

**KNOWLEDGE MANAGEMENT CHALLENGES IN
TELECOM IT PROJECTS IMPLEMENTATION**

Don Ravindra Naleen Jayasuriya

(138409E)

Degree of Master of Science

Department of Building Economics

University of Moratuwa

Sri Lanka

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Don Ravindra Naleen Jayasuriya

(138409E)

Thesis/ Dissertation submitted in partial fulfillment of the requirements for the
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Department of Building Economics

University of Moratuwa

Sri Lanka

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DECLARATION

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ABSTRACT

There are many Information Technology related projects currently being implemented in telecommunication industry. This research work will benefit for all IT project managers in telecom industry in Sri Lanka and System Implementers of such projects. This research project identified the importance of knowledge management in IT project implementation in telecom sector which enable the project managers to think about the project knowledge management in the project organization.

The knowledge management techniques vary with one IT project to another IT project. This research work is to study the effectiveness of knowledge management (KM) techniques used in IT projects implementation at SLT. It also to rank the successful KM methodology and identify the challengers in KM in IT project implementation. Based on the outcome of this research, IT project managers can identify the most effective knowledge management technique to be used in his project. It is also identify the challenge that has to be faced when implementing the project knowledge management techniques.

It was found that brain storming is the best knowledge management methodology used in planning stage and “learning & Idea capturing” is the best knowledge management methodology used in designed stage. In the testing stage “After action review” is the best method to be used. Therefore different knowledge management methodology can be recommended for stage.

Keywords: *IT – Information Technology, KM – Knowledge Management*

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LIST OF ABBREVIATIONS

Abbreviation	Description
IT	Information Technology
KM	Knowledge Management
SLT	Sri Lanka Telecom
CRM	Customer Relationship Management
ERP	Enterprise Resource Planning
OSS	Operation Support System
BSS	Billing Support System
PKM	Project Knowledge Management
SI	System Integrator
RII	Relative Importance Index
AAR	After Action Review

CHAPTER 1

INTRODUCTION

1.0 Introduction

This chapter explains the overview of this research study. Further the chapter explains the identification of the research problem, Objectives, expected outcome of the research work.

1.1 Background of the Study

1.1.1. Introduction to research

There are many Information Technology related projects implemented in telecommunication industry. In telecommunication industry IT systems such as Customer Relationship Management (CRM) system, Enterprise Resource Management (ERP) system, Billing support systems, etc. provide the support function for the main business. The telecom network provides the core business functionality. The natures of the IT projects are different with other projects. Most of the IT projects address the process automation, such as implementation of CRM system and Operation Support system (OSS) automate the service fulfillment and service assurance processes. Where the implementation of Billing Support System (BSS) will automate the service billing processes. By implementing such IT systems the percentage of process automation increase and manual intervention for the business is minimized. The completion of such projects, help to increase organizational efficiency, more visibility towards the organizational activities, easy report generation, easy performance monitoring, etc.

Knowledge management comes into play where the utilization of the gathered knowledge towards the betterment of the future activities. Basically KM consists of Knowledge Creation, Knowledge Transfer and Knowledge Use. The knowledge transfer take place in two ways such as direct knowledge transfer (personalization) and indirect knowledge transfer (codification). (Raymund, S, 2006). There are different

methodologies used for direct knowledge transfer and indirect knowledge transfer of projects environment. The methodology used in knowledge management vary with the industry. In IT projects, set of knowledge management methodologies used by the relevant IT project managers and team members. Especially the knowledge management techniques vary with the IT projects too. Knowledge management techniques used for the OSS implementation projects differ with the ERP implementation projects. Further the knowledge management methodology varies with the project phase, where knowledge management technique used at the “Designing” phase may not be the knowledge management methodology used at the “Implementation” phase.

When implementing the knowledge management techniques in IT projects many challenges are faced by the implementers. It is required to identify the challenges in implementing the said KM techniques and identify how such challenges are overcome by in such projects. It is required to see the success of such knowledge management methods used by the different IT projects. The effectiveness of the knowledge management methodology vary with the project phase. Where one knowledge management methodology more effective in one phase of the project and it may not be the best knowledge management methodology for another phase of the same project.

What is knowledge

*“**Knowledge** is a familiarity, awareness or understanding of someone or something, such as facts, information, descriptions, or skills, which is acquired through experience or education by perceiving, discovering, or learning”.*
(www.wikipedia.org)

What is knowledge management

*“**Knowledge management (KM)** is the process within the organizational structure which allows the evolution between tacit and explicit knowledge in order to strengthen the firm through their employees.” (Nonaka, I, 1991)*

1.1.2 Importance of the study

This research work will benefit for the all IT project managers in telecom industry in Sri Lanka and System Implementers (SI partners) of such projects. This study will identify the importance of knowledge management in IT project implementation in telecom sector which highlights the project managers to think about the role of a project knowledge manager in the project organization. The other benefit passed from this project is to identify the most effective knowledge management methodology that project manager or project system Architects need to select. The outcome of this project will also deliver the most used knowledge management methodology at each stage of the project. The study will deliver the effectiveness of the knowledge management methodology used in each stage of the project. This will support for the ongoing projects as well as for the future project managers when planning new projects.

In case of ongoing projects where project are yet to complete, managers can think about the knowledge management methodology for the next stages of the projects based on the outcome of this research. Similarly project managers of future projects can use this research outcome for selecting appropriate knowledge management methodology in their projects.

The other outcome of this research is the identification of challenges in implementing the knowledge management methodology. Further, before starting of the project, the project managers can have an idea about what the challenges to be faced when implementing certain knowledge management methodology, it will facilitate them to overcome those challenges. The finding can used for their planning stage of the project and can address those challengers at the start of the project. Further the ranking of the challenges will provide them some idea of filtering the challenges. Most probably this will provide them to make their project a success.

In most of the cases IT projects are not properly facilitating the knowledge management where least priority is given to knowledge management activities. As a result of this research they can think about the benefits of properly handling knowledge management in their future IT projects implementation.

1.2 Identification of Research Problem

Most of the telecom operators spend considerable amount of money in implementation of IT projects. By implementing such IT project they cannot get direct benefit from them. For an example, implementation of ERP system does not directly contribute to increase in the sales or increase in the customer base. IT projects will act as a support system to make the overall operations of the organization function easily. In other words IT projects perform the process automation of the organization, which will increase the organizational efficiency and indirectly contribute to the organization profits. Unlike the network projects, amount spent on IT projects cannot be directly recovered. However each telecom operators spent a considerable amount of money for IT projects.

Since many IT related projects implementation take place in telecom industry the knowledge on IT project implementation is vital for the telecom operators. Which will makes their future project more success. Most of the time success rate of the major IT projects implementation is low. Hence gathering the IT project implementation knowledge for telecom operators is important. Due to different reason the knowledge management of IT project management is very challenging. Due to that many project managers not properly handling the KM in IT project management. Due to lack of KM in IT project management the success rate of the IT projects is low.

It is required to identify how KM is applied in Telecom related IT projects. IT projects in telecom industry is different with other projects in telecom industry. Where this research is to identified the challengers in KM implementation in Sri Lanka telecom IT projects implementation.

1.3 Research Objectives

Following are the objectives of this research study;

- Identify the methodologies used for KM in IT project implementation
- Rank methodologies to identify the most successful KM methodology
- Identify the challenges in KM in IT project implementation

- Identify the areas that needs to improve the KM practice in IT project management

The first objective in this research is to identify which knowledge management methodologies most suitable for the IT projects and on what stage. This research is to identify the knowledge management methodologies appropriate for each phase of a project. In addition effectiveness on such knowledge management methodologies for the project needs to be considered.

The second objective is to rank the KM methodologies based on the successfulness of them. In this case it can be used for KM methodologies applied in different stages of the projects. The KM methodology most success in planning stage of the project may not be the best KM methodology for building stage.

The third objective of this research is to identify the challenges that the project manager or project knowledge managers face when implementing the knowledge management methodologies.

The fourth objective of this research is to address the action that needs to take to overcome the challenges when using knowledge management methodologies. Basically identify the areas that need to improve when apply the KM in IT project implementation.

1.4 Scope of the Study

This project addresses only the knowledge management within the IT projects implementation in telecom industry in Sri Lanka. Basically this research considers the IT projects implementation at Sri Lanka Telecom. This research considers only the projects which are presently being implemented and IT projects which completed within the year 2015.

CHAPTER 2

LITERATURE STUDY

2.0 Introduction

This chapter covers the literature review of the project. Mainly this cover the literature review on knowledge management and project knowledge management. The first part address the knowledge management research projects related to telecom industry. The second part address the literature on project knowledge management related to IT projects.

2.1 Literature on Knowledge Management

Different authors defined the knowledge in different ways. Davis and Botkin (1994) defined knowledge as “the application and productive use of information”. Knowledge can be differentiated between explicit and implicit knowledge, individual and collective knowledge, declarative, procedural, and experience-based knowledge. (Bastian Hanisch, Frank Linder, Ana Muller and Andreas Wald, 2008). Polanyi (1962) differentiates two dimensions of knowledge: Explicit and implicit (or tacit) knowledge. Explicit knowledge refers to knowledge about things and facts while implicit knowledge is linked to experience and cognition. This differentiation helps to develop and apply special mechanisms for managing knowledge. Nonaka and Takeuchi (1995) introduced a model of knowledge management that explains the processes that transform implicit into explicit knowledge. Knowledge combines experience, values, contextual information, and insight to create a framework to evaluate and absorb new experiences and information (Coakes, 2004; Davenport & Prusak, 2000). Szulanski (1996) suggests that knowledge transfer occurs in four stages: (1) initiation (need for knowledge), (2) implementation (search for knowledge), (3) ramp-up (use of knowledge), and (4) integration (“routinization” of knowledge).

Several ideas and concepts of knowledge management (KM) have been developed over recent years. Understand knowledge management as a process of systematically

and actively identifying, activating, replicating, storing, and transferring knowledge. They have developed a model of KM consisting of seven blocks: knowledge aims, identification, acquisition, development, distribution, use, and preservation. Nonaka and Takeuchi base their model of KM on the separation of implicit and explicit knowledge and identify processes of transformation between these two types of knowledge. In a process of socialization, tacit knowledge is transformed into new tacit knowledge; in the process of externalization, this tacit knowledge is transformed into explicit knowledge. (Reich, B. H., Linder, F., Muller, A., & Wald, A. 2008).

Because we wanted to examine the knowledge reuse associated with soft skills, managing user expectations was a reasonable choice of the problem due to its importance and prevalence in IT projects. Knowledge management is not a purely managerial activity because it may be performed by all project team members and not only by the management team. Each team member, especially in a project that makes intensive use of knowledge, can and should take part in the creation, storage, and distribution of knowledge (Damm & Schindler, 2002).

Knowledge may be put into an organizational repository not only for the purpose of solving a particular problem. Many organizations have organizational units or teams for the purpose of acquiring knowledge from external sources, with the goal of increasing general organizational capabilities or for the needs of specific projects. Knowledge for a project may also be acquired from outside an organization on its own. (Stanislaw Gasik, 2008).

The knowledge is passed from the project level to the organization level in order to distribute it to other projects that are implemented by the organization (or use it in line processes). Knowledge is passed from the organization level to the global level for the purpose of using it in global sources of knowledge.

2.2 Literature on Project Management

There many literatures on project management and few for IT project management. There are different skills required for the project manager to handle the project and it

can be a hard skills or soft skills. The soft skills needed by a project manager include skills related to communication, organizational culture, leadership, problem solving, and decision making, team building, flexibility and creativity, and trustworthiness (Muzio, Fisher, Thomas, & Peters, 2007). When considering the IT related project management the soft skills are highly required.

2.3 Literature on Project knowledge Management

Project knowledge management (PKM) is knowledge management practiced in project situations. It creates the link between the ideas and principles of knowledge management and project management. PKM involves two basic perspectives: the inter-project and intra-project perspective. Depending on the size and structure of a project, subprojects—or inter-project constellations—could exist within a project. Because of this, a clear differentiation between the two perspectives is not always possible. Love, Fong, and Irani (2005) made a valuable contribution by setting the base for understanding knowledge management in project environments. In their work regarding the role and processes of knowledge management in project environments, they set a particular focus on knowledge management in the context of cross-functional and international project teams as well as on the role of (organizational) learning in projects. These findings are regarded as state of the art in research and literature.

Schindler (2002) builds a framework of Project Knowledge Management (PKM) and identifies three major types of knowledge in project environments. Such as knowledge about projects, knowledge within projects, and knowledge from/between projects. Knowledge within projects is closely linked to the project management methodology. These are dependent on the project manager and the individual project management style. The knowledge transfer from and between projects can be categories to four main parts: such as expert knowledge, methodological knowledge, procedural knowledge, and experience knowledge. Knowledge from projects contribute to the organizational knowledge base.

In the literature, it is identified that there are many challenges in project knowledge management (Love et al. 2005; Schindler, M. & Eppler, M. J. 2003). Some of challenges identified in literature survey can be summed as follows;

- Projects are temporary.
- Projects are unique and singular.
- Projects are linked with a changing work force, a new constellation of people working together.
- Project are in many cases short-term oriented.
- Projects are a platform for the integration of internal and external experts.
- People in projects have to adapt quickly to new general conditions and contents of work.
- Projects lack an organizational memory, routines, and other mechanisms of organizational learning.

The project-based organizations is require to think about how it is going to select new knowledge, where it is going to store it, and what it needs to create a fourth step of knowledge management, distribution of knowledge to new projects. “In spite of recent advances in our understanding of how to manage knowledge, its capture and transfer remain acute problems for project-based firms and organizations” (Hall & Sapsed, 2005, p. 57).

“Without the reuse of existing knowledge or the ability to create new knowledge from existing solutions and experiences, project organizations have to create solutions to every problem, which is clearly inefficient” (Love et al., 2005, p. XV).

PKM contributes to the reduction of project risks through awareness of mistakes and pitfalls of former projects (Schindler & Eppler, 2003).

Project knowledge is managed at four distinct levels: individual, project, organization, and global. The article describes the micro-knowledge life cycle and macro-knowledge life cycles from each organizational level, as well as the processes of vertical knowledge flow between organizational levels.

Some literature on project knowledge management explain that the one of the main reason that projects failure was “not managing the project knowledge management properly”. Project knowledge management, especially in complex projects, is one of the main success factors in project management.

A person assigned to a project brings the knowledge he or she possesses at that time to the project team. This is the technical or managerial knowledge collected during all the former education, training, and participation in completed projects. (Stanislaw Gasik, 2008)

After completing the project, the team member attains a new level of knowledge.

This forms the basis for the process of knowledge management planning, which produces the project knowledge management plan (PKM Plan). The PKM Plan addresses all the topics related to project knowledge management and covers both the personalized and codifying techniques of knowledge management (meetings, knowledge exchanging teams, and using knowledge repositories) in alignment with project type and needs. (Stanislaw Gasik, 2008)

Project knowledge management comprises processes that aim to generate, utilize, and distribute the micro-knowledge necessary for project execution and processes that are performed on the macro-knowledge of people at all organizational levels and that aim to increase the capabilities of direct or indirect participation of people in effective project execution or to increase their possibilities for influencing project execution.

While the organization and professional groups can be helpful at capturing, packaging, and disseminating knowledge related to the technical skills required by an IT project manager, reusing knowledge associated with soft skills is overlooked by many organizations. Yet mastery and knowledge of soft skills is believed to be necessary for an IT project manager to be successful (Sukhoo, Barnard, Eloff, Van der Poll, & Motah, 2005).

The need to retain knowledge and lessons learned from IT projects is important to organizations (Schindler & Eppler, 2003). Knowledge is often lost after a project is

completed or when the team members move on to other activities (Schindler & Eppler, 2003).

Because of its nature, collecting tacit information will involve a high degree of personal interaction. Tacit information will be collected from a number of sources:

- Phase-end and project-end interviews – These leverage a detailed debriefing process, which uses a question-and-answer interview format.
- Cross Project workshops on key topics – These workshops use a common Six Sigma problem-solving approach – affinity diagramming – to brainstorm solutions.

The knowledge in projects can be structured in different clusters, so called knowledge domains. Those domains could be knowledge about customers, partners, competitors, methodologies, technical / non-technical solutions components etc.

Although project managers have tools available to enable knowledge reuse across projects, these tools often do not produce the expected results or intended benefits. Project managers are found to rely more on social networks rather than on these tools when there is a need for knowledge.

Yoo and Kanawattanachai (2001) tracked the progress of 38 virtual project teams and found that project success was strongly influenced by each team member's knowledge of other team member's areas of expertise and by the team's ability to harness this knowledge to achieve the project's goals.

2.4 Literature on IT Project Knowledge Management

However, discussions with project managers have indicated that IT projects are becoming more ambitious, more organizationally and technically complex, and more time-to-market focused. Acceptable project performance may still be an elusive target (Sauer & Reich, 2006).

Increasingly, IT projects are relied on by organizations that are trying to innovate or to respond to competitive threats. Transformations such as mergers, supply chain integration, and customer service innovation are necessary for organizations to survive and prosper. Therefore, the high failure rate of IT projects is a major stumbling block to companies that are trying to innovate through new processes and services.

A project manager's primary task is to manage the knowledge bases of the team members and stakeholders so that they combine in the best possible way to successfully accomplish their assignment.

Knowledge management in the context of a project is the application of principles and processes designed to make relevant knowledge available to the project team. Effective knowledge management facilitates the creation and integration of knowledge, minimizes knowledge losses, and fills knowledge gaps throughout the duration of the project. (Blaize Horner Reich, Simon).

There are four types of knowledge important to the success of IT projects: process, domain, institutional, and cultural.

We originally used the term “Knowledge Trap” to identify those times or events within an IT project in which there is a loss of project-specific knowledge, where the project lacks some relevant knowledge, or where knowledge is not created or applied optimally (Reich, B., H., 2006).

There are five knowledge risks within the main body of an IT projects. That is the knowledge integration, knowledge transfer, loss of team members, lack of a knowledge map, and loss between phases.

IT project managers and team members make a multitude of interrelated decisions. The more difficult the domain problems are, the more important it is that team members possess a knowledge map—information on the knowledge within the team (i.e., *who knows what*) and the knowledge available to the team—that enables them to address complex problems efficiently and effectively. (Reich, B., H., 2006)

The need to retain knowledge and lessons learned from IT projects is important to organizations (Schindler & Eppler, 2003). Knowledge is often lost after a project is completed or when the team members move on to other activities (Schindler & Eppler, 2003).

Many organizations neglect to capture this knowledge within repositories or training courses for IT project managers, yet it is these lessons that may be key for the success of IT projects.

Because we wanted to examine the knowledge reuse associated with soft skills, managing user expectations was a reasonable choice of problem due to its importance and prevalence in IT projects.

The need to retain knowledge and lessons learned from IT projects is important to organizations (Schindler & Eppler, 2003). Knowledge is often lost after a project is completed or when the team members move on to other activities (Schindler & Eppler, 2003).

Unfortunately, valuable knowledge gained on IT projects is rarely captured and utilized. Failing to retain knowledge from past projects suggests that solutions are reinvented, mistakes are repeated, and process knowledge is lost. (Tiwana & Ramesh, 2001)

Within an IT project, focus on knowledge yields new insights because IT projects are primarily knowledge work. (Reich, B. H., Gemino, A. & Sauer, C. 2012)

2.5 Literature on Knowledge Management Techniques

There are few literatures on KM techniques. Raymund Sison (2006) identified some KM techniques which are IT based and non IT based. As per his identification, Brainstorming, Learning & Idea Capturing, After Action Review were categorized as non IT based KM techniques and Blogs, Refer Knowledge Bases are categorized as IT base KM techniques.

“Brainstorming” KM technique;

“Brainstorming is a simple way of helping a group of people to generate new and unusual ideas.” (Raymund Sison, 2006)

“Learning & Idea Capturing” KM technique;

“A key aspect of knowledge management (KM), at the personal and team levels, is to more 'collectively and systematically' capture the learning and ideas that are taking place. Learning and idea capture is a guide on how to do this.” (Raymund Sison, 2006)

“After Action Review” KM technique;

“After Action Review (AAR) is a technique to evaluate and capture lessons learned upon completion of a project. It allows project team members to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses”. (Raymund Sison, 2006)

“Blogs” KM technique;

“A Blog is a very simple 'journal style' website that contains a list of entries, usually in reverse chronological order. The entries are typically short articles or stories, often relating to current events.” (Raymund Sison, 2006)

CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

Method used to achieve the objectives is comprehensively described in this research methodology chapter. The graphical representation of the research methodology is mentioned below.

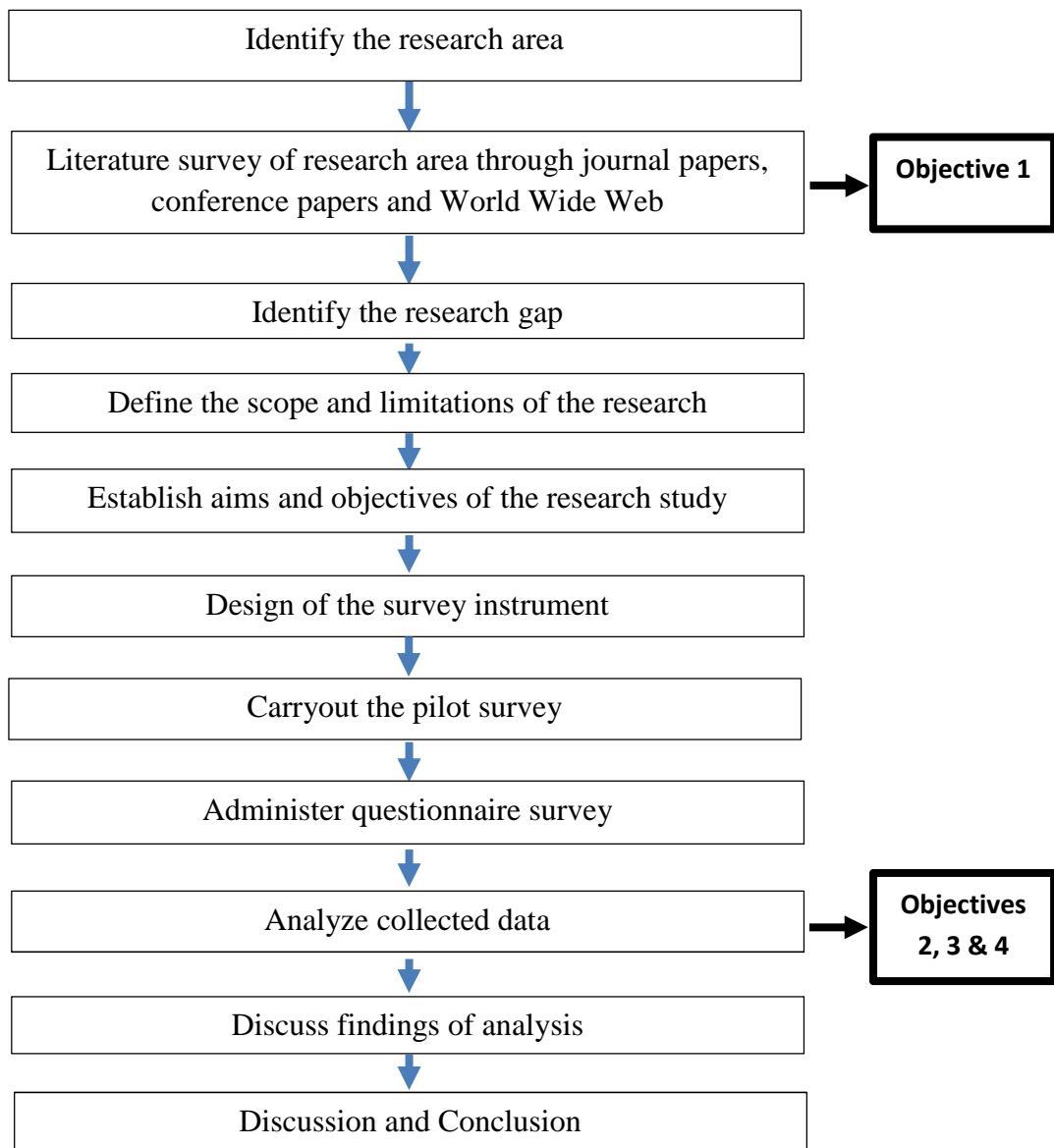


Figure 3.1: Research Methodology

First identified the research area and start the literature study. Then identify the research gap and identified the research problem. After identifying the research problem, the aims and objectives of the research study was developed. There after the research scope and limitations were identified. The literature survey was carried out thereafter where knowledge management, project management related knowledge management was studied using text books, articles and World Wide Web. Thereafter the research parameters were identified. Based on the research parameters required to measure the questionnaire survey was designed. The questionnaire was given to the persons who were in the group.

After the data collection it was fed into a excel sheet where it was to analyzed. Based on the data analysis the objectives were fulfilled and findings of this research elaborated in the relevant chapters.

3.1 Literature Survey

The information on IT project management and Knowledge management was gathered through literature survey. Knowledge management related to IT project management was based on this literature survey. Basically, books, articles, and World Wide Web were used during the literature survey.

3.2 Questionnaire Survey

A Questionnaire survey was designed to achieve the main objectives of the project. The questionnaire was prepared provided to three people to verify the questionnaire contents. Based on their feedback I amended the questionnaire. Thereafter I gave the questioner to one project manager to check whether it is understandable by them or any more details required and clearance of the questions.

The sample of the research was selected based on the projects completed very recently and ongoing IT projects. The selected project managers and system architects who were linked to ongoing and nearly completed IT projects.

The one of the main objective of this research is to identify the methodologies used for KM in IT project implementation, where standard KM methodologies were listed against each stage of the project. This was done for easy data collection, where all methodologies identified through the literature review was used. Separate area was also allocated to capture new methodologies used by the interviewers. Further the effectiveness of this KM methodology was recorded. For each stage of the project there was several knowledge management methodologies used. The interview questionnaire gathered the above.

The other objective was to identify the challenges in Knowledge management in IT project implementation. The common challenges in IT project management were listed in the interview questionnaire and any other challenge experienced by the project managers or architect, Provision was provided to capture such information. In order to identify the mostly faced challenge in implementing knowledge management in IT project implementation, the interviewer was requested to rank the challenge. It is provided to capture the action taken to overcome such a challenge.

The interviewers experience was captured related with the IT project implementation in telecom industry as well as none telecom industry. Additionally particular project details was captured such as the project start the interview involvement, project scope, etc. Such information captured by questionnaire was analyzed based on the type of the project and success of the knowledge management.

3.3 Data Collection

It was decided to get the data by interviewing 25 project managers and project architects. All the project managers and project architects were selected from telecom industry. I have selected project managers and project architects who handled projects with Sri Lanka Telecom. Some respondents were from Sri Lanka Telecom and some were from vendors/ partners who were involved with SLT project. There were some cases where part of the project was handled by one project manager and the rest of the stages were handled by another project manager. In such a cases both project managers were interviewed to get the input for all stages of the project. The projects which were

considered in the research were at different stages of completeness. Some projects were ongoing at the time of data collection and some projects were recently completed. When considering the selected projects I consider only the projects which were completed in recent past. Only the SLT project managers were interviewed where the project managers of venders could not be contacted.

The Questionnaire were filled personally interviewing them or talking to them through phone, Sometimes email was used to gather the filled up Questionnaires. The questionnaire is attached in annexure 2 in this report.

3.4 Data Analysis Methods used in the Study

For the data analysis Microsoft Excel is use as an IT tool where all the collected data were inserted to the MS Excel. Based on that data enter to the excel sheet, different graphs generated. Some cases bar charts used and some cases pie charts used.

All the calculations done using the excel tool. Some sections simple percentage value calculated and some case weighted average calculated.

CHAPTER 4

DATA ANALYSIS

4.0 Introduction

Data gathered through the questionnaire survey was analyzed in this chapter. This chapter further explains how data was collected specially the detail of the data sample. Data was quantitatively analyzed by using the graphical representation to support the final outcome.

4.1 Data Sample

The data was collected from 25 people after interviewing them. They were from different telecom industry IT projects. Some projects were completed recently and some projects were still being done at different stages. Their involvement in the projects is illustrated as in the Figure 4.1 below.

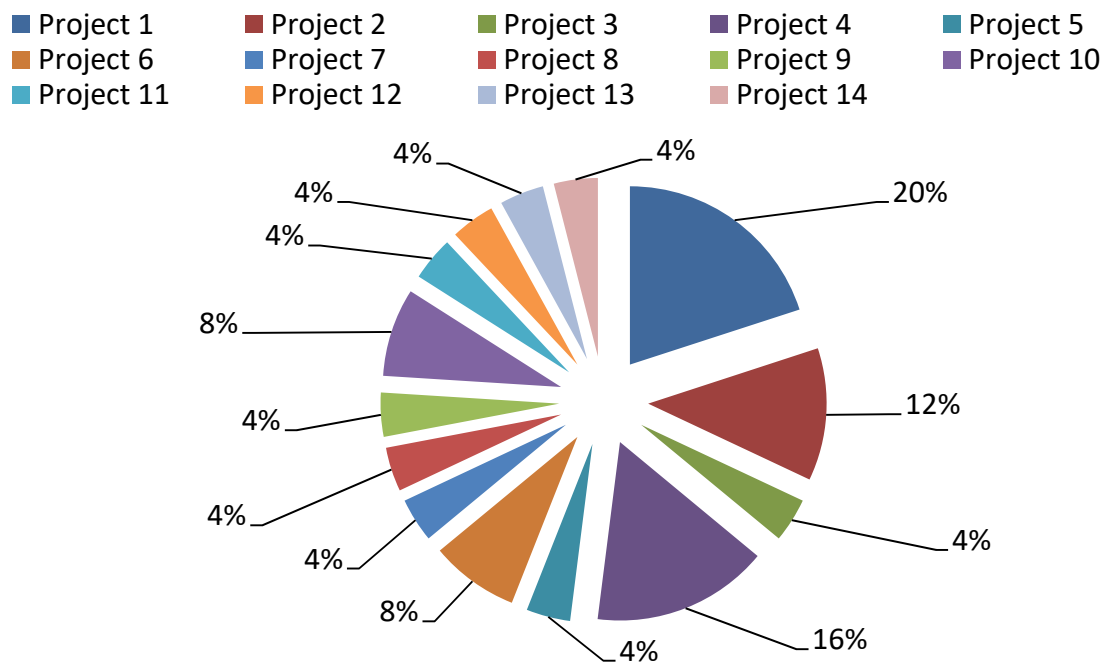


Figure 4.1: Percentage of number of respondents from different projects

The project phases distribution with respect to the phases they were in is illustrated in table 4.1.

Table 4.1: Summary of project phases

Phase	No. of projects	Percentage (%)
Designing	3	21.43
Implementation	4	28.57
Testing	1	07.14
Completed	6	42.86
Total	14	100

The graphical illustration of the project phase shown in Figure 4.2 below.

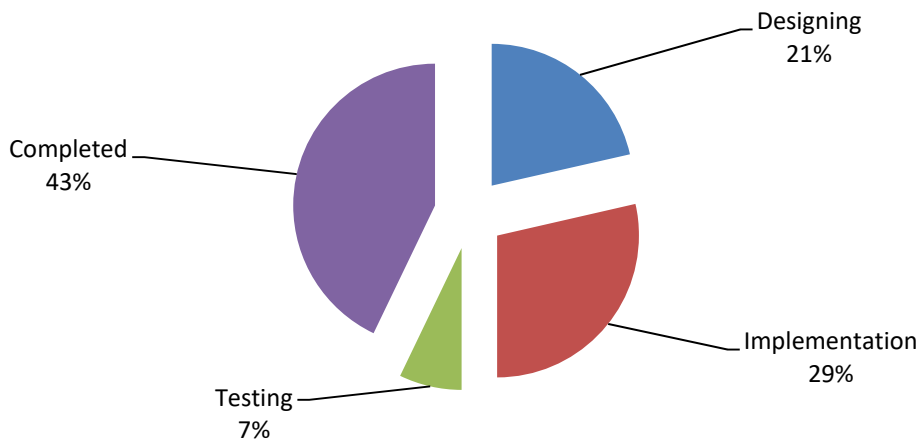


Figure 4.2: Status of the project

When considering the role of the person interviewed the results are shown in the following table 4.2.

Table 4.2: Role of the person in respective projects

Role of the person	Number of respondents
Project Managers	21
Program Managers	1
System Architects	3
Total	25

As per the table 4.2 the sample was mostly from project managers.

4.2 Data Analysis

When considering the project knowledge management points of view, following details were gathered to identify whether the knowledge manager's role identified in the respective projects. The Table 4.3 shows the required details.

Table 4.3: Summary of Knowledge Manger's role identified in respective projects

	No. of Persons	Percentage (%)
KM role Identified	11	44
KM role not Identified	14	56
Total	25	100

As per the above results 56% of the project personals agreed that the "project knowledge manager" role was not identified in their projects. In some cases where SLT project teams identified the "project knowledge manager" role but from SI (System Integrator) side it was not identified. The results are graphically presented in Figure 4.3.

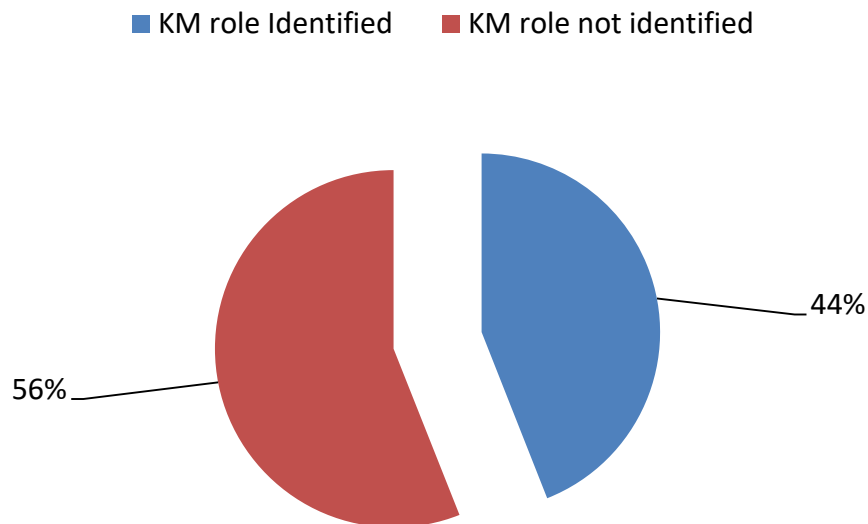


Figure 4.3: "Knowledge Manager" Role Identified in respective projects

4.2.1 Knowledge Management methodologies used for the projects at “Planning” phase

The Table 4.4 shows the summary of knowledge management methods used at planning phase of the projects.

Table 4.4: Knowledge management methodology use at the “planning” phase of the projects

KM Methodology	Percentage (%) used
After action review	6.82
Brainstorming	45.45
Learning & Idea Capturing	36.36
Refer Knowledge Bases	11.36
Total	100.00

The highest number of responses used “Brainstorming” knowledge management methodology in project planning phase. The second highest use knowledge management methodology is the “Learning & Idea Capturing” for planning phase projects. The third highest use knowledge management methodology is the “Reference Knowledge Base” method. When considering the effectiveness of those three knowledge management methodologies, there was no much of a difference in the effectiveness in first two methodologies as per the respondents. “Brainstorming” methodology got highest effectiveness followed by “Learning & Idea Capturing” and “Reference Knowledge Base”.

The following Figure 4.4 graphically illustrates the knowledge management methods used in the project planning phase.

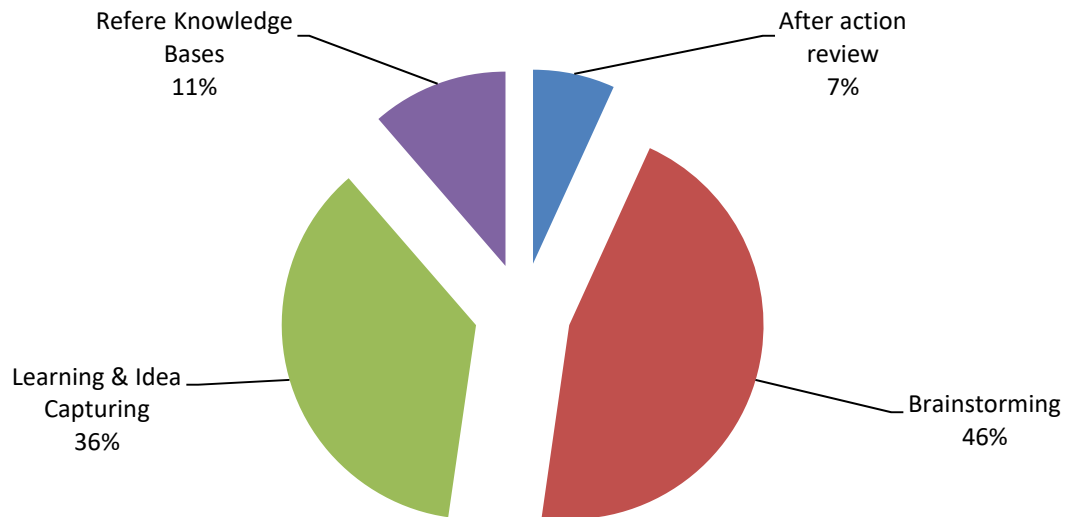


Figure 4.4: Knowledge Management Methods used in “Planning” phase

4.2.2 Knowledge management methodologies used for the projects at the “Design” phase

The Table 4.5 shows the summary of knowledge management methods used at the Designing phase of the projects.

Table 4.5: Knowledge Management methods use at “Designing” phase of the projects

KM Methodology	Percentage used (%)
After action review	10.81
Blogs	5.41
Brainstorming	27.03
Learning & Idea Capturing	35.14
Refer Knowledge Bases	21.62
Total	100.00

The highest number of responses used “Learning & Idea capturing” knowledge management methodology in project designing phase. The second highest knowledge management methodology was “Brainstorming” at the designing phase of the projects. The third highest was the “Reference knowledge base” method.

Following Figure 4.5 graphical illustrates results.

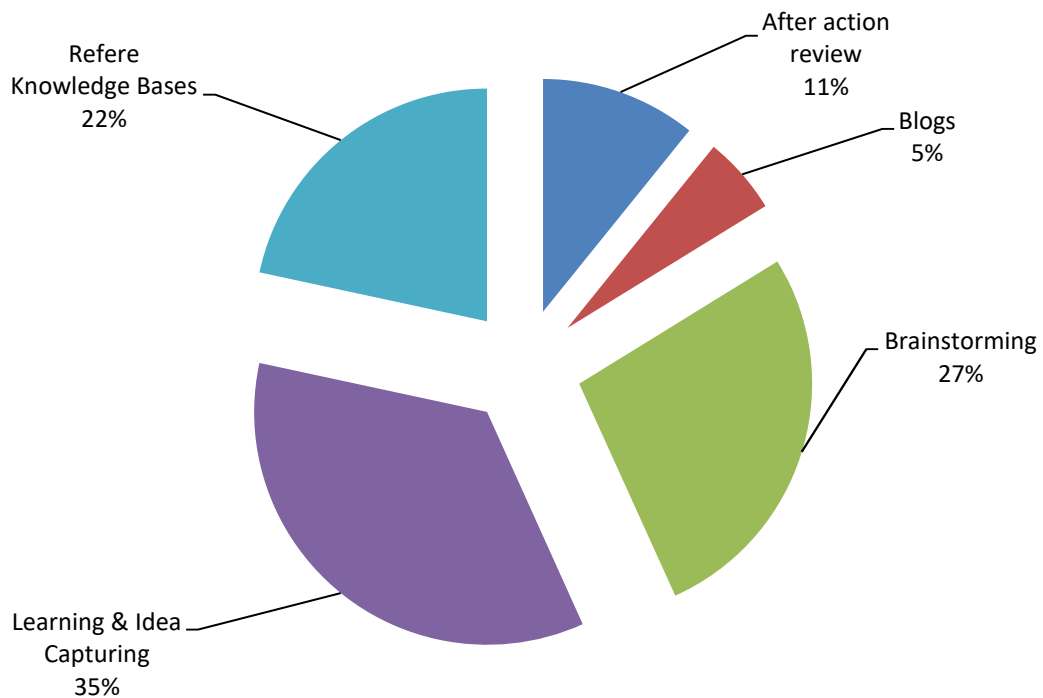


Figure 4.5: Knowledge Management methods used in project designing phase

The opinion on the effectiveness of each knowledge management methodology used at designing phase is reported Table 4.6. Weighted average method (RII) was used for the calculation. Weightage 5 was given for the most effective method and weightage 1 was given to the least effective method.

Table 4.6: Effectiveness of knowledge management method used at
“Designing” phase

KM Methodology	Weight average calculated for effectiveness (RII)
After action review	3.5
Blogs	3.5
Brainstorming	4.6
Learning & Idea Capturing	4.4
Refer Knowledge Bases	4.4

When considering the effectiveness of the five knowledge management methodologies, there isn't much difference in effectiveness as per the respondents. “Brainstorming” methodology got highest effectiveness and then “Learning & Idea Capturing” then “Reference Knowledge Base”.

4.2.3 Knowledge Management methodologies used for the projects at “Implementation” phase

The Table 4.7 shows the summary of knowledge management methods use at “Implementation” phase of the projects.

Table 4.7: Knowledge Management methods used at “Implementation” phase
of the projects

KM Methodology	Percentage used (%)
After action review	17.39
Brainstorming	13.04
Learning & Idea Capturing	21.74
Reference Knowledge Bases	47.83
Total	100.00

When consider the knowledge management methodologies used by the project managers for the projects at implementation phase, “Reference knowledge bases” was the methods used by most projects. Where it contents 47.82% of all other project knowledge management methodologies. In other words almost half of the projects at implementation stage used the “Reference knowledge base” knowledge management methodology. The second mostly used knowledge management methodology was the “learning & idea capturing” knowledge management methodology. Where 21% of response in implementation phase projects used this methodology.

Following Figure 4.6 shows the graphical illustration of knowledge management methods used in project Implementation phase.

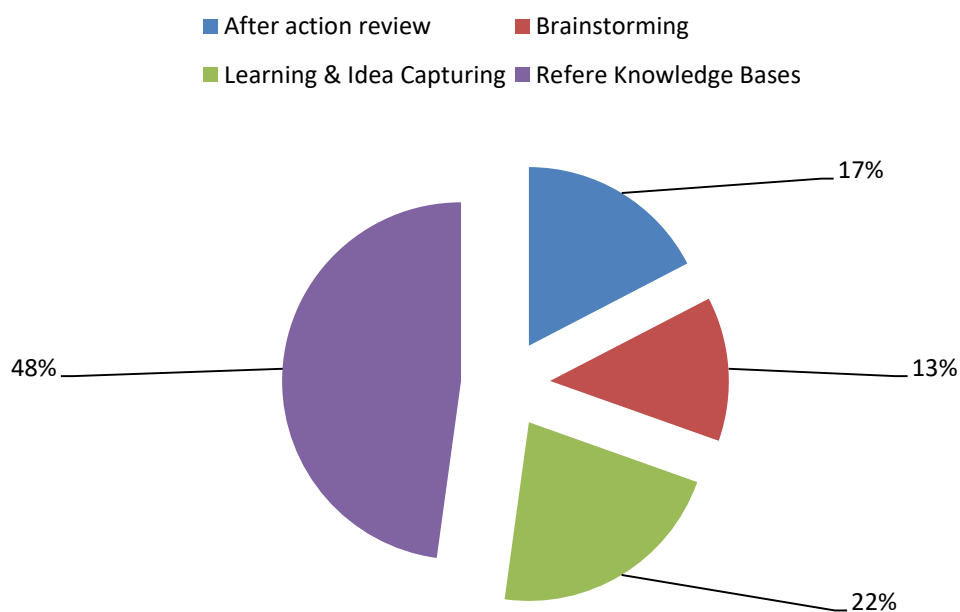


Figure 4.6: Knowledge Management methods used in projects “Implementation” phase

The effectiveness of each knowledge management methodology measured. The following Table 4.8 shows the response of the effectiveness of the knowledge management method used in implementation phase.

Table 4.8: Effectiveness of knowledge management method used at
“Implementation” phase

KM Methodology	Weighted average calculated for effectiveness (RII)
After action review	3.75
Brainstorming	4.67
Learning & Idea Capturing	4.20
Reference Knowledge Bases	4.09

When considering the effectiveness of this knowledge management methodology, the most effective knowledge management methodology as per the response was “Brainstorming” methodology. But when considering the second effective knowledge management methodology was the “Learning & Idea Capturing” methodology. The effectiveness among the first three methodologies does not have significant variation and the highest used knowledge management methodology “Reference Knowledge Bases” shows the effectiveness of 4.09.

4.2.4 Knowledge Management methodologies use for the project “Testing” phase

The Table 4.9 shows the summary of knowledge management methods used at “Testing” phase of the projects.

Table 4.9: Knowledge Management methods used at “Testing” phase of the projects

KM Methodology	Percentage Used (%)
After action review	42.86
Brainstorming	21.43
Learning & Idea Capturing	14.29
Refer Knowledge Bases	21.43
Total	100.00

The highest number of respondents used “After action review” knowledge management methodology in project testing phase. The second highest use knowledge management methodologies was the “Brainstorming” and “Reference Knowledge Bases” for testing phase of the projects.

Following Figure 4.7 shows the graphical illustration of knowledge management methods used in project testing phase.

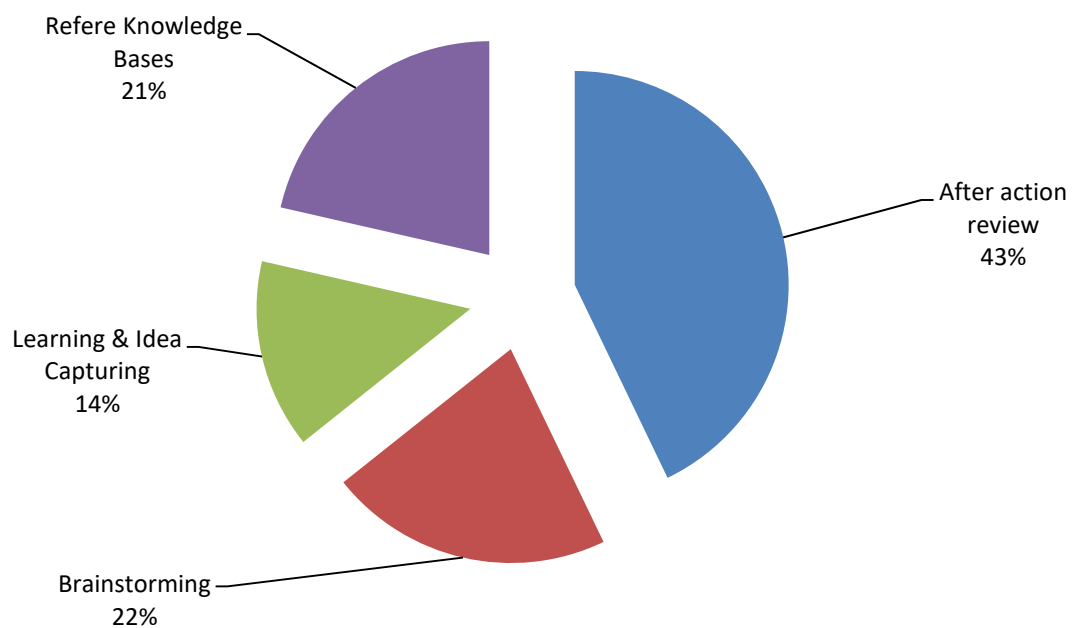


Figure 4.7: Knowledge Management methods used in projects testing phase

The effectiveness of each knowledge management methodology measured. The following Table 4.10 shows the response of the effectiveness of the knowledge management method used in testing phase.

Table 4.10: Effectiveness of knowledge management method used at “Testing” phase

KM Methodology	Weighted average calculated for effectiveness (RII)
After action review	4.50
Brainstorming	4.67
Learning & Idea Capturing	4.50
Refer Knowledge Bases	4.33

When consider the effectiveness of those three knowledge management methodologies, there isn't much difference in effectiveness as per the users. Where “Brainstorming” methodology got highest effectiveness and then “Learning & Idea Capturing” and “After action review” knowledge management methodologies. Also it observes that highest effective method doesn't become the most use knowledge management methodology. This may due to the effectiveness does not have significant difference among the top three use knowledge management methodologies in “testing” phase of the projects.

4.2.5 Knowledge Management methodologies used for the projects at “Completed” phase

The Table 4.11 shows the summary of knowledge management methods used at “Completed” phase of the projects.

Table 4.11: Knowledge Management methods used at “Completed” phase of the projects

KM Methodology	Percentage used (%)
After action review	30
Blogs	10
Brainstorming	10
Learning & Idea Capturing	30
Refer Knowledge Bases	20
Total	100

In the project “Completed” phase the mostly used knowledge management methodology is the “Learning & Idea capturing” methodology and “After action review” methodology. Where both methodologies got same percentage of used. The next highest used knowledge management methodology is the “Refer Knowledge Base” methodology.

Following Figure 4.8 shows the graphical illustration of knowledge management methods used in project “completed” phase.

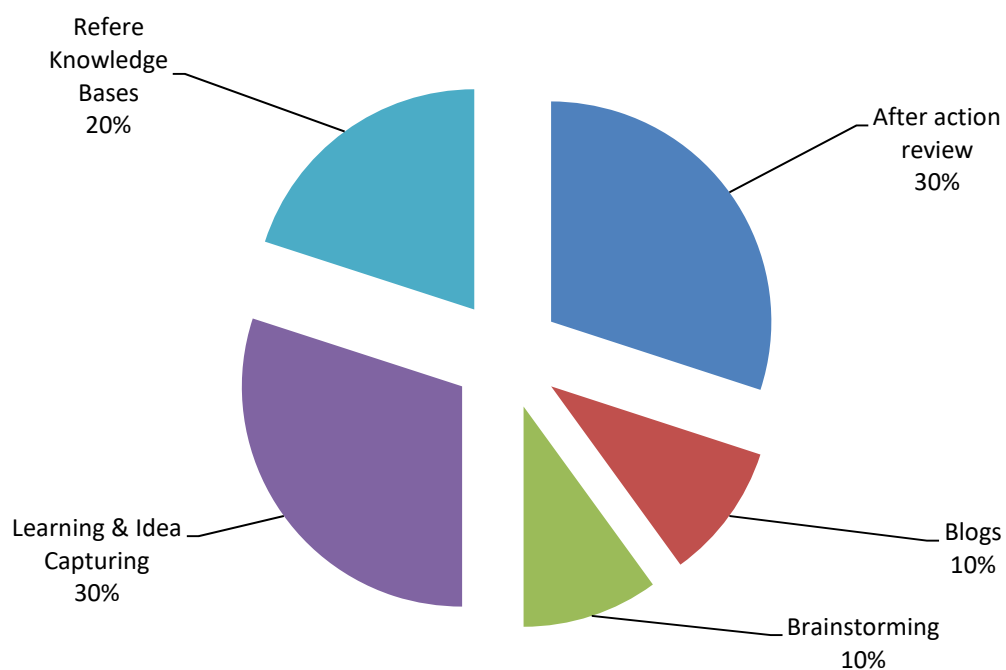


Figure 4.8: Knowledge Management methods used in projects “Completed” phase

The effectiveness of each knowledge management methodology measured. The following Table 4.12 shows the response of the effectiveness of the knowledge management method used in completed phase.

Table 4.12: Effectiveness of knowledge management method used at “Completed” phase

KM Methodology	Weighted average calculated for effectiveness (RII)
After action review	4.67
Blogs	2.00
Brainstorming	5.00
Learning & Idea Capturing	4.00
Refer Knowledge Bases	4.50

When consider the effectiveness of the knowledge management methodology, “After action review”, “Learning & Idea Capturing” and “Refer Knowledge Base” got similar effectiveness. That means there is no significant variation of effectiveness of the knowledge management methodology used in “Completed” phase of the project.

The first objective of the research work was to identify the knowledge management methodologies applied in project management. Where this objective was achieved with respective of each phases, such as planning phase, designing phase, etc.

When considering the most effective knowledge management methodology again it varies with the project status. Some KM methods mostly effective for one phase of the project but not effective for other phase. The below Table 4.13 shows the most effective knowledge management methodology used in different phase of the projects.

Table 4.13: Effectiveness of the knowledge management methods in different life cycle phases of the project

Life Cycle phase of the project	Most Effective KM method	2nd Most Effective KM method	3rd Most Effective KM method
Planning	Brainstorming	Learning & Idea Capturing	Refer Knowledge Bases
Designing	Brainstorming	Learning & Idea Capturing	Refer Knowledge Bases
Implementation	Brainstorming	Learning & Idea Capturing	Refer Knowledge Bases
Testing	Brainstorming	Learning & Idea Capturing	After Action Review
Completed	Brainstorming	After Action Review	Refer Knowledge Bases

As per the above results the most effective knowledge management methodology was the “Brainstorming” methodology. Where it be used for any stage of the project. The second most effective knowledge management methodology was the “Learning & Idea Capturing” methodology.

4.2.6 Challenges in implementing knowledge management

When considering challenges of identified in implementation of knowledge management methodologies, the most of the respondents mentioned that “Project duration is short, hence applying KM is difficult” is the most identified challenge. Where it got the average rank of 1.44. The next most identified challenge is the “Difficult to tap the experience person knowledge”. Where it got average rank as 2.24. The above two challenges are the reasons where most of the responders identify as main challenge in implementing the knowledge management system.

Table 4.14: Summary of Challenges in Implementing Knowledge Management

Challenges in KM	Weighted Average Rank
Difficult to tap the experience person knowledge	2.24
More focused on project deliverable	3.48
Project duration is short, hence applying KM is difficult	1.44
Team members are fixed only for the project and after the project they move to different division	2.84

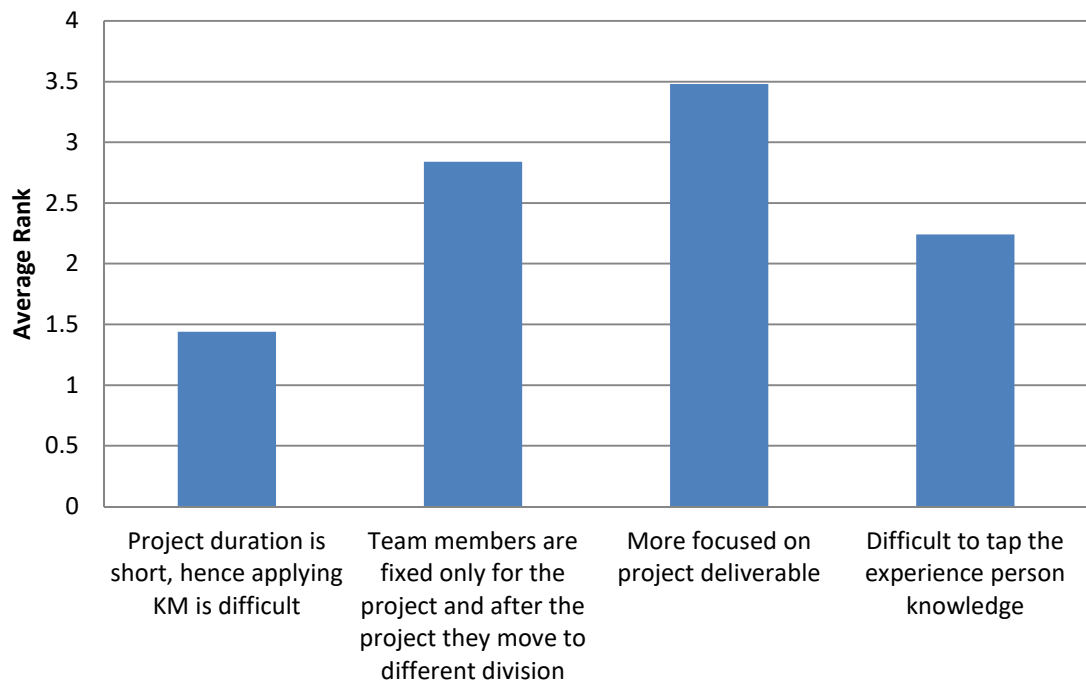


Figure 4.9: Weighted average calculated based on the severity of the identified 4 challenges in implementing the Knowledge Management

Most observe challenge rank as 1 and least observed challenge rank as 4.

Based on the outcome of the research it was identified that the main challenge in knowledge management in IT related project is the “Project duration is short and hence

applying KM is difficult”. Most of the IT related projects are completed within few months. Such as version upgrade of an IT application project complete within two or three months. Only IT projects such as CRM/ERP take over one year. Hence for short period projects it is difficult to apply the KM methodologies as per the outcome of this research. So next challenge in KM in IT project implementation is the “Difficult to tap the experience person knowledge”. This is again related with the previous challenge. Where in IT projects the duration of the project is short. Hence to document the experience person knowledge within short period is difficult. Mostly it is given low priority in IT projects to maintain lesson learn logs. Where more focus is being given to complete the project in given time period. Where most of the projects implementation partners are from foreign countries. Due to the cost of the implementation they try to finish the project in shorter period. The next challenge in IT project implementation is “Team members are fixed only for the project and after the project they move to different divisions”. Where project organization is for temporary basis. Hence the interest on document the knowledge gathered during the project is less. Therefore it is difficult to maintain the knowledge in IT project management. The least identified challenge in KM in IT project management is “More focused on project deliverable”.

4.2.7 Areas need to improve the KM practice in IT project management

As per the data gathered from the sample, it is observed that the “Project Knowledge Manager” role is not identified in many projects. This role has to be defined.

The other indicates the need to identify lesson learnt and properly document them. In the long run project sponsor need to take this responsibility as organizational responsibility.

Usually the lesson learn logs are not maintained properly. The management or project monitoring division can start a competition among project managers who are carrying out IT projects to maintain proper documentation within project organization. Similarly organizational procedures can be established when handing over a project

“Lesson learn log” is a mandatory document to complete and handover to project management office. So project managers can submit such document and organization can encourage the project managers to document their experience at the end of the project.

The other thing is that the organization can maintain details of project members who worked as project members for IT projects. When similar project going to start, project management office can assign such person for the project as project members. So the project member knowledge on previous completed similar projects will reuse.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes the analytical findings of the research work and proposed some recommendations related to the findings. The findings related with the objectives of the research work is further discussed in this chapter.

5.2 Findings from the Research

At the beginning of the study four objectives were defined. All four objectives were achieved during this project.

The first objective was “Identify the methodologies used for KM in IT project implementation”. Where this was achieved during the literature review stage of the project. Several KM methodologies were identified during this stage.

The second objective was “Rank methodologies to identify the most successful KM methodology”.

The most used knowledge management method varies from one stage of the project to another phase of the project. There are several KM methodologies used for IT project implementations such as “Brainstorming”, “After Action Review”, “Learning & Idea Capturing”, “Refer Knowledge Bases” and “Blogs”.

When considering the most effective knowledge management methodology throughout all the phases of the project is the “Brainstorming” method. The second most effective knowledge management method is the “Learning & Idea Capturing”.

The third objective was “Identify the challenges in implementation of KM in IT project implementation”.

When considering the challenges in implementing the knowledge management in IT project management, the main challenge is the “Difficult to tap the experience personal knowledge”. This finding is in line with the literature review as well. The second mostly believed challenge in implementing knowledge management is the “More focused on project deliverable”.

The fourth objective was “Identify the area that needs to improve the KM practice in IT project management”. Where one area was to consider role of a “Knowledge Manager”. Only 44% of the key project personnel identified that the “Knowledge Manager” role needs to be establish in IT projects. Hence the IT project management, to identify the KM as a main part of the project and employ a person for carryout such role. Next area to be improved is the “taping the experience and document” it. This reinforces the need to document the lessons learnt logs after each phase of the project.

5.3 Recommendations from Findings

When considering the “Knowledge Manager” role identification of the IT projects it is in poor status where only 44% of the project managers identify the “Knowledge Manager” role in their respective projects. It is below the 50% threshold and this is not a good sign with respective to the knowledge management point of view. So it is recommended to improve this status where each IT project organization needs to identify the role of a project knowledge manager. In order to improve this it is recommended to educate the project managers at the beginning of the project about the project knowledge management and how important it for the future. Especially project sponsors should be aware the benefits of project knowledge management to the organization. The organization should take immediate actions to appoint project knowledge managers to fill the existing gap, since most projects that are implemented does not have a knowledge manager.

5.4 Future Research

It is recommended that the same project management research to be carried out with other telecom company IT project implementations, such as Mobitel, Dialog, etc. There by allowing a comparison. It is further recommended to extend the research to other service sector IT project implementation projects.

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Interview Questions from Project Manager/ Architecture

1.0 General Details

1.1 Name:

1.2 Designation:.....

1.3 Organization:

2.0 Project Details

2.1 Name of the project:
.....

2.2 Project duration (estimated duration if ongoing project):

2.3 Present stage of the project:

2.4 Project start date:

2.5 Scope of the project:
.....
.....
.....
.....

2.6 Main project objectives of the project:
.....
.....
.....
.....

2.7 your role in this project:

.....

2.8 The size of the core project team:

2.9 Number of qualified project professionals in the project team:

2.10 Knowledge manager role identified within the project organization: (Yes/No)

3.0 Knowledge management methodologies applied in each stage

S/No.	Project stage	Knowledge management methodology applied	Effectiveness of the KM methodology
1	<input type="radio"/> Plainning <input type="radio"/> Design <input type="radio"/> Build <input type="radio"/> Test <input type="radio"/> Launch	<input type="radio"/> Brainstorming <input type="radio"/> Learning & Idea Capturing <input type="radio"/> After action review <input type="radio"/> Refere Knowledge Bases <input type="radio"/> Blogs	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> No Effect <input type="radio"/> Low <input type="radio"/> Very Low
2	<input type="radio"/> Plainning <input type="radio"/> Design <input type="radio"/> Build <input type="radio"/> Test <input type="radio"/> Launch	<input type="radio"/> Brainstorming <input type="radio"/> Learning & Idea Capturing <input type="radio"/> After action review <input type="radio"/> Refere Knowledge Bases <input type="radio"/> Blogs	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> No Effect <input type="radio"/> Low <input type="radio"/> Very Low

3	<input type="radio"/> Plainning <input type="radio"/> Design <input type="radio"/> Build <input type="radio"/> Test <input type="radio"/> Launch	<input type="radio"/> Brainstorming <input type="radio"/> Learning & Idea Capturing <input type="radio"/> After action review <input type="radio"/> Refere Knowledge Bases <input type="radio"/> Blogs	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> No Effect <input type="radio"/> Low <input type="radio"/> Very Low
4	<input type="radio"/> Plainning <input type="radio"/> Design <input type="radio"/> Build <input type="radio"/> Test <input type="radio"/> Launch	<input type="radio"/> Brainstorming <input type="radio"/> Learning & Idea Capturing <input type="radio"/> After action review <input type="radio"/> Refere Knowledge Bases <input type="radio"/> Blogs	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> No Effect <input type="radio"/> Low <input type="radio"/> Very Low
5	<input type="radio"/> Plainning <input type="radio"/> Design <input type="radio"/> Build <input type="radio"/> Test <input type="radio"/> Launch	<input type="radio"/> Brainstorming <input type="radio"/> Learning & Idea Capturing <input type="radio"/> After action review <input type="radio"/> Refere Knowledge Bases <input type="radio"/> Blogs	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> No Effect <input type="radio"/> Low <input type="radio"/> Very Low
6	<input type="radio"/> Plainning <input type="radio"/> Design <input type="radio"/> Build <input type="radio"/> Test <input type="radio"/> Launch	<input type="radio"/> Brainstorming <input type="radio"/> Learning & Idea Capturing <input type="radio"/> After action review <input type="radio"/> Refere Knowledge Bases <input type="radio"/> Blogs	<input type="radio"/> Very High <input type="radio"/> High <input type="radio"/> No Effect <input type="radio"/> Low <input type="radio"/> Very Low

Any other knowledge management methodology applied: focused

.....

4.0 Challenges faced in applying the knowledge management methodologies

Most observe challenge rank as 1 and least observe challenge rank as 4.

S/No	Challenges faced in applying the KM	Rank of the challenge			
1	<input type="radio"/> Project duration is short hence applying KM is difficult	1	2	3	4
2	<input type="radio"/> Team members are fixed only for the project and after the project they move to different division	1	2	3	4
3	<input checked="" type="radio"/> More focused on project deliverables	1	2	3	4
4	<input type="radio"/> Difficult to tap the experience person knowledge	1	2	3	4

5.0 Details of work / project experience

5.1 Work experience in telecommunication Industry:

5.2 Experience in years in IT project implementation:

5.3 Details of other IT projects (main) involved:

S/No	Name of the IT project	Present project status (Ongoing/ completed)	Project job role
1			
2			
3			
4			

5.3 Experience (in years) in IT project implementation in same project job role:

5.4 Experience in years in other projects: