive advantage, learning at various organizational levels has "emerged as a key enabler of success" (IBM, 2003,p2).

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 (Koners 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. Realizing these deficiencies or gaps in knowledge and project management practices, this paper makes an exploratory attempt at understanding the nature of 'learning-supporting' infrastructure in one sector that tends to be critical in knowledge generation and dissemination in developed economies – the Consultancy sector.

The structure of the research paper is as follows. The research objective of the study is covered following this introductory section. The research questions are covered in Section 3. The theoretical framework underpinning the study is covered in Section 4. Section 5 outlines the main research methodology used for the study. Section 6 covers the Data analysis. The discussions of results and conclusions of the study are given in Section 7.

2. Research Objectives

The prime research objective is to explore, describe and analyze the perceived nature of 'organizational learning' infrastructure that has been developed in consultancy firms

in Sweden. To be specific, the prime research objective has been broken down into three sub-objectives.

The three research objectives are:

(i) To examine the extent to which project learning processes are embedded in 'project planning' and 'project execution' phases.
(ii) To identify factors that affects the sharing of new knowledge across projects.
(iii) To determine – from project management practitioners' perceptions – the extent to which different components of 'organizational learning' infrastructure (i.e., learning systems, procedures, and routines) have been built-up by consultancy firms to support and enhance inter-project learning.

Most studies done on project-based firms have been done in engineering, technology, constructions and R&D sectors. 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 much 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.

3. Research Questions

To achieve the above research objective, three main research questions were developed. The main research questions are:

(i) What is the extent to which project learning processes are embedded in 'project planning and execution' phases in Swedish consultancy firms?
(ii) Which factors affects the sharing of new knowledge across projects in consultancy firms in Sweden?
(iii) What is the extent to which learning-supporting 'infrastructure' (i.e., learning-supporting systems, procedures, and routines) have been built-up to support and enhance interproject learning in targeted firms?

4. Theoretical Framework

This section has two main parts. The first part briefly explains the concepts of project learning (inter project learning). This is followed by the second part which covers the various learning-supporting 'infrastructure' needed to promote or facilitate inter-project learning in project-based firms. Project-based firms (PBFs) are those companies which organize all or a large portion of their operations or work as projects (Lindkvist, 2008). 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.

4.1. Project-Learning

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). 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). 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 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* learning refers to knowledge creation and flow that takes place across projects or from projects to and from the parent organization. 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). *Intraproject* learning refers to knowledge flow within each project team. 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).

There are major benefits that can accrue from enhancing project learning processes in 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). For these gains to materialize, project 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).

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, as well as, associated project competencies. 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).

4.2. Organizational Learning Infrastructure Needed To Support Inter-Project Learning

The concept of 'organizational learning infrastructure' has been developed within a diverse literature aligned to perspectives associated with the notion of Organizational learning, Learning organizations, and Knowledge management. The term is not without controversy, however. Suggestions to use alternative terms have been made in various studies. such as 'organizational learning architecture', 'knowledge infrastructure', 'knowledge management infrastructure', 'infrastructure for organizational learning', learning landscape, and 'organizational ecosystem' (Huber, 1991; Senge, 1990; IBM, 2003). While acknowledging the conceptual importance of the debate about the appropriate term(s) to use, in this research paper, we largely skew the debate. We accept the richness of the debates surrounding the various concepts and terms, but also realize that most of the ingredients of the conceptual debates acknowledge the importance of establishing an organizational culture that continuously develops and refine competencies; makes deliberate efforts to move towards excellence; instills organizational processes, procedures, tools, templates, policies, incentives and metrics needed to acquire and leverage various types and source of knowledge, in order to enhance an organization's long term competitive advantage (Quinn, 2008). Our adapted definition of Organizational learning infrastructure is similar to the one adopted in the study by Strohmaier & Tochtermann (n/a);

> "…. Knowledge infrastructures are defined as the set of all successfully implemented interventions, measures, institutions and facilities that represent a supportive environment for knowledge workers who execute knowledge intensive tasks. The knowledge infrastructures consist of three main dimensions; 1) people 2) organizational- and 3) technological systems, whereas knowledge is defined to be information that is relevant for business actions" (p2).

At a generic level, the organizational learning infrastructure is meant to foster learning across multiple levels in an organization, and the development of adaptive capabilities. 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).

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 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 or future projects (Anbari *et al*., 2008; Newell and Edelman, 2008).

Developing an 'organizational infrastructure' is critical in helping organizations capture knowledge and experiences gained from projects. Firms are encouraged to scrutinize organizational processes and routines to realize behavioral and performance improvements (Nelson and Winter, 1982). Organizations gain from learning by means of transforming inferences from history into routines which guide organizational behavior (Levitt and March, 1988). Anbari *et al.* (2008) suggests that project management structures should accelerate and facilitate the information flow. Structures such as the Project Management Office [PMO] must manage and control projects across the firm, and multi-functional project teams are recommended in implementing projects. Aryris and Schon (1978) suggests several 'enablers' which are useful in facilitating organizational learning. These suggestions include; flat and decentralized organizational structures, information systems that facilitates information flow, devising proper system of incentives, encouraging boundary crossing and openness. Since the end of 1950s, researchers consider it important to conduct project reviews 'formally' and in a structured way (Weinberg and Freedman, 1984). More and more researchers recommend 'project post-mortem' (Collier *et al.*, 1996; PMI, 2000) or a 'retrospective' (Kerth, 2000) as a means to document both the positive and negative experiences from executing projects. In this line, Collier *et al*. (1996) suggested a standardized process for post-project reviews (PPRs) which may include; documenting procedures, installing communication channels, doing blame-free analysis, and a balance of the benefits and costs of PPRs. Apart from these formal structured processes, it is suggested that informal processes such as having seminars, staff meetings, and 'communities of practice' should allow the procedure-oriented culture to permeate the firm, one pre-condition for improved project and firm performance. It has been agreed by researchers that a 'learning culture' is critical for organizational learning. A 'learning culture' is one 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).

5. Research Methodology

The aim of this *exploratory* study was to examine the extent to which effective systems, procedures, and routines have been developed to support/facilitate project learning among consultancy firms in Sweden. Findings from this 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.

The unit of analysis in this study are the organizational 'processes' used to facilitate the capture, accumulation and transfer of new knowledge generated within projects (i.e., during the execution of a project) to other projects or 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 (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 in 2008 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 returned questionnaire had a lot of subsections that were not completely filled-in, the analysis focuses on only the remaining eight (8) usable questionnaires. In the absence of time limitations, the researchers would probably 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, and 2 were at the director level 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.

6. Data Analysis

The data analysis is arranged following the order of the three sub-questions covered in this study. We, therefore, discuss the answers to each research sub-question in sequence. The analysis starts with examining the extent to which learning processes were embedded in 'project planning and execution' phases of projects undertaken by respective consultancy firms. The analysis also refers to specific questions that are given in the attached survey questionnaire.

6.1. Embeddedness Of Project Learning Processes During Project Planning And Execution Phases

Leveraging experiential knowledge into project planning and execution phases is envisaged at very high levels of the capability maturity model (Software Engineering Institute, 1995). The embeddedness of project learning processes, its importance and benefits are exemplified by the concept of a 'super' project manager;

> "…. there exists a 'super' project manager who consistently executes projects successfully, whose estimates are generally on target, and who seems to avoid the 'fire fighting' mode most of the time. Clearly, this project manager has acquired the knowledge to properly perform the various tasks associated with project planning and execution through experience" (Jalote, 2000, p1).

The objective of Q6 in the attached survey questionnaire was to pick up information on the extent to which project learning processes were embedded within work packages associated with the project planning and execution phases. The survey results are shown in Table 1 below. The respondents were asked the extent to which they agreed or disagreed with each statement given in Table 1. 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 given on the right end of Table 1 shows the number of respondents who ticked each box.

We first examine the embeddedness of project learning processes during the 'Project planning' phase. While cautious of the problem of small numbers, it is still possible to see some (limited) patterns among the responses given by the 8 respondents. With regards to the Project Planning stage, 5 respondents agreed or strongly agreed that project teams in their organizations reviewed past 'project plans' when making plans for new projects. Three (3) respondents were neutral to the statement that their firms consulted past 'project plans' during the project planning stage. However, answers by respondents were slightly different when asked whether their project teams reviewed 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 more readily reference past 'project plans' than they do consult past 'lessons learned' documents or databases.

Table 1: Embeddedness of project learning processes during Project planning & Project Execution Phases

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

*** = Number of respondents who ticked each cell**

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 they explicitly schedule time to do milestone reviews during their project planning stage, while only two(2) respondents were neutral to the same statement. On the other hand, only 1 respondent agreed that his/her firm does explicitly include knowledge from previous post-project reviews when drafting new project plans. Two other respondents were neutral to the statement, while a total of five (5) either disagreed or strongly disagreed that their respective firms explicitly included information found in 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 more related to future or other concurrent projects. In a sense, a post-project review has no direct impact on the ability to deliver the same project that is being planned. The relevance of the knowledge gleaned when conducting a post-project review for a particular project, 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, not for the project at hand. This result, however, limits the utility of 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 the some what 'negative' outlook given by the above finding, the results shown in Table 2 below seem to suggest that almost all the firms represented in the study 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 conducted post-project reviews only on projects that had major problems. We need to understand the underlying reasons why targeted consultancy firms tend to have formalized or institutionalized mechanisms to ensure post-project reviews are done, but information and project lessons gleaned from such reviews are not fully utilized during the project planning phrase of future projects.

Table 2: Frequency of conducting Post-Project Reviews (PPR)

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

Source: Survey Data

Getting back to Table 1, we now turn to examining the extent to which project learning processes are embedded into the 'execution' stage of projects done in respective firms. Starting with the positive aspects first. Table 1 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 on this aspect. 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 willing 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 project 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 encountered during project execution was done in respective firms. 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 teams 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 the embeddedness of project learning processes in target firms' project planning and execution phases, the analysis now turns to examining the factors that are perceived to negatively affect the sharing of new knowledge or 'lessons learned' across projects. In doing so, we move on to answering the second research question.

6.2. Difficulties Of Sharing New Knowledge Across Projects

The information given in Table 3 was derived from answers given to Q9 in the survey questionnaire. The listed factors were put together after an extensive the survey of relevant literature. 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 3. 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).

Table 3: Factors that hinder knowledge transfer across projects

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

*** = Sum of total rankings in a particular cell/Number of respondents who ranked the item**
**** = Number in brackets show order of ranking**

Source: Survey Data

With regard to the level of impact, we are interested with items that respondents on average either agreed or strongly agreed. In Table 3, we have atleast three items that on average 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' at this stage – 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 – is related to the first factor. 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 couple of months after the project has been completed, most of the project team members would have long dispersed and/or unavailable.

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 low 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 find that some project team members don't find or see any value in taking part in post-project reviews, as they do 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 portray 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.

6.3. 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, routines, personnel 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 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 suggested by the relevant established literature. Despite separate discussion of each facet (i.e., each row in Table 4), we acknowledge that it is the complementarities and interactiveness of the various facets that actually lead to dynamic 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 project-based firm.

Table 4: Organizational Learning Infrastructure

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

*** 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.**

Source: Survey Data

We start our analysis of the organizational learning infrastructure, by examining responses shown in Table 4. The responses were derived from Q8 in the survey questionnaire. The question asked respondents to rank the extent to which various learning systems, procedures and routines were implemented in their organizations. Respondents were asked to rank on a scale 5 to 1. 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 4 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 conducting post-project reviews could lead to knowledge loss, through lost of memory and/or disappearance/none availability of former key project team members.

When we examine the whole of Table 4, 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. Only one respondent indicated that his/her company had a good implementation of a 'no blame culture', with two respondents being neutral to the statement. Yet a 'no blame culture' is what is needed 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, atleast for the five firms, respondents felt that more work was still needed to install a culture of openness to experimentations in their respective firms.

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 in 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 on 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 whether it was a result of a move towards more electronic based forms of communication.

As shown in Table 2, 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 4 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 2 & 4 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. Such information was captured in Table 3.

7. Discussion and Conclusions

This section briefly discusses the exploratory results from the Data Analysis section, in light of the literature on project-based firms. In areas where our findings are similar to past research results, we highlight past research 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 the previous section. We start by discussing the data analysis results to the first research sub-question, before moving to answers given to the second and third research sub-questions. Finally, we give tentative conclusions drawn from the research.

In this exploratory study, most respondents agreed that multi-disciplinary team that cut across functional boundary existed in their firms. This is in line with the other empirical studies (i.e., Ayas, 1997; Prencipe and Tell, 2001; Williams, 2004). From our findings, most respondents thought their organizations had good or strongly implemented deliberate project learning supporting 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 in place a knowledge management strategy, and another 41% had plans 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 undertaken in such organizations.

However, even with the implementation of deliberate project learning supporting processes, metaphors and project 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). For example, Newell and Edelman (2008) indicate in their study that some of the project team members studied did not consider project databases as helpful. As a result, project team members did not really consult project databases, and believed that the uniqueness of each project makes them less helpful as a basis of learn for work on future projects. These findings are also consistent with the study done by Zedwitz (2002). Moreover, Williams (2003) indicated that in practice, some individual firms studied did 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, 2006).

Irani and Love (2000) emphasizes 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 in project-based firms, where the two firms with 'lessons learned' databases did not share the database information and paper-based minutes to the rest of the company. Information was only shared among project team members. Their results are similar to our finding, which shows that 5 of the 7 respondents disagreed with the statement that project teams in their respective firms used "paper-based reports that describe learning from each project" were readily circulated through out the company.

This survey question which sort to examine the extent to which organizational infrastructure to support organizational-wide project learning had the most mixed results. This might, in part, be due to 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.

From the above discussions, a few 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 the embeddedness of project processes in project planning and execution phases, and the organizational infrastructure developed to support project learning.

From this exploratory study, project-based firms (PBFs) may well be advised to institutionalize various 'learning-supporting' infrastructure or processes that can enhance the accumulation of relevant project knowledge (Brady and Davies, 2004; Soderlund *et al*., 2008; Williams, 2003). Investments in interproject learning must be seen as mission critical, where the focus shifts to "designing and implementing an enterprise learning strategy and governance model that can drive organizational performance" (IBM, 2003, p7). 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). The end goal of investment in building a good learning-supporting infrastructure should be a "skilled workforce with the ability to address the evolving market-place challenges and adaptive to environmental challenges in the most responsive, focused and effective manner" (IBM, 2003, p11). Leveraging the various past experiences and lessons learned has been found to be critical to successful

execution of new projects, contributing to reduced project costs, cycle time and quality of project delivery (Jalote, 2000). A competent learning-supporting organizational infrastructure has been associated with firms' ability to adapt in today's very competitive, dynamic and rapidly changing environment.

Any exploratory study would inevitably have limitations. For our study, two main limitations can be highlighted: (i) Due to the fact that we could not get access to one or two consultancy firms to enable us to do some in-person interviews, we could not do any meaningful 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 focused only on 'perceptions' of key informed 'project management practitioners' with some managerial responsibilities. It might be helpful in future studies to capture the perceptions of other project team members who may not have managerial responsibilities. In addition, future research could focus on generating more refined 'objective' measures to capture the extent to which various dimensions of the organizational learning-supporting infrastructure are developed in consultancy firms, and how these can statistically be linked to organizational performance. Our study captured 'perceptions' rather than what can be called 'hard' indicators. All the above mentioned limitations of the study provide opportunities for future research direction.

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Appendix – 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, Umea University, Umea 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.).

No	Mechanisms of transferring 'lessons learned' on one project to other projects	Select and rank those applicable
i	Project documents (i.e., project manuals, status reports, process maps, surveys, etc)	
ii	De-briefing meetings	
iii	Person-to-person informal discussion with work colleagues involved in other projects	
iv	Cross-staffing of experienced project team member(s) to a new project	
v	Use of 'Lessons learned' database	
vi	On-going project review meetings (i.e., milestone/stage-gate reviews, review workshops, project team meetings, etc)	
vii	Recruitment of external expertise to be part of project team	
viii	Ad-hoc meetings	
ix	Post-project reviews (i.e., Case writing, use of external auditors, project history files, etc)	
x	Informal organizational routines (i.e., project team/managers' camp outings, central meeting place, storytelling sessions, etc)	
xi	Groupware/intranet & Forum (i.e., micro articles by email, request for information, etc)	
xii	Others, please specify:	

Q5. How often do you do Post-Project Reviews (PPR) in your company? (please put an 'X' in the appropriate box selected)

No	Item	Mark box
i	We do post-project reviews on all projects	
ii	We do post-project reviews only on major projects	
iii	We do post-project reviews only on projects that had major problems	
iv	There is no fixed criteria used to select projects that are subjected to post-project reviews	
v	We don't do any post-project reviews	

Mainga

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.

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

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.

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

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

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

Mainga

Q9. Which factors do you think hinders 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).

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

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.