

Project risk management role in reducing failure of information technology projects

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It all starts here TM



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DECLARATION

I Roseline Mamkhowa Bocibo, declare that

Project risk management role in reducing failure of information technology projects

is my own work, and that all the sources used or cited have been identified and acknowledged by means of complete reference.

The work has been done under the guidance of Prof Philip (PD) Pretorius and Dr Daan (HJ) de Villiers at the North-West University (Vaal Triangle Campus).

Signature:

Date:

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ABSTRACT

The purpose of this study is to understand the role of project risk management to reduce failure in information technology projects.

In order to accomplish the purpose of the study the research questions were developed to determine the objectives of the study. Research methodology was discussed in general and the researcher chose the research methodology that was suitable for the study. The research methodology that was chosen for the study was used as a guideline for the researcher. Based on the title of the study the literature review was developed to understand project management and the role of project risk management to reduce failure of Information Technology projects, the causes of Information Technology projects failure was discussed.

The methodology research design part of the study involved quantitative methods, to gather data that elaborated more on the role of project risk management to reduce Information Technology project failure. The data collected was evaluated according to the responses from the participants and Pareto Analysis (80/20) principle. The data collection methods used are interview and survey that included questions about risk management and Information Technology project failure, observation to check the way participants responds during the interview. The results were used to make recommendations for the study and Pareto analysis was used to determine the support of participants from largest to lowest.

Data collected limited the study to focus on Project Management knowledge area which is Project Risk Management, due to time and funding. The recommendations were made to improve on how Information Technology projects failure can be reduced.

Key words: Information Technology, Project Management, Project, Project Risk Management Process and Risk Management.

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CHAPTER 1: INTRODUCTION AND PROBLEM STATEMENT

Figure 1.1 below demonstrates the flow of the chapters involved in the study and it provides a summary of discussion of each chapter.

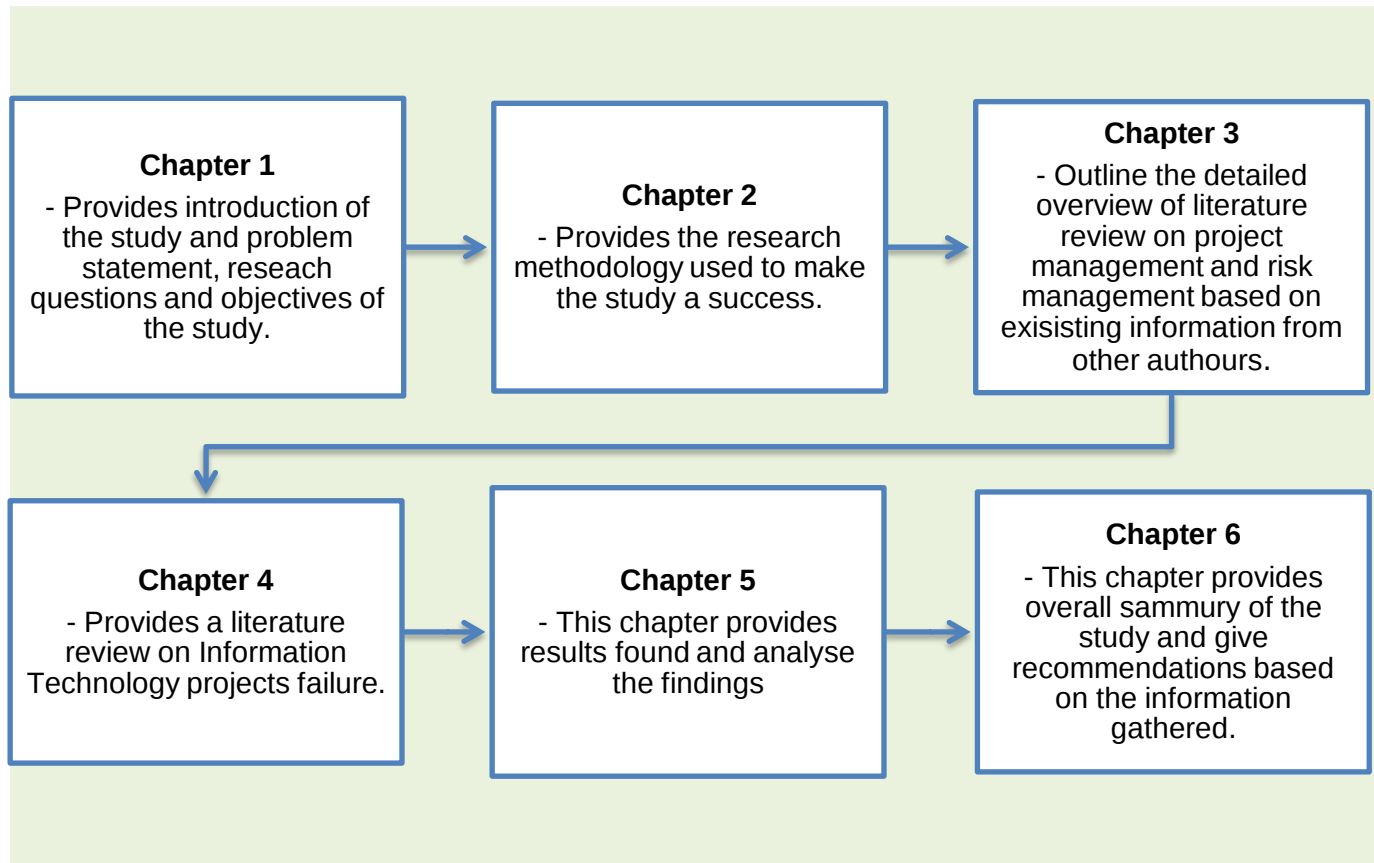


Figure 1.1: Summary of study chapters

This study aimed to determine the role of project risk management in project management in order to assist in reducing failure of Information Technology (IT) projects. The goal of this chapter is to provide the (1.1) Introduction; (1.2) Background of the study; (1.3) Statement of the problem; (1.4) Research questions of the study; (1.5) Research objectives of the study; (1.6) Research methodology; (1.7) Layout of the study; (1.8) and finally, the conclusion of the chapter.

1.1 INTRODUCTION

This section provides an understanding of the role of project risk management in reducing Information Technology (IT) project failure. It is very important to provide the meaning of project failure in general. Diana (2010) states that to determine whether a project is a failure or a success is not a simple exercise. She further defines project failure as a project that does not meet the scope, schedule, budget, risk, resources and quality of the business. Dorsey (2005:1) states that the statistics rate of information technology projects failure is between 50% and 80%, the rate would have been higher if the people did not hide the bad news about IT projects failure.

Standish Group (2004) states that IT improvement projects can be classified into three collections, namely, successful, challenged, and reduced. Projects that are delivered on time, within the scope of the business and within the budget are called successful. Projects that are completed over budget, and have less functionality are called challenged, and lastly projects that are cancelled or terminated are called impaired. Cost, quality, speed and risk are four interdependent factors for success of a project, risk and quality are the most important ones (Dorsey, 2005:4). The information motivated the researcher to focus on project risk management as an interdependent factor to reduce IT projects failure.

1.2 BACKGROUND TO THE STUDY

1.2.1 Project management

A project is defined as a process of building a complex artefact that has to be started on a specific date and completed on a specific date, within budget, making use of relevant resources and it requires performance in order to meet customer's requirements (Attarzadeh and Ow, 2008: 234). According to Bakouros and Kelessidis (2000) project management is the way in which capabilities, understanding and procedures are applied together to produce projects in a professional and successful way. Kemp (2006:4) states that Project Management (PM) is a procedure and actions of preparing, organising, encouraging and monitoring resources to complete required goals.

One can say that project management is the manner in which project managers follow the processes of project management to make sure that people who are working towards the success of the project use appropriate equipment to work on a project in order to complete a goal. Project management is the way in which change is managed (Martin, 2012). Rouse (2008)

states that project management is a way of planning and leading processes of the project from starting day to finish day.

Existing literatures show that 52.7% of projects are not completed on time and as such exceed the budget that it was assigned to them while 31.1% of them did not fulfill their given scope (Attarzadeh and Ow, 2008: 234). Project management plays a very huge role in many companies today as they focus on accomplishing project objectives (Attarzadeh and Ow, 2008: 234). Project management is imperative as it follows the managerial processes and it has tools that provide managers with great opportunity to succeed in achieving the goals of projects (Attarzadeh and Ow, 2008: 234). A project can be managed by a project manager following project management procedures but it can still fail based on success criteria used (Attarzadeh and Ow, 2008: 234).

Attarzadeh and Ow (2008:234) state that Standish Group has established success factors of projects. Clancy (2014:4) states that without the success criteria failure of projects increase gaudily. Table 1.1 below demonstrates project success factors by (Attarzadeh and Ow, 2008:234); (Clancy, 2014:4).

Table 1.1: Project success factors (Attarzadeh and Ow, 2008: 234), (Clancy, 2014:4).

Project Success Factors	%(Percentage) of responses
1. User involvement	15.9%
2. Executive Management Support	13.9%
3. Clear statement of requirements	13.0%
4. Proper planning	9.6%
5. Realistic expectations	8.2%
6. Smaller project milestones	7.7%
7. Competent staff	7.2%
8. Ownership	5.3%
9. Clear vision and objectives	2.9%
10. Hard-working, focused staff	2.4%
11. Other	13.9%

Project management has been used for thousands of years. The management preparation and project management that is used today evolved from World War II and U.S DOD projects (Gentile, 2012:5). According to the definitions of project management provided in paragraph 1.2.1 shows that working on projects require skills and understanding of PM, which will be explained further in chapter 3 of this study.

Project management involves the concept of project risk management to reduce failure within IT projects. Subsection 1.2.2 project risk management outline risk management within project management.

1.2.2 Project Risk Management

Cloete (2009:9) defines risks as consequences that are likely to happen when an incident takes place, with the positive or negative impact involved. Rabechini and de Carvalho (2013: 65) state that since 2008 after financial problems, risk management is a main concern of executives and professionals who work with projects on daily basis. Project risk management is the principle, procedures and structures that organisations use as a direction to determine risk within projects (Department of Treasury and Finance, 2009:3). One can say risk management is a procedure of determining things that can harm projects and provide the solutions for them.

For effectiveness and corresponding risk management within an organisation or project, a risk management framework need to be applied throughout the project (Cloete, 2009:9). A risk management framework helps the project to be checked for risks and makes the risk available for utilisation in decision making process (Cloete, 2009:10). Figure 1.2 below displays the components of a risk management framework.

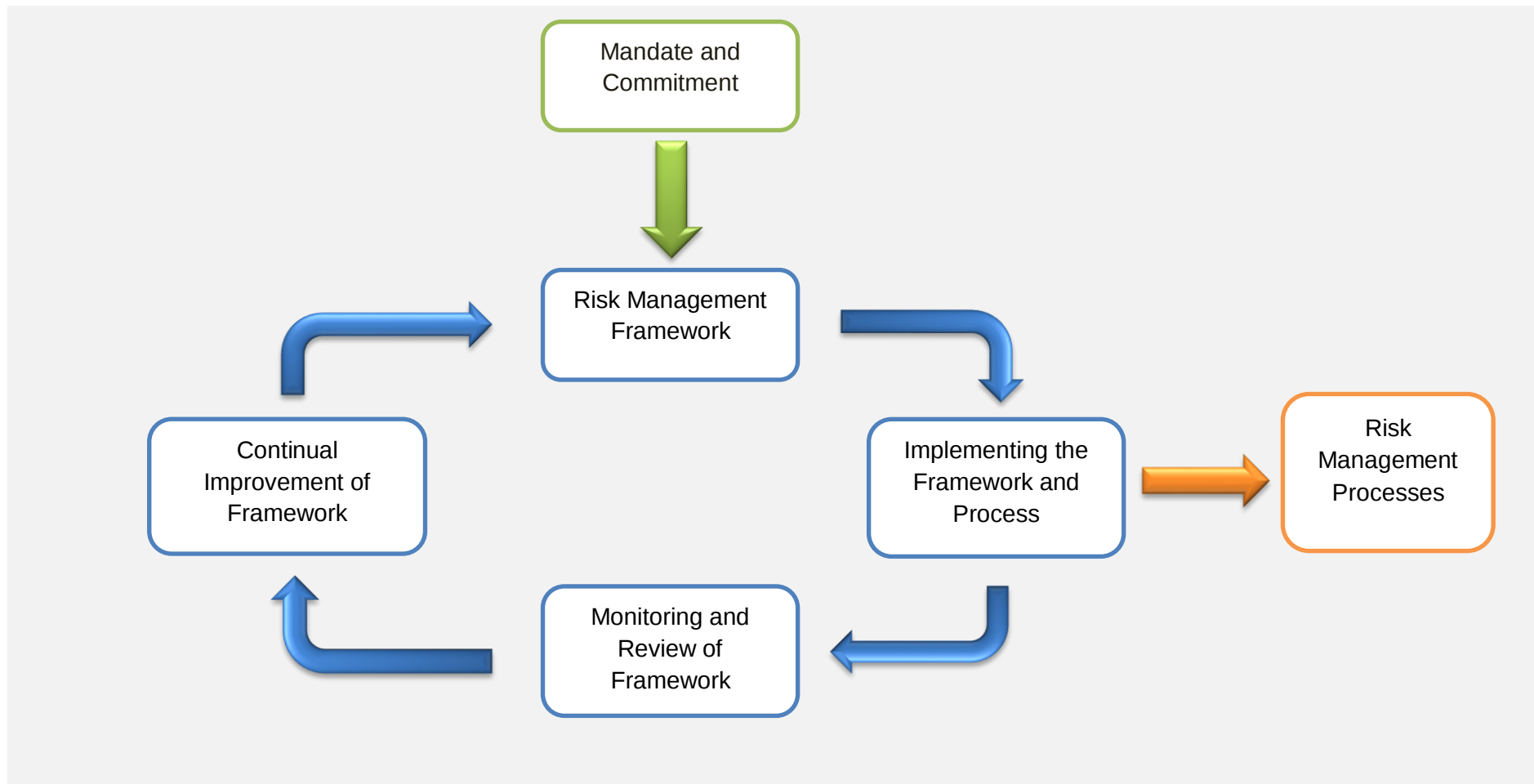


Figure 1.2: Components of the risk management framework, (Cloete, 2009:11).

One can say risk management in projects involves framework in order to ensure that a project succeed and determine risks available on those projects.

Risk management involves the concept of reducing risks in projects, IT projects failure is outlined under the subheading 1.2.3.

1.2.3 Failure in IT projects

Researchers have been trying to find out how IT projects can be managed in order for projects to be successful (Eveleens and Verhoef, 2010:30). Frese and Sauter (2003) state that IT projects have been failing since 1994 and there is a difference between failure and success but there is nothing dividing the two. A project is said to be successful if it has achieved the goals according to their acceptable standards within certain cost and schedule (Barnes, 2012). Project can be said to be successful when it meets the objectives and goals of the business and it is completed on time and it is accepted by the sponsor. A successful project can be well-thought-out as a project that happens to meet the technical performance description and/or purposes set out together with a high level of approval overall of the project result (Agarwal and Rathod, 2006:358).

Mar (2012) states that project failure has been decided to be common by IT professionals and the percentages of project failure ranges from 50% to 80% depending on the definition of the term project failure. Project failure can be defined as follows: Sponsors, participants and stakeholders decides if a project is a success or a failure, meaning a project can be regarded as a failure if stakeholders consider it as a failure. According to Mar (2012) a failed project is a project that does not meet organisation scope, costs and it is not delivered on time. When a project is delivered on time regardless of how much it cost the organisation to complete the project it can be considered a success, meaning project that is delivered late is regarded as failure. One can say that project that does not meet the scope, exceed budget and is delivered with scope being reduced is considered a failure.

Project failure can be checked using various criteria. According to Diana (2010) the scope, schedule, budget, risk, resources and quality can be used to check whether the project is a success or failure. According to Mar (2012) call, delivery to plan, on-time delivery, financial results to match projections and minimum return can be used to determine whether a project is a success or a failure. One can say that many professionals use different ways to define success or a failure of a project.

1.3 STATEMENT OF THE PROBLEM

According to the findings of different authors it has been proven that the rate of information technology projects failure is increasing rapidly and the projects results are classified into different categories which are successful, challenged and failed (Clancy, 2014:3). According to the study conducted by The Standish Group (2013) 39% of information technology projects were successful, 43% were challenged and 18% failed. Given that some of information technology projects are not successful, one can say that not all of IT projects fail.

The research made by businesses state that large IT projects are at high risk of failure than smaller IT projects, (Bloch *et al.*, 2012) McKinsey study showed that 17% of IT projects that costs \$15 million or more didn't go so well and they were frightening the companies and 40% and more of those projects failed. IT projects exceed budget by 45% and 7% over time and they deliver 56% benefits shortfall (Bloch *et al.*, 2012). Gulla (2011) states that information technology projects findings state that 44% of IT projects exceeded the budget and were not handed over on time. Even though there are methodologies and great importance on project management principles IT projects still continue to fail at high rates (Shenhar and Dvir, 2007:93).

Kappelman, *et al* (2007) states that project managers with inadequate skills and knowledge were a major cause of project failure. Projects are growing each and every day and information technology field is growing rapidly. This trend becomes too difficult for project managers to handle large projects within short notice of time. Tesch *et al.*, (2007:61) state that operative project management skills are more imperative to the prosperous outcome of information technology projects than technical skill. The study will illustrate the importance of risk management in project management to reduce failure in information technology projects.

1.4 RESEARCH QUESTIONS OF THE STUDY

Based on the problem statement stated on section 1.3, the following main research question and research sub-questions were suggested for the study. This study mainly focused on the role of project risk management to reduce failure of information technology projects.

1.4.1 Main Research Question

The main research question of this study was: How can risk management in projects reduce failure in information technology projects?

1.4.2 Research sub-questions

The study comprised of the following sub-questions:

- **Question 1:** Why reduce risk in project management?
- **Question 2:** What causes failure in information technology projects?
- **Question 3:** How to determine risk in an information technology project?
- **Question 4:** Why use project management and risk management together?

1.5 OBJECTIVES OF THE STUDY

Based on the problem statement of the study stated on section 1.3, the primary, theoretical and empirical objectives are proposed for the study. The study focused on the role of project risk management to reduce failure in information technology projects.

1.5.1 Primary objective

The primary objective of the study was to understand the role of project risk management to reduce failure in information technology projects.

1.5.2 Theoretical objectives

In order to achieve the primary objective, the following theoretical objectives were formulated for the study:

- **Objective 1:** To gain understanding of project management.
- **Objective 2:** To gain understanding of risk management in project management.
- **Objective 3:** To gain understanding of failure in Information Technology projects.
- **Objective 4:** To gain understanding of risk management by focusing on determining risks in IT projects.

1.5.3 Empirical objectives

In accordance with the primary objective of the study, the following empirical objectives were formulated:

- **Objective 1:** To determine the role of project risk management to reduce failure in IT projects.
- **Objective 2:** To analyse the data gathered from questionnaires to determine the use whether the information will be useful to IT projects.
- **Objective 3:** To determine whether information on reducing IT project failure will play valuable part in future projects that involves IT.
- **Objective 4:** To provide information about how project risk management can be used to reduce failure in IT projects.

1.6 RESEARCH METHODOLOGY

The purpose of this section is to outline the research methodology used for this study and how it has been conducted.

The researcher needs to realise how readers interpret the value of the study according to their paradigms (Oates, 2010:282). A paradigm is an extensive view or viewpoint of something (Taylor *et al.*, 2007). A paradigm tells how research could be affected and directed by particular paradigm by mentioning that paradigms are arrangements of beliefs and practices that need enquiry within the study by providing procedures that the research has accomplished. A detailed methodology is presented in chapter 2.

1.6.1 Research design

Quantitative research is well-defined as the use of arranged questions in which the answer options have been predetermined and the main data is collected from a large number of persons. This type of research is used to test theories or to verify what is expected about a specific field and to examine the natural order by observing the variables (Parasuraman *et al.*, 2007:178). For the goal of the study, a positivism research paradigm was used as the root of the empirical study in order to achieve the research objectives of the study. Descriptive statistics was used to measure inconsistency or distribution of data. The goal of

the study was to determine the role of project risk management to reduce IT projects failure, for this reason descriptive was used to describe and provide the honest and consistent information about data collected from the population.

1.6.2 Questionnaire design

Quantitative research methodology was used on the study as the goal of the study is to measure the results obtained during data collection from the individuals who participated in the study (Malhotra, 2010:171). Quantitative researchers are more concern about emphasising a relationship amongst variables, variances amongst individuals regarding certain variables, and the cause of behaviour (Struwig and Stead, 2004:18). The study include positivism research paradigm which comprises quantitative research methodology approaches for collecting data, which will help the researcher to have solid understanding in the background of the study.

1.6.3 Sampling design

McDaniel and Gates (2010:328) define a sampling plan as the procedure followed to ensure that the gathered data characterises the target population. The target population of this study was as follows:

- The goal of this research was to study post-graduates with respect to their knowledge and experience in project management and IT projects.
- An appropriate sample of no more than 150 people which includes students and people working with IT projects was obtained by sending out questionnaires to the participants.
- Each individual who agrees to participate was asked to read and sign a consent form and promised that their names will be anonymous.

The researcher can use either probability or non-probability sampling to draw up a sample (McDaniel and Gates, 2005:359; Welman *et al.*, 2005:57). According to (Parasuraman *et al.*, 2007:338) probability sampling is a sample practice where every component in the population has a known probability of being incorporated in the sample. The outcomes gained from a probability sample can be generalised to the whole universe or population because it is unbiased (Zikmund and Babin, 2010:423). The researcher is using non-probability sampling technique which includes purposive sampling which depends on the

judgement of the researcher when it comes to selecting people, organisations and pieces of data that the study is going to focus on (Latham, 2007). This technique assisted the researcher to focus on certain attributes of a population of interest. This in turn enabled the researcher to answer the research questions.

1.6.4 Data collection

According to Saunders *et al.*, (2009:69) literature review can be collected from different sources of data (see Figure 1.3 below), which include primary, secondary and tertiary literature sources, entails. Saunders *et al.*, (2009:75) state that planning a literature review gives the researcher a chance to conduct literature based on present studies not out-dated ones.

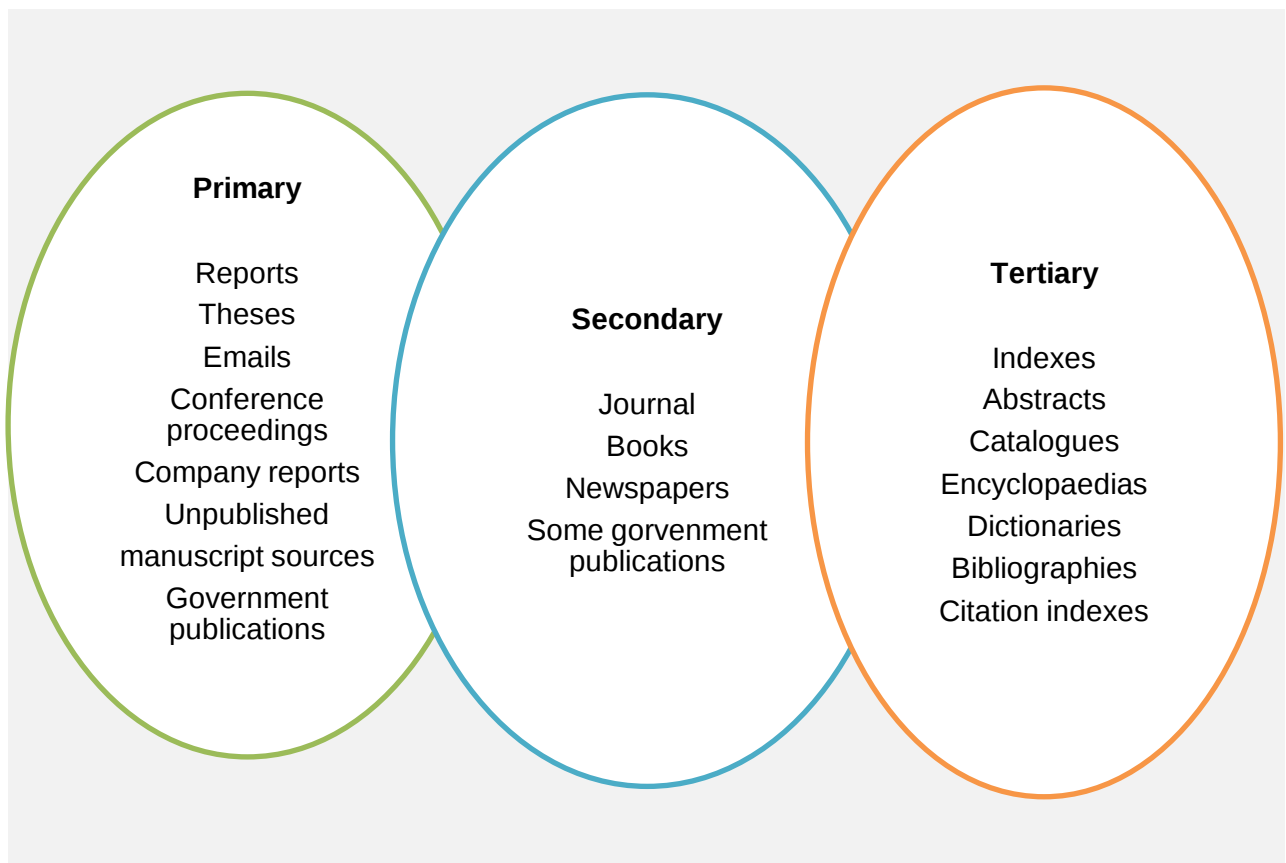


Figure 1.3: Lists of literature sources (Saunders *et al.*, 2009:69).

To determine the role of risk management to reduce IT projects failure, the following sources were consulted; relevant books from libraries, journal articles, internet, newspapers and

previous studies relevant to the topic. Risk management, project management and IT project failure were included in the literature review.

1.6.5 Data analysis

The captured data was analysed using the statistical package for Social Sciences (SPSS), Version 18.0 for Windows. The following statistical methods were used on the empirical data sets:

- Reliability and validity analysis, and
- Descriptive analysis.

1.6.6 Empirical study

Quantitative method was used for data collection and the empirical portion of the study. This comprised the following methodology dimensions:

- **Interviews** – Gill *et al.* (2008) state that the purpose for conducting interviews is to discover the opinions, skills, theories and motivations of persons on specific matters, Qualitative methods, such as interviews, are believed to deliver more accurate understanding of collective phenomena than would be acquired from other quantitative methods, such as surveys.
- **Collection of relevant documents** – The researcher collects all the relevant documents from different sources to conduct the study. Documents are any explanations wanted by a researcher to know the context in which why IT projects fail (Oates, 2006:117).
- **Surveys** – Provides a logical method to find data from statistics of people or instances and the survey information are then used to recognise trends (Oates, 2006:93).

1.7 LAYOUT OF THE STUDY

This study comprised of the following chapters:

Table 1.2: Chapters layout

Chapter	Title	Contents
Chapter 1	Introduction and problem statement	The chapter provides an introduction and background of project management, problem statement and research questions and objectives.
Chapter 2	Research design and methodology	The chapter provides the methodology that the researcher has employed in conducting the current study. The reason for selection of a particular methodology is also outlined in this chapter.
Chapter 3	Literature review of risk management and project management	This chapter reviews the background of project management which involves risk management.
Chapter 4	Literature review of IT project failure	This chapter reviews the background of Information Technology projects failure.
Chapter 5	Results and findings	The findings of the study are tabled and analysed in this chapter. The researcher also provides a thorough description of the finding about IT project failure.
Chapter 6	Conclusions and Recommendations	This chapter evaluates all the findings the researcher has provided and the recommendations to future studies on IT project failure are also provided in this chapter. A general summary of all the knowledge obtained from the study is also given in this chapter.

1.8 CONCLUSION

The accomplishment or failure of IT projects is measured based on the different criteria, and IT projects are failing at a high rate, which cost companies a lot of money. The chapter outlined the problem statement of the study and the research methodology which the study will be following. The research paradigm of the dissertation and quantitative methodology was defined on this chapter. This research aims to understand the role of project management in reducing information technology projects failure.

The following chapter will outline the research methodology and processes that were followed to make the study a success.

CHAPTER 2: RESEARCH METHODOLOGY AND DESIGN

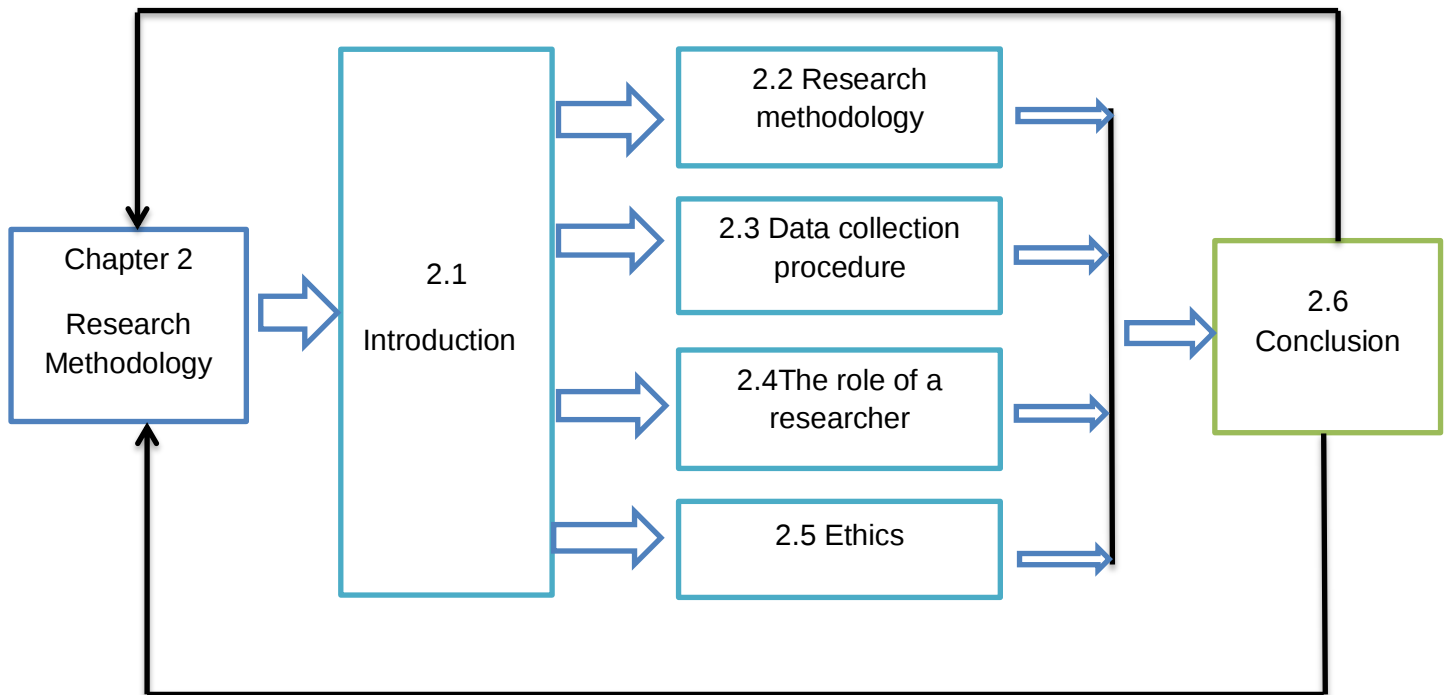


Figure 2.1: Flow of research methodology chapter

2.1 INTRODUCTION

This chapter discusses the research methodology of the study that was used to conduct the research within information technology projects and project risk management to discover the role of project risk management to reduce failure of IT projects. The objective of this chapter is to briefly explain research methodology that was proposed for the study using existing literature on research methodology and positivism research paradigm.

The purpose of this chapter is to describe how the researcher came into deciding which methodology to use and how to apply the paradigm to fit it the study. Choosing a research paradigm for the study is very important, and the research questions and research objectives were used to get to the conclusion of which paradigm to use for this study. Paradigms or research philosophies and research methodology are being explained to clarify the methodology used for this study. The research methodology and design chapter is divided into the following subtitles: Introduction (2.1); Research Methodology (2.2); Data collection procedure (2.3); Role of a researcher (2.4); Ethics (2.5); and Conclusion (2.6).

2.2 RESEARCH METHODOLOGY

Research methodology is used to help the researcher to make the right choice in conducting the research work in a relevant manner, and it also guide the researcher to be able to find solutions to the study (Rajasekar *et al.*, 2013). One can say that the research methodology is used as a guideline to the researcher to have clear understanding of what need to be done when conducting the research and the guideline will be useful to the researcher in such a way that it make the work of the researcher to be more easier than being complex.

Gray (2004:19) states that there is a connection between methodology and the researcher's view on epistemology and hypothetical perspective the researcher uses in his or her research (see Figure 2.2 below).

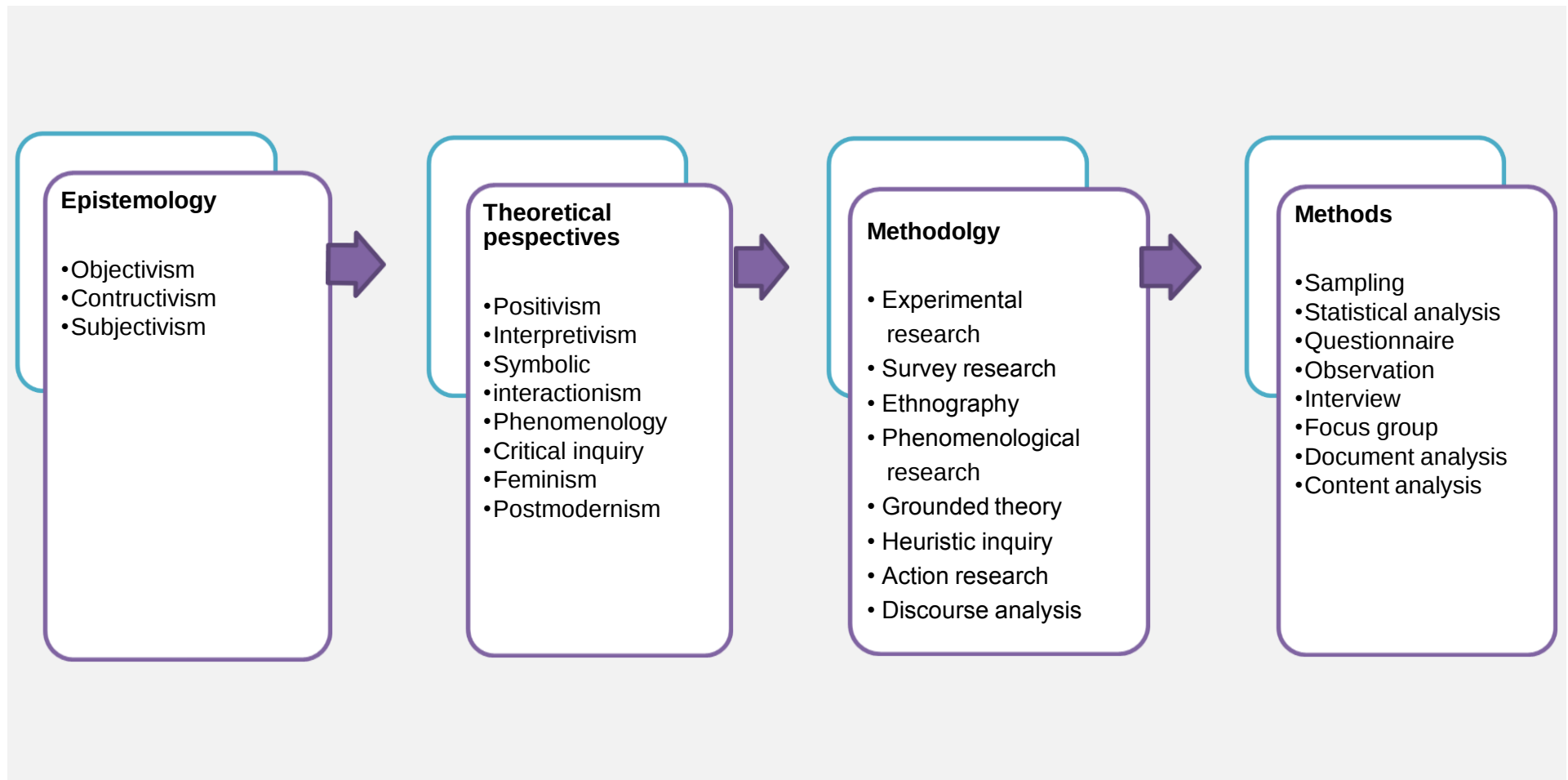


Figure 2.2: Relationship between epistemology, theoretical perspectives, methodology, and research methods Gray (2004:19).

2.2.1 Research paradigm

The researchers have to be mindful of the worldviews they use in their studies. It is for this reason that the entire research needs a foundation for its investigation (Creswell and Plano Clark, 2007:21). There are four main research paradigms, namely, positivism, realism, interpretivism, and pragmatism. These research paradigms are used in academic studies to solve research questions posed by that given study. For this reason it is important for the researcher to describe the methodology and research paradigm that his/her study is using. Oates (2010:282) states that it is not enough for a researcher to know these various paradigms and their assumptions. He or she also needs to understand how the quality of the research is going to be assessed by the readers or by other scholars. A research paper needs a foundation which will assist the researchers to understand the paradigm views used in a given study (Creswell and Plano Clark, 2007:21).

Research paradigm is described as an extensive view or viewpoint of something (Santos and Lima-Basto, 2014). Paradigm tells how research could be affected and directed by particular paradigm by mentioning that paradigms are arrangements of beliefs and practices that need enquiry within the study by providing procedures that the research has accomplished. One can say that paradigms are used to guide the researcher through the study (Krauss, 2005:759). The research paradigm will assist the researcher to complete the study; it will work as a guide for researcher to follow.

A research paradigm is an explanation of assumptions that the investigator make about the worldview that is used within those assumptions. According to Rowley (2002) research design offers the researcher the strategy and structure for the study in order to ensure validity on the results and findings attained. Table 2.1 below shows a summary of research paradigms according to Saunders *et al* (2009:119).

Table 2.1: Four research philosophies in management research (Saunders *et al.*, 2009:119)

	Positivism	Realism	Interpretivism	Pragmatism
Ontology:	- External - Objective - Independent of social actors	- Objective - independent of human thinking -Critical realist	- Subjective - Socially constructed - Change - Multiple	- Multiple - External - best when answer question
Epistemology:	-Provide facts - Focus on generalisation.	- Observable and provide facts. - Insufficient data.	- Social phenomena - Subjective meanings	-Observable - Subjective meanings - Based on practical
Axiology:	-Independent data - Objective	-Value laden - Biased - Cultural experiences	- Value bound - Subjective	- Interpret values - Objective and subjective
Data collection techniques most often used	-Large samples - Highly structured -quantitative, can also use qualitative	- Subjective - Quantitative or qualitative	- Small samples - Qualitative - in-depth investigations	- Mixed methods

Detailed explanation of four research philosophies:

- Positivist View** - Positivist methods depends a lot on investigational and manipulative methods, these guarantee that there is a space between the individual biases of the researcher and the objective reality of the study and it includes creating new hypothesis and analysis (Cohen and Crabtree, 2006).

According to Myers (2009:37) and Vaishnavi and Keuchler, (2004) positivist researchers think that objects that have been studied have attributes which can be used to measure quantitative study methodologies. Sage Publications (2011) refer to experiments as a hypothesis relating to a dependent variable which is tested using one or more independent variables in which controlled conditions are executed.

Positivist researchers use survey, questionnaires or experiments to gather information that will assist in writing a conclusion of the dissertation.

- **Realism** – Scheidenhelm (2007) states that realism is reinventing existence in literature. Gray (2004:26) states that realism assume that there is something to measure but it is not simple to do it.
- **Interpretive View** – The philosophical assumptions of the researcher can classify qualitative research as interpretive or positive (Rowlands, 2005: 81). According to Cohen and Crabtree (2006) qualitative research emphasizes on understanding the way individuals interpret and make logic of their skills and the world in which they are living in and it depends more on real-life methods such as (interviewing and observation and analysis of existing texts), these approach confirm an adequate discussion between the researchers and those with whom they interact in order to create a meaningful reality. Usually, meanings are evolving from the research process (Cohen and Crabtree, 2006).
- **Pragmatism** – McDermid (2006) states that pragmatism is an philosophical trend that involves those who claims that an ideology or proposition is factual if it works acceptably, that the definition of a proposition is to be established in the practical consequences of accommodating it, and to reject ideas that are not practical.

This current study used the positivism paradigm which comprises of quantitative approaches for collecting data. These assisted the researcher to have a solid understanding of the background of the study. Quantitative research is a methodology which uses data gathering procedures such as questionnaire and statistical methods as its data analysis technique which involves graphs or statistics (Saunders *et al.*, 2009:151). Quantitative research is focusing on studying large number of cases and analysing the results based on statistical approach (MacDonald & Headlam, 2011:9). For this reason the study contains the features of positivism paradigm which involves quantitative methods for data collection for a researcher to have better understanding of the study.

2.2.2 Literature review

The researcher is used different sources to collect data for literature review chapters (Chapter 3 and Chapter 4). To determine the influence of risk management in project management to reduce Information Technology projects failure, the following sources were consulted: relevant books from the libraries, journal articles, internet, newspapers and previous studies relevant on the topic will be used.

2.2.3 Research design

2.2.3.1 Mixed methods research

A method that is used to provide a solution to a research query by using qualitative and quantitative data gathering and analysis is referred to as mixed method research (Teddlie & Tashakkori, 2009:23-27). Mixed method allows the researcher to offer generation and verification of philosophy in similar study making use of confirmatory and exploratory inquiries (Teddlie & Tashakkori, 2009:33).

2.2.3.2 Quantitative research design

The structure of research questions and objectives involve certain standard for decision-making action of quantitative method, therefore quantitative research was chosen to complete the study (Zikmund and Babin, 2013:99). Quantitative research method involves using numeric data to analyse truth. Quantitative research design is used to gather measurable and observable data (Creswell, 2008:54).

2.2.4 Research methods

Bryman (2006) argues that methodology can be divided into three types which are quantitative, qualitative and mixed-methods methodologies, which refers to as different research methods. Quantitative research allows the researcher to be objective and independent throughout the study (Johnson and Onwuegbuzie, 2004:14). Qualitative research involves various philosophical assumption; data gathering methods and approaches to inquiry (Creswell, 2009:173). Mixed-Methods readings include theory deductively in theory analysis and verification, or inductive as in an evolving philosophy of design (Creswell, 2008:153).

2.2.4.1 Survey research

For the determination of the current study the researcher is used a questionnaire to gather data as it is used to gather a huge amount of data from different individuals (Shiu *et al.*,

2009:226). The researcher created questionnaire of her own and send it to participants to take part on the study as the survey need a method in which data gathering procedure is set to gather data in reliable way for analysis (Malhotra, 2010:334). Survey provides a logical method to find data from statistics of people or instances and the survey information are then used to recognize trends (Oates, 2006:93). The questionnaire used in this study was structured in a way that assisted the researcher to answer the research questions and achieve the research objectives.

2.2.4.2 Validity and reliability

The captured data was analysed using the statistical package for Social Sciences (SPSS), Version 18.0 for Windows. The following statistical methods were used on the empirical data sets:

- **Reliability and validity analysis**

It is important to test for validity and reliability before starting to analyse the output of the survey questions. Reliability is the degree to which a measure is free from random error (McDaniel and Gates, 2010:251) and thus specifies the inner reliability of a measure (Zikmund and Babin, 2010:334).

- **Descriptive analysis**

Descriptive statistics can make summary of large data (Hair *et al.*, 2013:257).

The purpose of descriptive statistics is to draw summary of large data attributes (McDaniel & Gates, 2010:406).

2.2.5 Sampling and Population

According to Shiu *et al.*, (2009:450); Zikmund and Babin (2013:312) a group of elements that have similar attributes which attract the researcher is referred to as a population. Sampling refers to the features inside the population that are available when conducting sampling technique (Hair *et al.*, 2013:137). The target population and sampling frame for the study is explained below.

2.2.5.1 Target population

The goal of this research was to study post-graduates with respect to their knowledge and experience in project management and IT projects. An appropriate sample of no more than 150 people which includes students and people working with IT projects was obtained by sending out questionnaires to the participants. Each individual who agrees to participate was asked to read and sign a consent form.

2.2.5.2 Sampling Frame

The target population for this study was not more than 150 people. Some of the targeted participants were the people who work with IT projects including project managers within the IT industry while some were students who studied project management or graduates with IT qualification. The participants were of different genders.

2.3 DATA COLLECTION PROCEDURE

2.3.1 The research process

When conducting a research for the dissertation it is important to choose the appropriate approach or research process to use throughout the study. Figure 2.3 below displays the components of the research process.

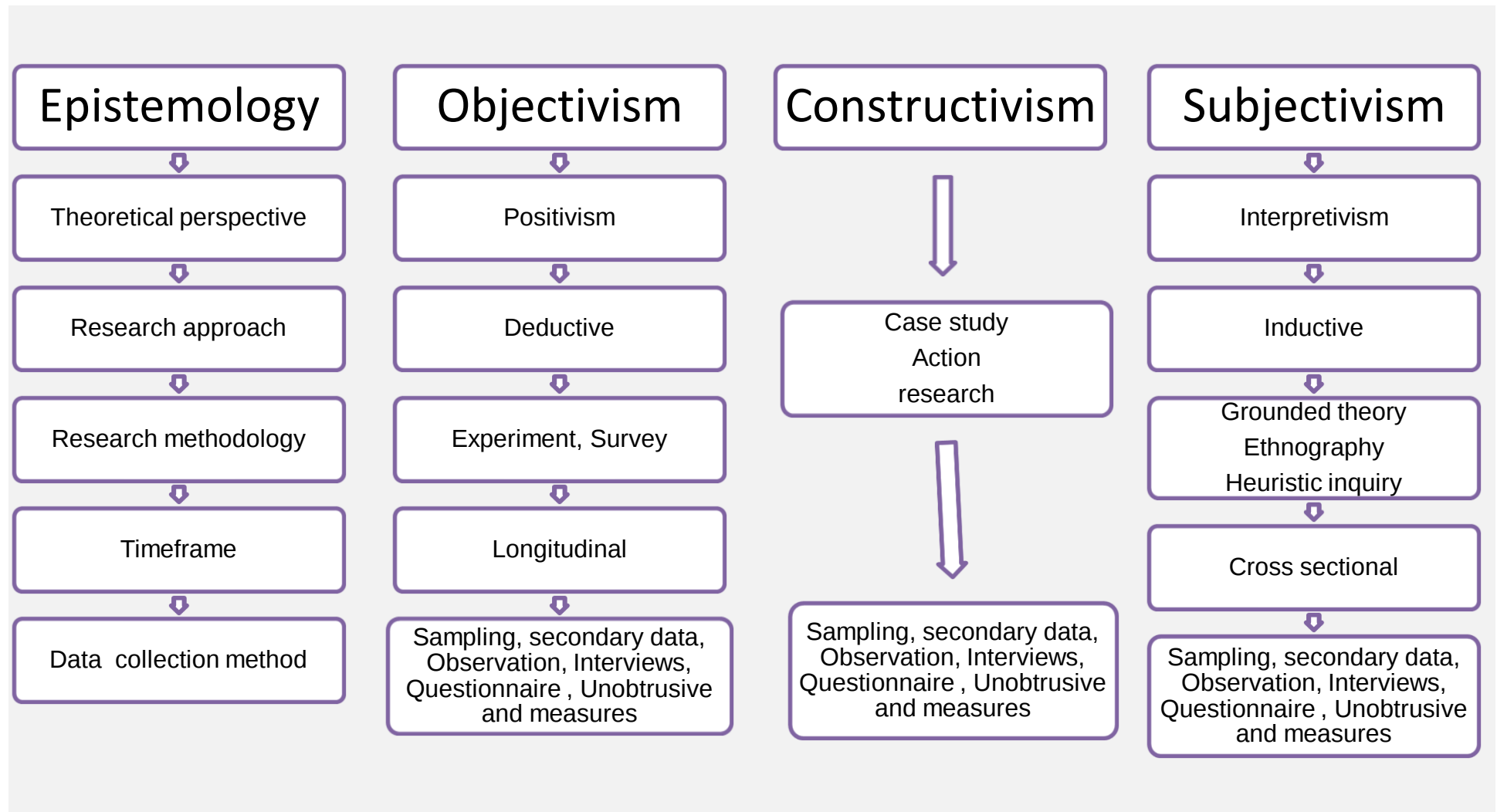


Figure 2.3: Elements of the research process Gray (2004:35)

The current study used positivism theoretical perspective, deductive research approach, and survey research methodology. The data collection methods used were observation, interview and survey methods.

Each research needs a research process to guide the researcher throughout the study. Figure 2.4 below displays the steps that will provide guidance to the researcher to conduct the research Creswell (2012) defines the research approach as follows:



Figure 2.4: Research process (Creswell, 2012).

Deduction and induction are two parts that are involved in scientific inquiries (Gilbert, 2007:27). The research approach or research process consists of the steps of techniques that the researcher use in order to develop their own study or research paper; the research process also includes identification, assessing, analysing and developing ideas of the researcher (Williams, 2013). Rajasekar *et al.*, (2013) defines research process as way of using different objective approaches and procedures to obtain knowledge. Quantitative research methodology is deductive that uses questionnaire as a data collection method.

According to Rajasekar (2006) people tend to do research for many various reasons, some do research to solve problems that where not solved, some do research because they are curious to find out about the unknown facts and events, and some conduct a research to find new things that have not being established. The reason for conducting the study is to understand the role of risk management to reduce failure of IT projects.

Terblanche (2012:7) states that research questions are used to guide any applicable research methodology of a study. Oates (2006:34) states that research questions can be used to the solve problems raised in at research paper. The researcher herein has therefore used research questions and research objectives to help solve the research problem that are in chapter 1 of the study. The study followed the set steps that are used to conduct research (see Figure 2.2.). These steps are set out as follows:

Step 1- Finding research problem;

Step 2 - Reviewing the literature of existing studies;

Step 3 - Identify the goal of the study;

Step 4 - Collection of data;

Step 5 - Analysing and interpretation of data, and

Step 6 - Evaluating data and writing a report.

2.3.2 Motivation to the study

There are questions that I have been asking myself about the importance of project risk management in IT projects and I could not figure out the answers to such questions, however I decided to research thesis for the following two reasons:

- 1) The main reason I am doing this research is to understand the exact concept of project failure in IT, find out exactly what causes failure in IT projects, and find out how project risk management can reduce IT projects failure.
- 2) The second reason is to find something that will help me grow in IT industry and project management, and the topic that I have chosen will help me understand the combination of project management and IT.

2.3.3 Research questions

The research questions may arise from aspects such as insufficient literature or the necessity to solve a particular problem. Below are the questions formulated for the current study; these include the main research question and the sub-questions.

2.3.3.1 Main research question

How can risk management in projects reduce failure in information technology projects?

2.3.3.2 Research sub-questions

- **Question 1:** Why reduce risk in project management?
- **Question 2:** What causes failure in information technology projects?
- **Question 3:** How to determine risk in an information technology projects?
- **Question 4:** Why use project management and risk management together?

2.3.4 Objectives of the study

2.3.4.1 Primary objective

The primary objective of the study is to understand the role of project risk management to reduce failure in information technology projects.

2.3.4.2 Theoretical objectives

In order to achieve the primary objective, the following theoretical objectives were formulated for the study:

- **Objective 1:** To gain understanding of risk management in project management.
- **Objective 2:** To gain understanding of risk management by focusing on determining risks in IT projects.
- **Objective 3:** To gain understanding of failure in Information Technology projects.

- **Objective 4:** To gain understanding of project management.

2.3.4.3 Empirical objectives

In accordance with the primary objective of the study, the following empirical objectives were formulated:

- **Objective 1:** To determine the role of project risk management to reduce failure in IT projects.
- **Objective 2:** To analyse the data gathered from questionnaires to determine the use whether the information will be useful to IT projects.
- **Objective 3:** To determine whether information on reducing IT project failure will play valuable part in future projects that involves IT.
- **Objective 4:** To provide information about how project risk management can be used to reduce failure in IT projects.

The next section provides research strategy aimed at guiding the researcher throughout the process of conducting the study.

2.3.5 Research strategy

In order for the researcher to complete the study a research strategy is needed. Saunders *et al.*, (2009:141) explain research strategy as a plan the researcher uses to answer the research questions and enable the researcher to achieve the objectives. One can say a research strategy is a plan in which a researcher follows to complete the study and answer the research questions and ensure the research objectives for the study are met. According to Saunders *et al.*, (2009:141) there are different research strategies which are as follows:

- **Experiment** - Saunders *et al* (2009:142) state that experiment enables the researcher to study whether the variation in one independent variable create a variation in additional dependent variable;
- **Survey** – Deduction approach is frequently used when conducting surveys for the study (Saunders *et al*, 2009:144);
- **Case study** – Case study enables the researcher to answer the questions such as “why?, what?, and how?, it is also used on data gathering methods such as

interviews, observations and documentary analysis, which concludes that case study is used for explanatory research (Saunders *et al.*, 2009:146);

- **Action research** - Saunders *et al.*, (2009:147) states that the results of action research can be found by being involved with the organisation members who have experienced the matter;
- **Grounded theory** - Saunders *et al.*, (2009:148) states that grounded theory can be used in inductive method, it helps the researcher to explain and predict the behaviour based on emerging and building theory;
- **Ethnography** - Saunders *et al.*, (2009:149) states that ethnography is rooted from inductive method; it describes the social world the study subjects populate in the manner in which they would explain and define it. The study need to be responsive to adjustment because the researcher will continuously be developing new patterns of thought about what is being detected (Saunders *et al.*, 2009:149), and
- **Archival research** - Saunders *et al.*, (2009:150) states that archival research makes use of documents that are saved on the database as a source of data. Archival research strategy allow the research to ask questions that are focused on the pasts and changes from time to time, it can be exploratory, descriptive or explanatory (Saunders *et al.*, 2009:150).

The study uses survey as research strategy. To determine the role of project risk management to reduce information technology projects failure a literature was carried out using relevant books from the libraries, journal articles, and internet. Risk Management, project, IT project failure and IT project success were included in the literature review.

Some of the techniques for data gathering are interview and survey, which are explained under 2.3.5 Subheading. The researcher conducted the current study with a view of giving clarity to all the point raised in this section of the study.

2.3.6 Data gathering technique

According to Stewart (2005:116) a project is uniquely defined by its nature and the data collection method suitable for the study should be selected to gather relevant data. Data can be gained from many sources and there is indefinite supply of data sources which can be separated into minor data and major data (Tustin, 2005:88). Primary research methods refer to surveys, interviews and observations (McNeill & Chapman, 2005:131).

The target population for this study was not more than 150 people. These are people work in IT projects, some are project managers within the IT industry while others are people who studied project management or are graduates. These people were chosen from across all genders. The study took a period of two years.

The researcher is used non-probability sampling technique which included purposive sampling which depends on the judgement of the researcher when it comes to selecting people, organisations and pieces of data that the study is going to focus on (Latham, 2007). This technique assisted the researcher to focus on certain attributes of a population of interest, which in turn enabled the researcher to answer the research questions. The purposive sampling technique used in this study was critical case sampling because the research is quantitative and as such it helped the researcher to find out if the phenomenon of interest even exists.

The survey questions was sent to North West University (NWU) Vaal campus ethics office, once ethical clearance was approved the survey questions were sent electronically to the participants using email. The e-mail contained the background of the study and the link of the survey created on the website. All the participants were assured that their responses to the survey will be kept anonymously which will be set to not to store participants personal information as they take part responding to the survey. The email notice was sent to participants 3 days before the closing date of the survey to remind the participants to take the survey, and the time that the survey was opened for individuals to take part was four weeks. A week after the closing date email was sent to all the participants thanking them for taking their time to respond. A consent form was attached to the email for participants to sign.

2.3.6.1 Interview

Interviews involves communication between two people which is interviewer and the interviewee, where by the interviewee answers the questions to uncover motivations, beliefs, feelings and attitudes (Malhotra, 2010:185). The interviews were one-on-one sessions and the interviewees were allowed to answer questions openly.

2.3.6.2 Observation

All the participants who took part in interviews were observed while answering the researchers' questions. The researcher observed things such as body language, eye contact and facial expression of the participants while answering questions. This was done in order for the researcher to determine if the participants were positive while answering questions or if they were having doubts about their answers or if the participants are not fully committed to the given time in answering the interview questions. The time taken by each participant to answer the researcher's questions was also noted.

2.3.6.3 Survey

The researcher formulated a survey which had to be completed by the participants. The questions of the survey were based on the research title of the study.

2.3.7 Results of data analysis

Oates (2006:37) states that method triangulation is when different techniques to collect data have been used and then compare the results found. This study used interviews, observation, and survey as techniques to gather data with the purpose to support the output or outcomes obtained.

SPSS 18 was used to analyse data on this study. Pareto analysis was also used to check the support from the largest to the lowest.

2.4 THE ROLE OF A RESEARCHER

The role of a researcher is to form a partnership with the participants in order to gather data and analyse it, with the purpose of ensuring that the investigated phenomena is understandable (Maree and van der Westhuizen, 2007:41).

The researcher's role in the current study was as follows:

- The researcher requested permission from University's Research Ethics office by submitting checklist, consent form.
- The researcher presented the proposal to the research committee which then gave approval for the researcher to continue with the study.
- The researcher gathered survey questions.

- The researcher then distributed questionnaire to various individuals.
- The researcher then examined the collected data.
- The researcher then wrote the research report.

2.5 ETHICS

It is very important for a researcher to preserve uppermost possible ethical standards in a particular study. The researcher needs to predict ethical problems that may come up during the study (Creswell, 2009:87). When people participate in a study the ethical clearance form is issued to them to sign it. In this study data was collected about the role of project risk management to reduce failure of information technology projects. An ethics clearance used in this study was obtained and applied to the environment in which participants participate in the study and the institution in which the researcher is enrolled.

Smith (2003) states the following about research ethics:

- **Be conscious of multiple roles** – individual was not forced to participate in the study, therefore it was important to notify participants that they are participating voluntarily and as such were not under any obligation to participate. Participants were told that they can withdraw from the study at any time.
- **Follow informed-consent rules** – the researcher made sure that the participants know the purpose of research, their right to withdraw or decline when the research has started, whether there are any research benefits, and that they must keep information confidential.
- **Respect confidentiality and privacy** – the limits of confidentiality was discussed to participants. The participants signed the consent form.
- **Tap into ethics resources** – the researcher need to know the ethical obligations and professional ethics when conducting the study. This was observed in this study.

The researcher completed the work-well ethics checklist and also consulted the North-West University's ethical review decision tree in this regard. The researcher made sure that the data of participants is kept confidential and it doesn't harm the participant's time and privacy. The ethical checklist form was submitted to the ethics office and it was signed on the 29 July 2015 by Faculty of Economic Sciences and Information Technology. The researcher was then granted an approval from the university to conduct the research on NWU (North West University) campus.

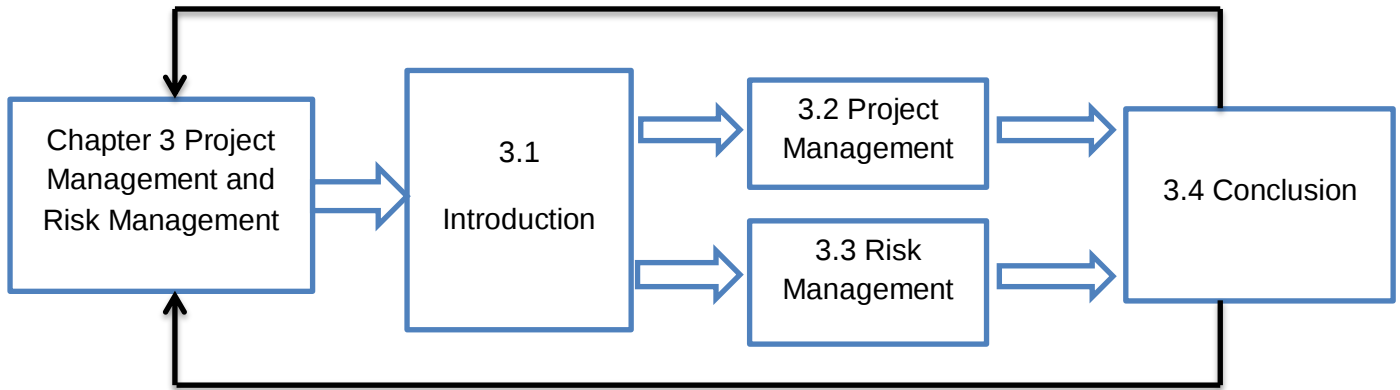
2.6 CONCLUSION

In this chapter the research methodology was discussed, and the research design was chosen to answer the research questions that arose from the problem statement.

Quantitative methodology was proposed for this study and various research methods were used to conduct the study. The research methods used involves survey, interview and observation. The literature review was conducted from the existing studies to help the researcher to understand the background of the study.

The role of a researcher was stated on the above sections to help the researcher while conducting the study, the data gathered was analysed using SPSS software to perform the following empirical data sets which are reliability, validity analysis and descriptive analysis.

This chapter explained the reasons for using quantitative methodology for this study, and the research questions and research objectives were stated. The following chapter provides full details of project management and project risk management.

CHAPTER 3: PROJECT MANAGEMENT AND RISK MANAGEMENT**Figure 3.1:** Project management and Risk management flow.**3.1 INTRODUCTION**

It is important to conduct a literature review of previous studies when conducting a research. This helps the researcher to read and to know more about what other researchers have found or have solved in the same study field. According to Boote and Beile (2005) the purpose of a literature review is to make sure that there is no duplication of research. It also allows the researcher to read and learn about the previous study and ensure that the new work to be produced will bring value to the study field. Terblanche (2012:7) states that the research that has a literature review can be useful and will provide innovative thinking to future researchers, and supports this by saying the reason is that assumption cannot be verified to be true or false without accurate evidence that support the idea and it is not possible to produce new ideas without referring to previous success or failure.

The primary objective of this study was to understand the role of project risk management in minimizing failure in information technology projects. In order to accomplish this, the existing literature on project management and project risk management was needed and as such formed part of expressive knowledge which contributed to this study. The determination of this chapter is to outline Introduction (3.1); Project management (3.2); Project risk management (3.3), and Conclusion (3.4).

3.2 PROJECT MANAGEMENT HISTORY

According to Carayannis *et al.*, (2003:1) project management has been in existence since the Egyptian era. The existing project management tools and procedures had been used for over half a century in difficult projects by different organisations. Project management methods were used in 1950s by Navy in Polaris project, NASA, Department of Defence and engineering and construction companies started using project management values and techniques to manage large projects during the 1960s and the 1970s (Kwak and Anbari, 2008). Stretton (2007) states that during the 1980s and the 1990s PMI's PMBOK was introduced in the field of project management and a balanced approach for project life cycle was also introduced. According to Sengupta *et al.*, (2014:2) the years around the 1950s are noticeable as the commencement of the project management era. The following four periods of evolution of project management are identified (Modesto and Tichapondwa, 2009):

- **Past to 1958** – The development of technology such as automobiles (allowed active resource distribution and flexibility) and telecommunication (increased the communication speed in which individuals communicate) made project schedule to be shorter.
- **1958 to 1979** – Management science application: An increase use of project management took place in computer technology and space technology.
- **1979 to 1980** – Human resource production centres: software technology and innovative space technology applications started progressing in this period.
- **1995 to present** – New environment creation: evolution of internet and more collaborative technologies developed in this phase. Project management software's have internet connections.

A project management is well-defined as a process of completing the goals specified while making use of valuable resources such as budget, schedule, human, equipment and energy over a specific period of time (Narayana and Khasim, 2012). Project is not taken as part of everyday business operation, it is a temporary and it is detailed, it is said to have the starting point and ending point (Abdollahi, *et al.*, 2012). It can be said that project management is a procedure to ensure that project team has tasks to do and the tasks are being scheduled by a project manager, and the project has to be started and finished on a specific period. In order to complete the project the project management has to be used from the beginning until completion of a project.

Nienaber & Bardnard (2007) states that Software Project Management is a procedure of preparation, arranging, staffing, observing, controlling, and leading a software project. Figure 3.2 shows the framework of key elements in SPM.

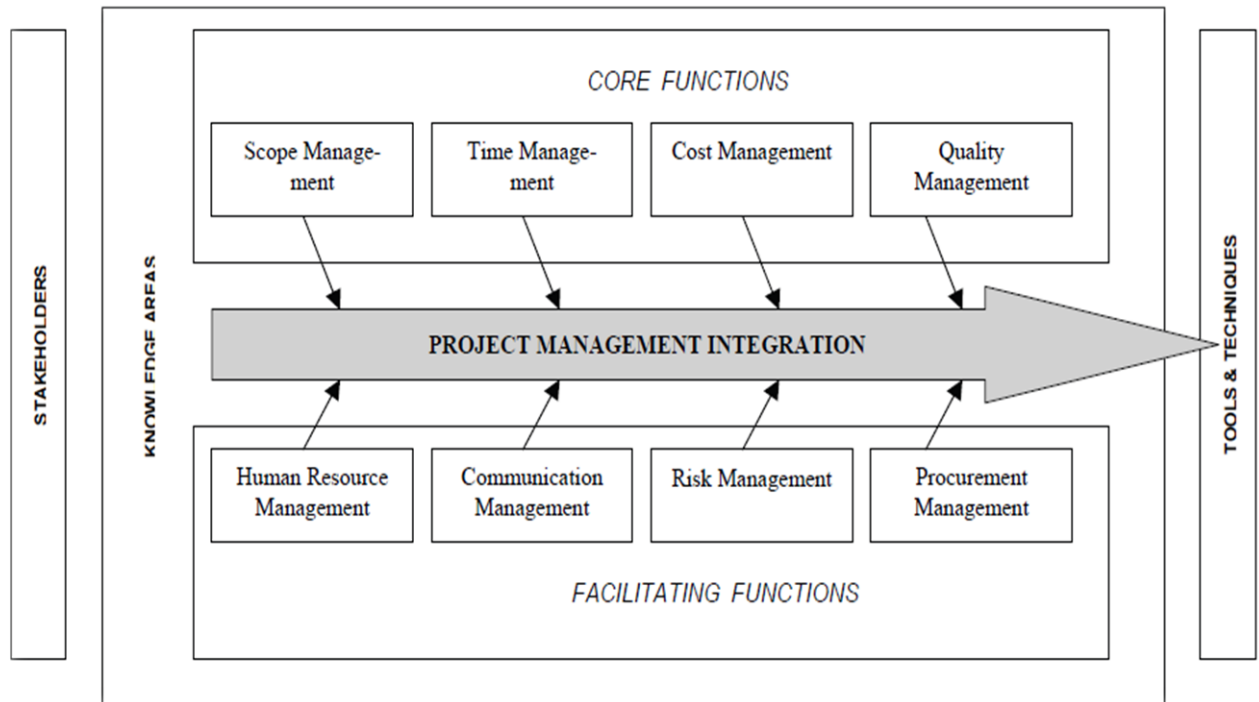


Figure 3.2: Software Project Management Framework (Nienaber & Bardnard, 2007).

The study focused on project risk management to determine the role of project risk management to reduce IT projects failure.

3.2.1 Project Definition

According to Yimam (2011:15) the term project is well-defined by various authors to explain different aspects. The way in which resources are organised, such as a team of persons who are assigned to perform various tasks in order for them to accomplish the objectives in a limited time is a definition of a project (PMBOK Guide, 2008:434). Barnes (2012) defines a project as distinctive, transient endeavour, taken to accomplish a planned objectives which can be distinguished in terms of results, productions or outputs.

A project is a short-term endeavour started to create a distinctive artefact or service, each and every project that has a starting date and ending date is considered a short term project. Distinctive means that the artefact or service is dissimilar in some individual way from all other artefact or services. For many groups, projects are a means to answer to requirements that cannot be addressed within the group's normal working boundaries (Choudhuri, 2014:3). Kerzner (2009:2) provides the following four ways in which project can be categorised:

- A clear objective to be accomplished within certain conditions.
- Defined beginning and ending periods.
- Budget limit.
- Multifunctional (i.e., cash, resources, tools).

Table 3.1: Characteristics of a project, Burke (2007:16)

Term	Explanation
Start and finish	Project has clear starting and ending date.
Life-cycle	Projects have starting point and ending point with different phases in between.
Schedule and timeline	Projects start on a specific date and end on a specific time.
Budget	Each project has costs that are assigned to it.
Unique	Each project is unique from other projects.
Resources	Resources are things that are required from other departments and they need to be organised.
Single point of responsibility	Project leader take charge to ensure that the project get completed
Team members	Each project has project team members who form a team that will make sure the project is completed.

According to Sengupta *et al.*, (2014:1) and Pellerin *et al.*, (2013:3) projects have the following characteristics:

- A project has a pure purpose that can be accomplished in a period of time;
- It has a time where by the deliverable is being completed or achieved;
- Is determined to accomplish certain outputs;
- A project manager or a supervisor is assigned to ensure that the outcomes are handed on time, and

- It is not repeated once is done.

One can say a project is a unique task that has to be completed on a specific time; it has a start date and an end date in which the artifact or deliverable will be handed over to the stakeholders. For a project to meet the milestone there must be a project manager who manages the project from start day to the completion date and ensures that scope and project requirements are met, a project produce deliverables based on the requirements of the stakeholders.

3.2.2 Project Management definition

Project management is a procedure of accomplishing project goals such as completing project on time, within budget and the performance is excellent, by completing set series of activities that has starting date and ending date to provide deliverables that are quantifiable and qualifiable (Kay, 2013). Project management can be described as an approach of keeping track and arranging a project (Curlee, 2008).

Kerzner (2009:3) defines project management approach as planning, organising and managing people involved in the project to produce a successful deliverable that meet project objectives and goals at the end of the project. Project management includes project planning and project monitoring and defines them as follows:

- **Project planning:** Involves defining the requirements of the work that need be done, defining the quality of work and also the resources have to be defined at the planning stage.
- **Monitoring project:** Involves tracing project progress, and then the results obtained will be compared to the predicted results, adjustments and impact analysis is made. Completing a project within schedule, budget at good performance is said to be a successful project. The benefits of project management are: to ensure that all tasks are counted, nonetheless of personnel income, identifying schedule, identifying trade-off analysis method are the functional responsibilities that need to be identified (Kerzner, 2009:3).

Project management includes process groups (PMBOK, 2013). Processes of project management are as follows:

- Initiating;
- Planning;

- Executing;
- Monitoring;
- Controlling, and
- Closing.

3.2.3 Project Management phases

The success of project management relies on ensuring that tasks, resources and people who are assigned the role of making sure that the business goals and objectives produce the desired deliverables and that such is done within the given time and budget (Sengupta *et al.*, 3:2014). Division of project management phases helps in managing the project better (Baars, 2006).

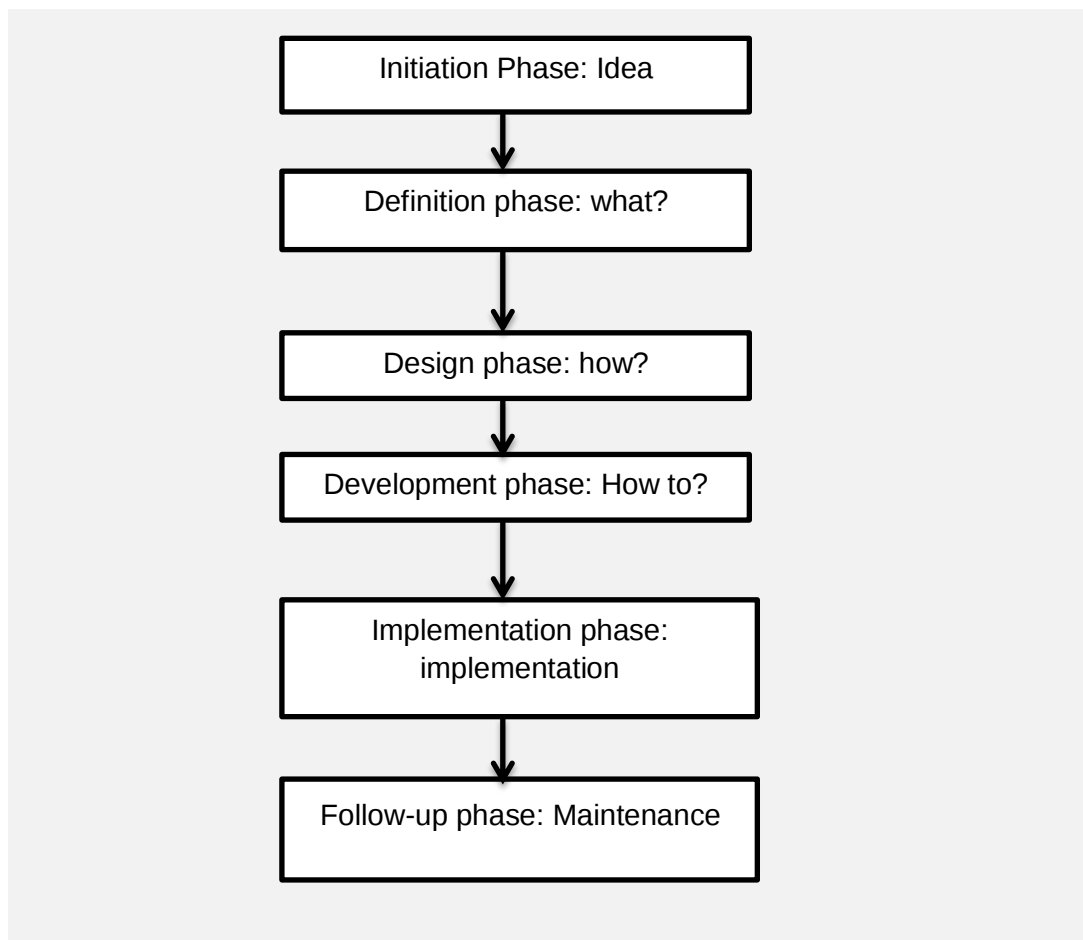


Figure 3.3: Project management in six phases, with the central theme of each phase (baars, 2006).

Phases of project management:

- **Initiation phase** – Pathak (2014) states that project is started and project sponsors and stakeholders meet to decide if they continue with the project or not or to choose to take another project and collecting requirement and analysis is executed. The initiation phase is the beginning of a project where the idea is being discovered and explained, in this phase the decisions are made to determine who will manage the project from the beginning to the completion and which people will be involved in the project and to check if the project is being supported by relevant individuals.
- **Definition phase** – during the definition phase the project requirements are being clearly mentioned, this involves the anticipations that involved parties have to ensure that the project results are met.
- **Design phase** - the requirements that are mentioned in the definition phase are used to do the designs such as flow charts, prototypes, UML schemas and then the project manager choose relevant design that will be used to ensure success of the project.
- **Development phase** – during the development phase all the required things are being arranged, schedule is being made, materials and tools are ordered, and instructions are given to the individuals who are part of the project. The development phase is called complete when implementation is ready.
- **Implementation phase** – this phase involves the creation of project work, coding of programmers, development of graphical user interface by designers and the construction of buildings.
- **Follow up phase** – here the documentations for project are being created, training to users takes place. This phase bring project to completion.

One can say that project management has five phases which are **initiation phase**- project managers meet for a kick-off meeting to discuss if they should continue with the project or not and initiation phase happens in every phase of the project. **Definition phase** – the scope and requirements are being mentioned and the team define the work that needs to be done for project. **Design phase**- the project manager choose the flow they are going to use throughout the project. **Development phase**- schedule is developed and then the team members are given the tasks to do. **Implementation phase**- during this phase programmer's start to code, designers are designing and other team members are working. **Follow up phase** – all the documents needed for project are being created and then the training is given to the users and the project reach its mile stone.

3.2.4 Project Manager and Project Managers skills

Having the title of project manager does not mean everyone who has it know how to manage projects successfully (Schiff, 2013). Project management is growing and the skills for project manager cannot be based on technical skills only, soft skills are also needed for project success (Gillard, 2009). Brandon (2006:14) states that project management is taken as important skills that IT professionals need since IT projects fail.

Project managers are eventually accountable for performance of the project; their job is to make sure that relevant adjustments are made between the time, cost, and performance requests of the project and they generally retain only fundamental technical information to make such conclusions and they also have to make sure that they select the right people to take part in the project at the right time to perform tasks and make right choices (Larson and Gray, 2010:10). Project managers need to have technical skills. Table 3.2 below outlines the skills that project manager should have:

Table 3.2: Management skills for project managers Perkins *et al.*, 2003:1-5

Skills	Descriptions
Integration Management	To be able to achieve project goals a project manager should be able to cooperate with all the departments of the organisation.
Scope Management	Project managers should be able to give a clear explanation to the team about the project. Project manager have to be knowledgeable about the project because there are briefings and feasibility studies that will be taken before the start date of the project.
Time Management	Project managers have to make a plan of when activities will take place because projects have a starting date and an ending date.
Cost Management	Project managers should be able to make precise quotations for projects.
Quality Management	Quality planning, quality assurance and quality control have to be taken into consideration by project managers.
Communication Management	Project managers have to make sure that all the communication made though out the project has to be understood by project team members.
Procurement Management	For project to deliver the outcomes then it is necessary for project manager to manage procurement procedures.
Human Resource Management	Must be able to organise team members to execute the functions of a project
Risk Management	Project managers have to be able to identify risks and have solutions on how to solve them.

Project Managers have to be knowledgeable about the above skills in order to ensure that the projects meet the deadline and the project meets the requirements of the stakeholders. Project managers' skills play a very essential role to determine project success or project failure.

3.2.5 Project Management knowledge areas

Chung (2014) states that knowledge area consist of set of procedures, each with inputs, tools and practices, these processes ensure that project is taken care of until the success stage, thus knowledge areas is made up of 47 processes of PM and knowledge area ensure that the skills and experience required is attained to meet project goals.

Egeland (2011) and Heagney (2011:20) describe the role of Project Management knowledge areas in process groups which are i. Initiation, ii. Planning, iii. Executing, IV. Controlling and v. closing as follows:

1. **Project integration management** - Project integration management consists of Project plan development, project plan execution and integrated change control, project planning and execution includes comparing the goals of the project to ensure that it become successful when it completes. The change control controls the project plan and project execution.
2. **Project scope management** - Project scope management consists of all the work that needs to be done throughout the project, it involves five processes: Initiation, scope plan, scope definition, scope verification and scope change control (Heagney, 2011:20).
3. **Project Time management** - Time management consists of activity definition, activity sequencing, activity duration estimates, schedule development and schedule control processes. The project plan is designed to show estimated time to complete the activities.
4. **Project Cost Management** - Project Cost Management is made up of resource planning, cost estimating, cost budgeting and cost control processes, this ensures that the project costs do not exceed the estimated budget.
5. **Project quality management** - Knowledge area make sure that the project meets the requirements as expected, this keep an eye on project performance and the outcomes. Processes involved are quality plan, quality assurance and quality control.
6. **Project HR management** - Project HR management involves organisational planning, staff acquisition and team development, here the leadership skills and communication skills are essential to a project manager to ensure that certain skills and communication skills are required.
7. **Project communication management** - Project communication management is made up of communication planning, information distribution, performance reporting

and administrative closure processes. These processes make sure that project plans, meetings and risk assessments are written in black and white.

- 8. Project risk management** - Project risk management involves risk management planning, risk identification, quantitative risk analysis, qualitative risk analysis, risk response planning and risk monitoring control. These processes are to deal with the risks that might happen to the project.
- 9. Project procurement management** - Knowledge involves procurement planning, solicitation planning, solicitation, source selection, contract administration and contract closeout.

One can say that project management areas are nine and they consist of 47 processes that take place within those knowledge areas. And in order to complete the project successfully the project management knowledge areas have to be considered from the beginning of the project to the end of the project. One can conclude that project management knowledge areas play important role in the success of a project since each knowledge area has processes that have to accomplish. A project needs to have an individual who is responsible for knowledge except project manager (Pretorius & Steyn, 2005:48).

3.3 PROJECT RISK MANAGEMENT

Barkley (2004:4) states that risk is anything that can harm project and person involved in a project can control or track, this means that there are many risks in any project. Project RM is usually regarded as a procedure to reduce uncertainty and its consequences, which will lead to success of projects (Nehari talet *et al.*, 2014:1-9). It is the discipline in which a variety of approaches are carried out to tolerate on a particular problem (Nehari talet *et al.*, 2014:1-9). Risk Management is assessing things that can cause harm to projects and make projects fail (Chaffey & Wood, 2005:362).

Risk management enable IT projects managers to include constancy among operational and economic moneys that maintain their important organisation information (Stoneburner, *et al.*, 2002:1-4). Brandon (2006:157) states that risks cannot be evaded in any project, especially IT projects, and the project manager may be in crisis manner if they do not follow the risk management principle in the project. Risk Management information have to assessed cautiously and associated with business strategy as new IT project can cause huge impact on essential business functions (Chaffey & Wood, 2005:362).

Nehari talet *et al.*, (2014:1-9) state that IT projects can face high risks, further state that there is large change in IT projects that leads to increase on costs of the project. According to Nehari talet *et al.*, (2014:1-9) IT projects fail at high rate, and states that there are top 5 risks that part of IT project failure, namely: lack of employees; improbable schedule and costs; high expectations; unfinished scope; and reduced opportunity because of late submission. Managing risks in IT projects can lead to reduction of risks.

3.3.1 Project Risk Management Framework

Shortreed *et al.*, (2003:7) state that risk management framework is an explanation of an organisation definite set of functional activities and definitions that describe the organisation's risk management system and relation to the organisational risk management system. Risk management framework helps the project be checked for risks and make them available for utilisation in decision making process (Cloete, 2009:10).

3.3.2 Project Risk Management Processes

Nehari talet *et al.*, (2014:1-9) states that risk management is an everlasting cycle procedure that includes activities for starting, monitoring and making sure that improvement of the organisation's activity continues. Lew and Jones (2012) state that project risk management process involves establishing risk context and governance, identifying value drivers, identifying risks, assessing risks, developing risks response, assessing risk response and monitoring and reporting.

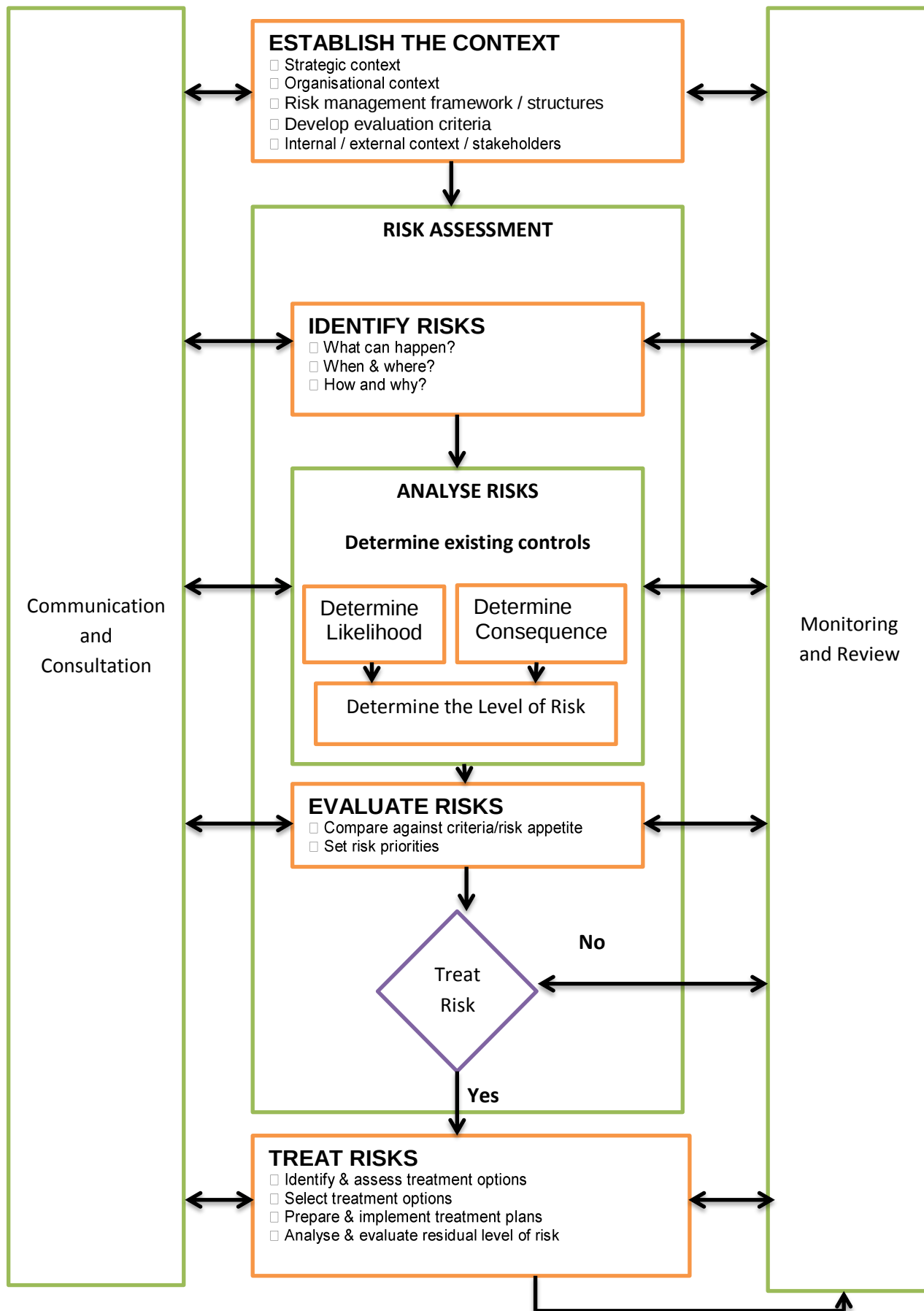


Figure 3.4: Risk management process, (Thompson, 2012).

According to Berg (2010) risk management process is as follows (1) Establishing goal and context; (2) Identifying risks; (3) Analysing the identified risks, (4) Assessing or evaluating the risks, (5) treating or managing risks, (6) Monitoring and reviewing risks and lastly (7) Communication and consulting with stakeholders.

1. Establishing goal and context - Berg (2010); (Chaffey & Wood, 2005:363) states that establishing goal involves the appraisal of the requirements, codes and standards and risk management and business plans of the organisations.

2. Identifying risks - Lew and Jones (2012); (Chaffey & Wood, 2005:363) states that identifying risks involves developing a consistent taxonomy and risk repository and align applicable risks with value strategies, objectives and initiatives. According to P45h Medica (2011) risks should be identified early by suggesting a list of risks that are known and those that are expected, this should be done by team members.

The IRM (2010:5) states that evaluation of risks could be amended by using a risk classification system. Risk classification systems are important as they permit an organisation to find increases of associated threats. Risk classification system will allow the organisation to recognise the type strategies, tactics and operations that are most vulnerable. Risk classification systems cannot be appropriate to all kinds of organisations.

3. Analysing the identified risks - To Berg (2010); (Chaffey & Wood, 2005:363) risk analysis involves analysing problems and things that can cause risk to happen, and also estimate risks that don't have solutions in place.

4. Assessing or evaluating the risks - Lew and Jones (2012) state that assessing risk involves defining assessment criteria based on risk appetite and tolerance and assess relevant risks (Chaffey & Wood, 2005:363).

Table 3.3: Example of a risk matrix Berg (2010).

		Consequences				
Likelihood		1 Insignificant Impact	2 Minor Impact	3 Moderate- Minor Impact	4 Major Impact	5 Catastrophic - Major Impact
1	Rare	Low	Low	Moderate	High	High
2	Unlikely	Low	Low	Moderate	High	Very high
3	Moderate/ possible	Low	Moderate	High	Very high	Very high
4	Likely	Moderate	High	High	Very high	Extreme
5	Almost Certain	Moderate	High	Very high	Extreme	Extreme

5. Treating or managing risks – Berg (2010) states that risks need to be treated and this step develop cost effective possibilities for treating the risks.

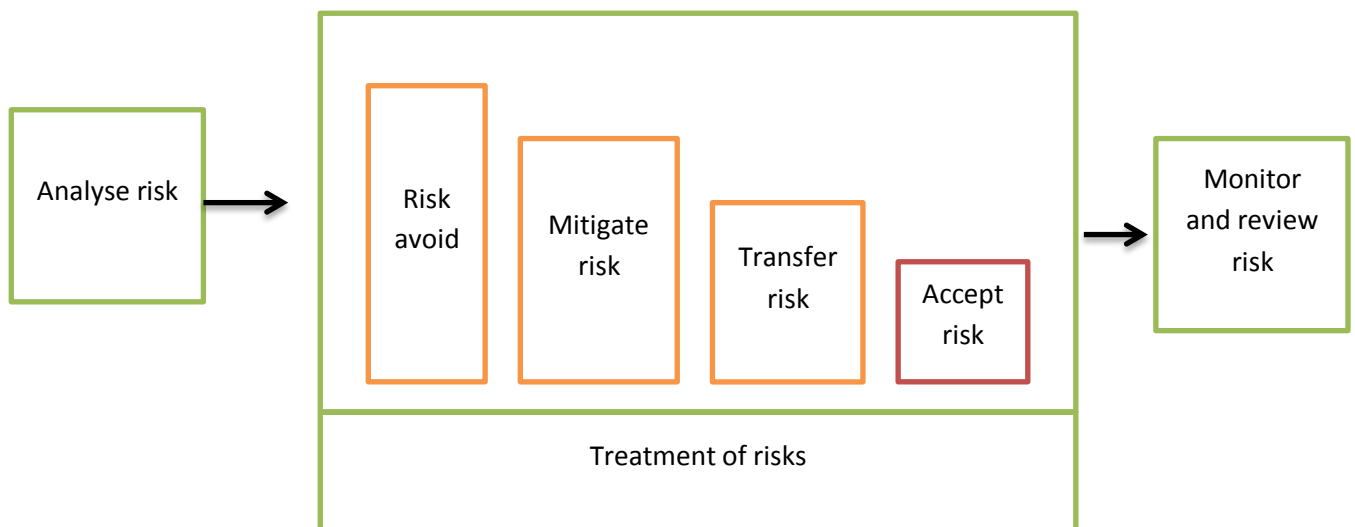


Figure 3.5: Treatment of risks, Berg (2010).

6. Monitoring and reviewing risks - Lew and Jones (2012) state that monitoring risks involves monitoring efficiency of risk response.

7. Communication and consulting with stakeholders – Berg (2010) states that communication is important for risk management process.

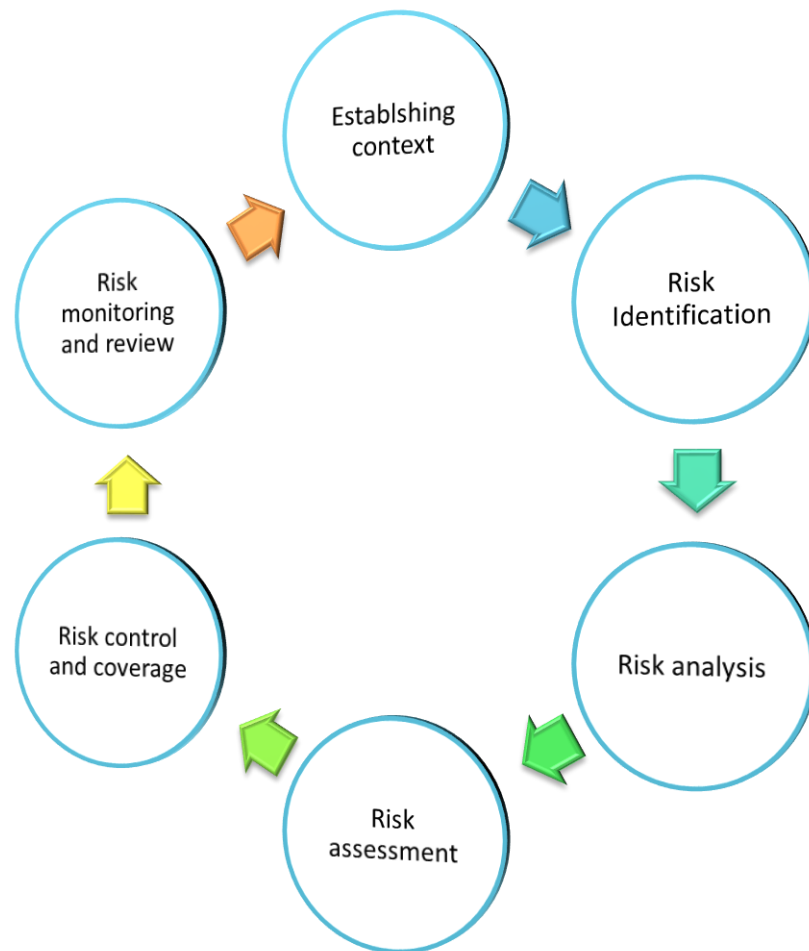


Figure 3.6: Risk management process, Berg (2010).

Risk management can be categorised into four phases from IT perception (Proctor, 2010:2):

- **Strategise and plan** – develop communication and strategic plans, scope, resources, budget and governance systems have to be included. Strategic IT and business plans are involved in IT risk management.
- **Assess current state** – history and culture of the organisation have to be evaluated. Check what is working and what is not working and come up with better strategy.
- **Implement** – manage IT risk management and involve executive to understand the risk acceptance.
- **Operate and evolve** – track risk management and make new business need to adjust to the program.

3.4 CONCLUSION

Organisations are trying to solve their problems involving IT projects. Sadly in doing so they are face high rates of IT projects failure. This chapter explained project management and project management risk which involves risk management processes that can be used to solve failure in information technology projects. This chapter showed examples of risk management matrix that can be used by projects teams or project managers to solve problems or rate risk while working on a project. Looking at risk management IT phases above one can say project leaders need to follow this phases to make sure that project do not fail.

Project management processes can be followed during the project to ensure that threats are treated as soon as possible. Project managers also need skills to make sure that the project they are managing is successful at the end of the day. And the project is considered successful when is completed on time, within budget, and the scope of stakeholders is met. The next chapter focuses on IT project failure.

CHAPTER 4: INFORMATION TECHNOLOGY PROJECTS FAILURE

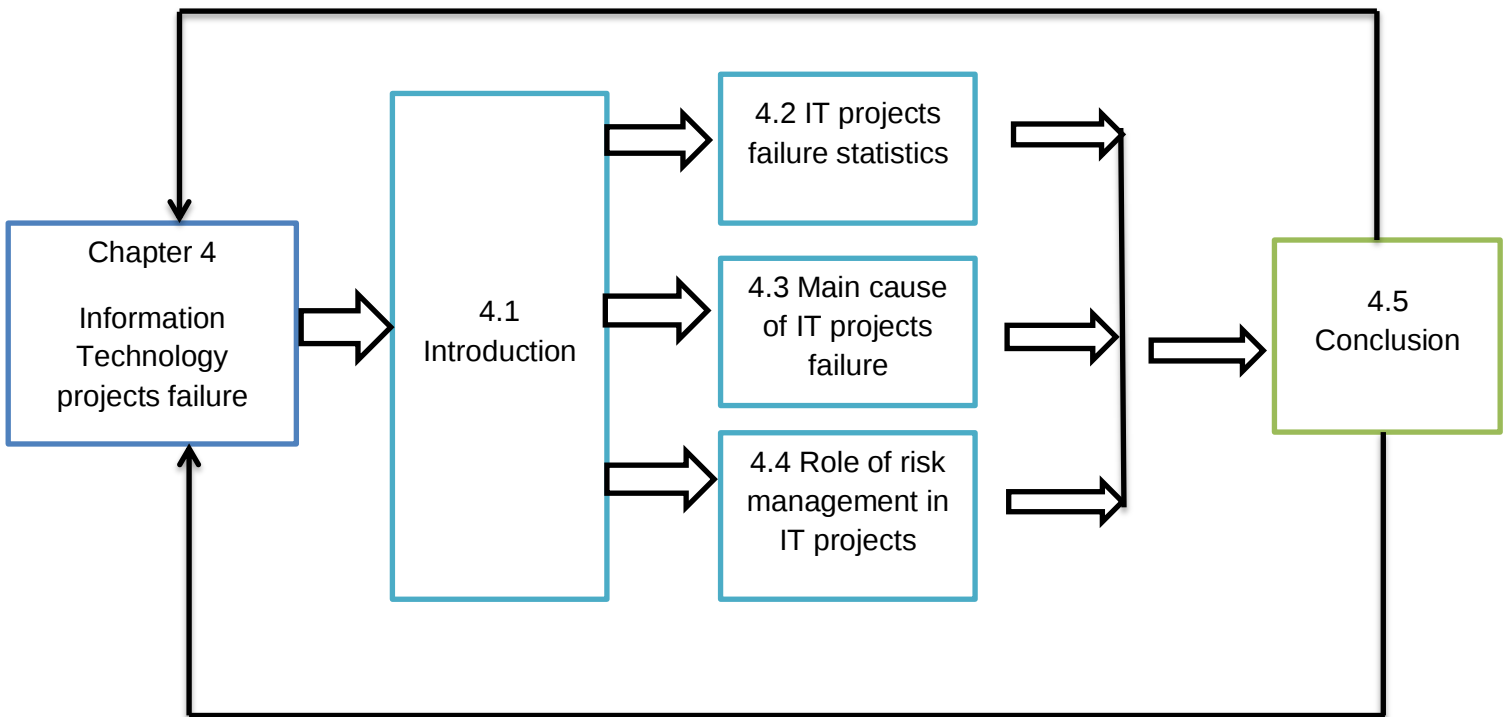


Figure 4.1: Flow of research methodology chapter

4.1 INTRODUCTION

The purpose of this chapter is to discuss and consider the reasons for IT projects failure. Topics to be covered in this chapter includes Information Technology project failure statistics, causes of IT project failure, and the role of risk management in information technology projects failure. The Standish Groups and relevant reports are used to outline the reasons for IT projects failure. Other relevant sources are used to understand the role of risk management in IT projects failure.

In many organisations and companies projects are very important as they are putting more effort in increasing resources in areas such as unique product, improvement of processes or creating new services. Many studies show that some projects do not reach the deadlines, and cost objectives while some fail to meet customers' expectations or companies' expectations (Sauser *et al.*, 2009: 666).

Elwin (2010) presents technology as a very empowering tool in so far as information gathering and distribution is concern. He therefore fails to understand why many projects fail. Statistics show that 74% of all projects do not see the light of day. This is mainly to the fact that most of these projects exceed their budget or fail to meet the deadlines. A total of 90% of IT projects also fail and due to the budgetary constraints and failure to meet deadlines. Successful projects are projects are those that are completed on time, within budget and satisfy the goals of the business or organisation. Projects in information technology that are dropped before their completion date are regarded as failed projects. The ones that are over budget or are completed late are referred to as challenged projects (Kaur and Himanshu, 2013).

Dorsey (2005:2) states that critical features that lead to systems projects success are support from top management, sound methodology and sound project management someone who has extensive technical experience on similar project.

4.2 IT PROJECT FAILURE STATISTICS

Clancy (2014:5) states that successful projects for large companies are only 9% and for small and medium businesses' rate are at 16.2% and 28% respectively successful, while a total of 61.5% of all large company projects were challenged projects as compared to 46.7% for medium businesses and 50.4% for small businesses. A total of 37.1% were projects which were considered impaired and cancelled in medium companies as compared to 29.5% in large companies and 21.6% in small companies. Clancy (2014:5) states that the success rate of IT projects was 16.2% while the challenged projects rate was 52.7% and impaired rate was 31.1%. Ibrahim (2013:87) states that information technology projects are in a chaotic state. Table 4.1 below shows history of this problem.

Table 4.1: IT projects statistics, Ibrahim (2013:87).

Year	1994	1996	1998	2000	2004	2006	2008
Successful %	16	27	26	28	29	35	32
Challenged %	53	33	46	49	53	46	44
Failed %	31	40	28	23	18	19	24

Clancy (2014:5) states that the biggest challenge for projects that face cost and time overruns is the issue of restarts. There are 94 restarts for every 100 projects started. In Table 4.2 and Table 4.3 below Clancy (2014:5) gives the statistics of cost overruns and time overruns.

Table 4.2: Cost overruns Clancy (2014:5).

Cost Overruns (%)	Responses (%)
< 20%	15.5
21 – 50	31.5
51 -100	29.6
101 – 200	10.2
201 – 400	8.8
Over 400	4.4

Table 4.3: Time overruns Clancy (2014:5).

Cost Overruns (%)	Responses (%)
< 20%	13.9
21 – 50	18.3
51 -100	20.0
101 – 200	35.5
201 – 400	11.2
Over 400	1.1

4.3 CAUSES OF IT PROJECT FAILURE

Dorsey (2005:5) states that working back to front in a project is the main cause of project failure even though it is used in an IT environment. The Standish Chaos Report for 2009 revealed that 32 percent of IT projects were successful, 44 percent were challenged and that 24 percent failed (Eveleens & Verhoef, 2010:31).

Gulla (2011) states that IT project failure is caused by various reasons, among them being poor user input, stakeholder conflicts, unclear requirements, poor budget and schedule, lack of skills, failure to plan, lack of communication, poor architecture and late warnings about failure. Gartner (2012) states that smaller project are easier to manage as compared to larger projects. Gartner further states that the rate of IT projects failure has seen a dramatic increase in the last few years. This failure costs affected companies millions as about 50 % of such projects have budget exceeding \$350 000.

Taylor *et al.*, (2002:2) states the following as being among the key reason for IT project failure for:

- **Lack of leadership:** Taylor *et al.*, (2002:2) states that leadership is used to inspire people who are involved in the projects and that it also help to determine the future. They further state that leadership does not always come from the CEO but if the CEO doesn't support a project this may lead to project failure.
- **Lack of clarity:** According to Taylor *et al.*, (2002:4) leadership is all about making sure that clear scope of the project is provided as well as the reasons why the project should take place.
- **Little or no due attentiveness is performed:** Taylor *et al.*, (2002: 5) state that there are always risks for not making a project a success. This could happen if no research has been done on the projects up front.
- **Lack of accountability:** A project is complete when the results are measurable and visible as promised Taylor *et al.*, (2002: 8).
- **Lack of proven process:** Project leaders like to skip certain processes when dealing with projects.

Tilmam and Weinberger (2004) state that project failure can be caused by project team, stakeholders, sponsor and customers however the main causes of project failure are based on project management processes and in making sure that IT is associated with the environments of the affected organization.

Armour (2005:17) states that projects have some points of risks. This makes planning a bit difficult as it is not always possible to do full and accurate calculations on the levels of risk that projects might face. In many instances IT project managers do not set or calculate the risk level when planning their projects. This makes it impossible for them to know the level of risk they are taking on such projects (Armour, 2005:17). IT managers sometimes feel that the projects they are dealing with will not stop growing because of objective changes in the middle of the project (Gross, 2005). Lack of communication within the team causes massive

problems for IT projects because project managers feel that the executives will not require the communication progress (Gross, 2005).

Fichter (2003:43) states that IT projects tend to have problems of scope creep and feature creep. Scope creep occurs when projects have uncontrollable and unexpected changes in stages of the their progression while feature creep occurs when features are added to a system and made uncontrollable while assuming that small change cannot change the budget or the scope of the project. Jenster and Hussey (2005) state that poor support from executives lead to project failure as it becomes difficult for project managers to manage IT projects. According to Gartner (2012) projects were divided into three sizes, namely, small, midsize and large projects (see Figure 4.2 below).

Distribution of Success and Failure across project sizes

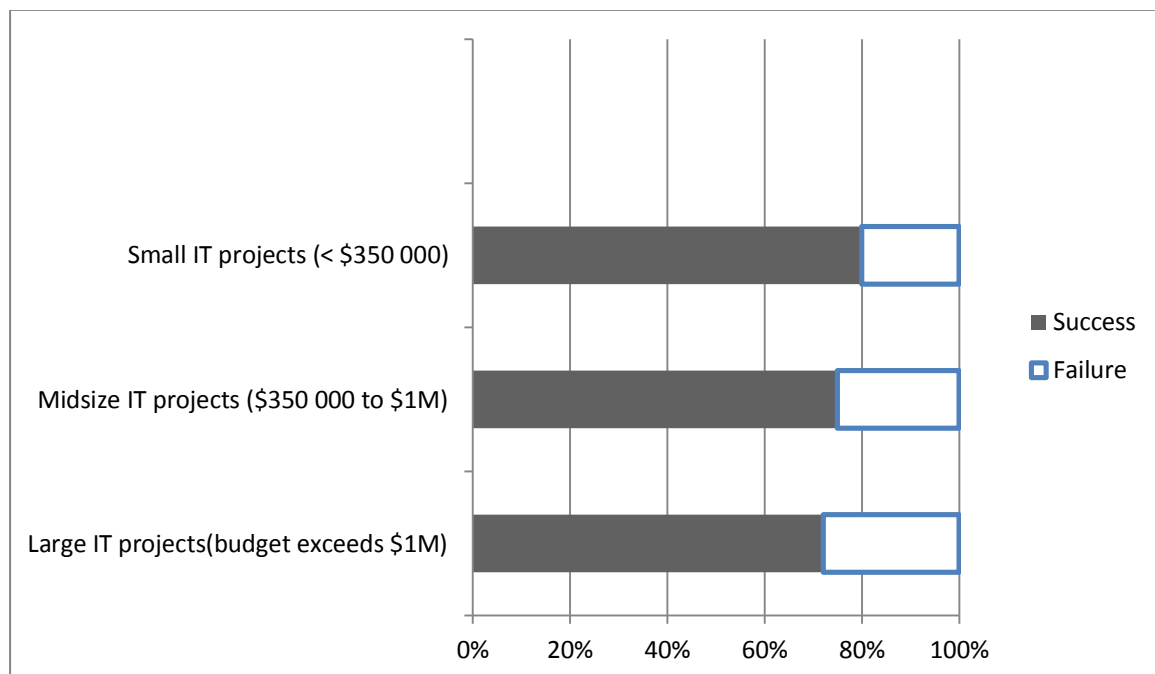


Figure 4.2: Gartner (2012) Distribution of Success and Failure across project sizes.

Figure 4.2 above shows the graph of project sizes as well as their success and failure. Gartner (2012) found out that IT projects that had budget of \$1 million had higher rate of failure than those that had budgets of less than \$350 000. Figure 4.2 above figure shows that small projects success rate of 80% and failure rate of 20%, the midsize projects had a success rate of 75% and a failure rate 25% while large projects had a high failure rate of 28% and a success rate of 72%. Kweku (2005:74) states the following as being among the leading constraints that determine whether at project is a failure or successes are as following:

- Schedule constraints;
- Cost or budget;
- Sponsors requirements;
- User needs and expectations, and
- Quality.

According to Royal Academy of Engineering, and British Computer Society (2004) the projects of public sectors failed at a rate of 84 percent. Habibi *et al.*, (2005) state that in Iran about 64 % of Information system projects were spoilt while 26 % were challenged and 10 % were successful.

Bentley and Whitten (2007) state that the issues that cause Information Technology failures are the following:

- Top management not committed to the project;
- User commitment is lacking;
- Insufficient user participation;
- Desires are unstated;
- Failure to accomplish the anticipation of users;
- Fluctuating scope;
- Inadequate in skills;
- New equipment;
- Scarce Recruitment;
- Lack of organisations' commitment to a systems development methodology;
- Poor assessment procedures;
- Inadequate individuals organisation abilities;
- Failure to adapt to industry adjustments, and
- Failure to accomplish the strategy.

From the preceding literature it is already obvious that tactical alignment, top management obligation, lack of skill, poor knowledge and risk management activities are dangerous features that can lead to failure in any project management environment. Managing IT projects demand that management assess applicable controls for managing the risk in information systems projects (Chaffey & Wood, 2005:336).

Martineau and Shumway (2009) provide a figure that shows projects that were successful, challenged and failed from the year 2004 to the year 2009. It is with high appreciation that success in IT projects is increasing, which may make improvements in management of information technology projects, and considering risk management and change management. Figure 4.3 demonstrate success rate of IT projects, in year 2004 15% of projects were successful, 51% of projects were unsuccessful and 34% of projects were completed with budget being increased and schedule being expanded. In the year 2006 19% percent of projects were successful, 46% of projects were not successful and at least 35% of projects were completed with budget and schedule being increased. In 2009 24% of projects were successful, 44% of projects failed and 32% of projects were completed with schedule and budget increased. Since the year 2004 the success rate of IT projects was increased with of 5% particularly between 2006 and 2009 while in 2006 the difference between 2006 and 2004 was only 4%. This shows that IT project success rate doesn't have much difference comparing to the past years, the failure rate difference was 2% between 2006 and 2009, this shows that IT projects failure does not decrease that much.

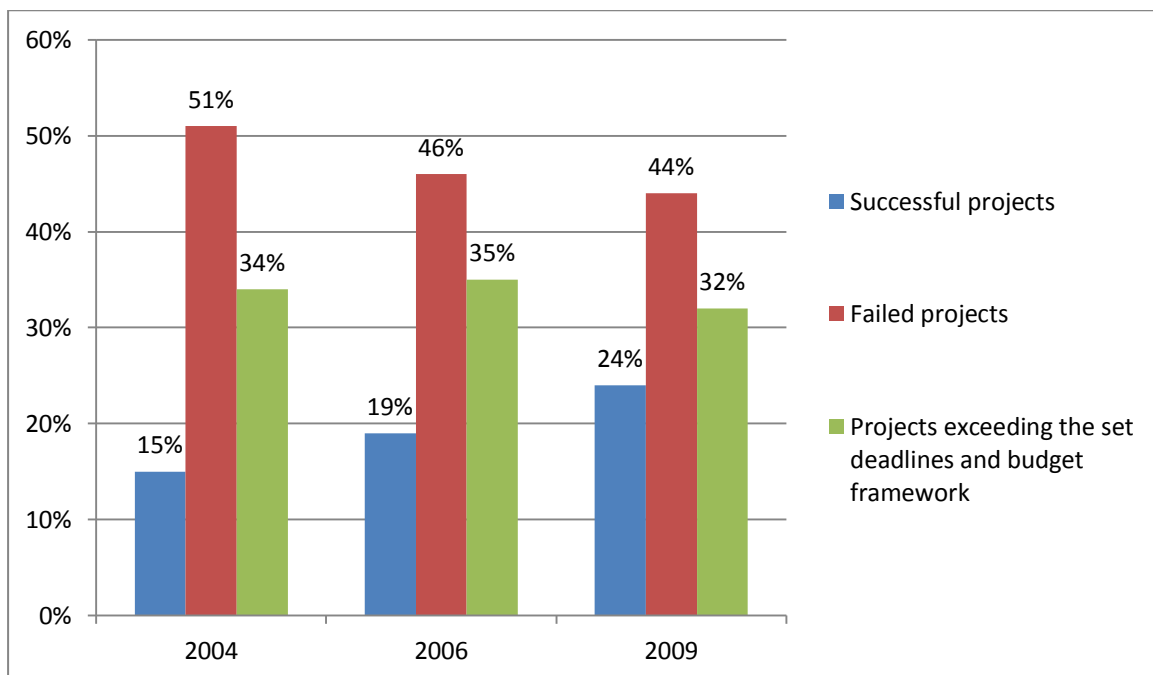


Figure 4.3: Success rate of information system development projects (Martineau and Shumway, 2009).

4.4 ROLE OF RISK MANAGEMENT IN IT PROJECTS

Nehari talet *et al.*, (2014:4) state that in IT one of the utmost essential aims of risk management is to make informatics systems that save, query, or transfer organisational information. This is to be achieved by allowing management to make informed risk management judgments to explain the costs that a portion of an IT budget and by helping supervision in approving the IT systems, on the basis of the supporting documentation resulting from the performance of risk management.

Stoneburner *et al.*, (2002:1) state that risk management is the procedure of detecting risk, of measuring risk and of taking steps to decrease risk to an acceptable level. Elky (2006:1) defines risk management as a procedure of understanding and responding to features that may lead to a disappointment in the accessibility, honesty and privacy of an information system. Elky (2006:1) further lists the following as being the reasons that lead to IT projects failure:

- Not clearly defining the contingency directives and procedures;
- Lack of a clearly defined, tested contingency plan;
- The absence of adequate formal contingency training;
- Lack of material (data and operating system) backups;
- Insufficient information system retrieval actions, for all processing parts (containing networks);
- Not having different processing or storing locations, and
- Not having alternative communiqué facilities.

4.5 CONCLUSION

The chapter provided the information that other authors have documented about IT project failure and the reasons that lead to the failure of the project in the IT environment. IT projects fail at high rates according to Standish group. Project status can be classified into successful, challenged and impaired. This further gives statistics indicating that not 100% of IT projects get successful.

The next chapter will analyse the findings. The researcher herein also provides a thorough description of the findings about the role of risk management in IT project failure.

CHAPTER 5: RESULTS AND FINDINGS

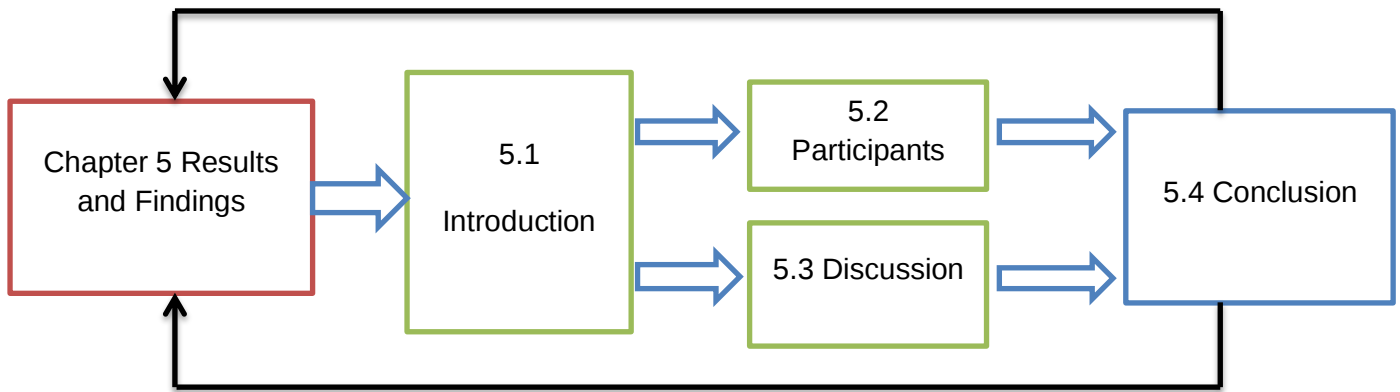


Figure 5.1: Research results and findings.

5.1 INTRODUCTION

Chapter 2 discussed the methodology used in this study namely the quantitative research methodology. This chapter focuses on the outcomes of the empirical study. This chapter is outlined as follows, 5.1) Introduction, 5.2) Participants, 5.3) Discussion and 5.4) Conclusion.

5.2 PARTICIPANTS

Due to the fact that a quantitative research method was used in this study it is important to outline the role played by all the selected participants.

5.2.1 Quantitative research participants

As stated in chapter 2 the target population for this study involved not more than 150 individuals who were selected to participate in the study. Therefore, the survey research questions was sent to 76 individuals including the IT project managers, students who are studying project management as part of their module as well as to graduates with IT qualification working on different IT projects. The participants were of different genders since

the study is not gender based. An online survey was developed using software called surveymonkey which consist of different questions that are shown in appendix B. Only 47 individuals managed to take the survey and return the results to the researcher. A consent form was sent to all the participants. Interviews were also conducted with 6 participants to gather more data for the study. All interviewed participants were closely observed when answering the interview questions.

5.2.2 Analysis of data

- **Data preparation for examination**

Results were obtained from the participants and the planning was done. The scale of measurement used for this study was nominal and interval. Table 5.1 below shows how data was coded in SPSS; the numbers were used as values that represent an the options the participant need to choose from. Coding of the responses what specified according to individual question, question1 coding documentation is explained in the Table below and for all the questions the following documentation was used and documentation differs according to the question asked. All the values range from 1 ending by different values, since some of the questions had three options to choose from others had 4 options to choose from.

Table 5.1: Scale of measurement documentation

Question Number		Responses	Codes
Question 1	What type of company are you working for?	Private company	1
		Non-profit organization	2
		Government or public sector	3
		Charity	4
		Other company	5
		Not answered	6

- **Quality check of data**

Data was checked for errors using SPSS, missing data refers to questions that respondents did not try to answer and data of answered questions from participants was regarded as valid data. There three types of scales of measurement for statistical data and are as follows:

- Interval data – are data with numeric for example, temperature.
- Nominal data – are data that has a meaning for example, work profession, country of origin.
- Ordinal data – are data that scale from 0 to 5 according to the importance of answer chosen.

5.2.3 Validity and reliability assessment

Validity refers to the truthfulness or the degree to which a test honestly characterises an idea, and if the quantity actually measures what it is must measure (Zikmund & Babin, 2013:258). The types of validity are as follows:

- Criterion-related validity - evaluates the success of the measure attribute to make prediction of the respondents (Malhotra, 2010:320; Zikmund & Babin, 2013:259).
- Content validity - is a subjective but methodical evaluation of how fine the content of a scale characterises the quantity task (Malhotra, 2010:320).
- Construct validity - involves the individuals or create essential measure by the scale (Malhotra, 2010:320).

Validity of this study was measured with content validity and construct validity.

5.3 DISCUSSION

5.3.1 Research findings and their relevance

5.3.1.1 Results from data collection method (Quantitative research design)

76 individuals were asked to take part on this data collection method, and only 47 individuals participated. The participants have knowledge and skills in IT projects. All the individuals who participated in the study signed the consent form (Appendix A). Only 6 participants were

asked to do the interview questions (Appendix D) and the participants were observed (Appendix C) during the interview session to trace their body language and eye-contact while answering the interview questions.

There are various reasons that led to the total number of responses given above. Some of those reasons could be that:

- Some individuals felt that they did not have enough time to participate in the study.
- Some individuals were too busy and as such forgot to participate in the study.
- Some could have felt that the questions were not so relevant to their work environment.

In Figure 2.3 of elements of the research process Gray (2004:35) shows that positivism paradigm can use several methods for data collection. Such methods could include sampling, secondary data, observation, interviews, questionnaire, unobtrusive and measures. For the purpose of this study observation, interview and survey data collection methods were used to collect data.

1. Interview questions (Appendix D)

Interview sessions were conducted with only 6 participants who took part in the study. This was mainly to gather information about the role of risk management in reducing IT projects failure.

The following questions were asked during the one-on-one interview sessions:

- How do you define project failure?
- What do you think about risk management in project management?
- Is risk management in project management better way to reduce information technology failure?
- Do you think projects need a project manager?
- What measures do you use to describe project failure?

Interview session results:

Table 5.2: Interview session results

Questions	Frequency of respondents	Percentage
Question 1: Definition of project failure - Not satisfying scope, not delivered on time, exceeded budget, they say project failure can be check based on time, scope and budget. - Project that was delivered on time with the scope being reduced but didn't exceed the budget Combination answers of respondents.	4 2 6	67% 33% 100%
Question 2: risk management in project management - Assists on identifying the risks projects might encounter at a later stage of the project, and those risks need to be mitigated. - Something that need to be identified and managed. Combination answers of respondents.	5 1 6	83% 17% 100%
Question 3: Is risk management in project management better way to		

reduce information technology failure. • Yes • No Combination answers of respondents.	6 0 6	100% 0% 100%
Question 4: Do you think projects need a project manager. • Yes, projects need someone who will manage them whether it is a small project or big project. • No Combination answers of respondents.	6 0 6	100% 0% 100%
Question 5: Measures you use to describe project failure. • Quality, time, cost and scope. • Project failure is measured using scope; they say time can be increased and costs can be increased as long as the scope of the project is met. Combination answers of respondents.	3 3 6	50% 50% 100%
Conclusion: The questions asked were based on understanding the role of project risk management to reduce IT projects failure. The above results concludes that risk management is essential in IT projects and the need for a project manager who will ensure that everything is goes as planned, irrespective of whether the project is small or large. It was also found that factors		

that one can consider when determining aspects that causes IT project failure are time, scope and budget.

Projects are affected by risks and as such risk management project need to be considered to identify risks and mitigate those risks as to ensure that projects are not adversely affected.

2. Observation (Appendix C)

During the interview sessions the participants were notified that they will be observed based on their eye-contact and body language while answering the interview questions. The participants were having a one on one observation session. They were given a chair so that they are comfortable. The outcomes were recorded on the observation form (Appendix C).

The outcomes of the observation session are as follows:

Table 5.3: Observation session results

Observation	Frequency	Percentage
Focus: Paying attention to questions asked		
• Paying attention	4	33%
• Not paying attention	2	67%
No. of participants chosen		
• Participated	6	100%
• Not participated	0	0%
Eye-contact: making eye contact with the interviewer.		
• Making eye-contact	5	83%
• Not making eye-contact	1	17%
Body language		
• Correct body language	4	67%
• Wrong body language	2	33%
Views on observation: satisfaction about how observation was conducted		

• Satisfied	6	100%
• Not satisfied	0	0%
Conclusion: The interviewees were satisfied about how the interview sessions were conducted and most of them were not distracted by being observed by the researcher. They managed to focus on the relevant topic, pay attention, make eye-contact and to contribute freely through the interview sessions.		

3. Survey Questions (Appendix B)

Design of survey and interview questions

The interview questions and survey questions were developed using the following technique:

- The research objectives of the study were established, and they were categorised into the parts which were primary research objective, theoretical research objective and empirical research objective.
- Based on the research objectives that are stated in chapter 1 of the study the research questions were determined to answer the research objectives. The research interview and survey questions were developed to acquire information to support research objectives.
- The surveymonkey from (<https://www.surveymonkey.com/>) was used to develop survey questions online. Using the online tool was very useful as it was fast to send the participants the link via emails and text messages. The interview questions were typed using Microsoft word 2010; this was useful because it prevented the typing syntax errors.

The survey questions were divided into two sections and they are explained as follows:

3.1. Section 1: Questionnaire on organization and background

The aim of section 1 was to get an idea of what type of an organisation each participant work for, and how many IT projects they were involved in and also to establish if stakeholders were given full support while busy working on these IT projects. The number of years they

worked on projects was also required to get to know the level of understanding of participants in the IT fields.

3.2. Section 2: risk management in project management to manage failure in IT projects

The aim section 2 was to understand the role of risk management in IT projects and find out what participants believe is the major cause of IT projects failure. The second aim of section 2 was for the researcher understands the factors that IT people think lead to failure of projects in the IT field.

Table 5.4 below shows the total number of survey questions that was sent to the participants.

Table 5.4: Total of survey questions per section

Section	Total of questions per section
1	5
2	3
Total Number Of Questions	8

The survey was sent to 76 individuals' online using survey-monkey. A total of 47 participants took part in the survey study. The results of the survey are analysed as follows:

Section 1 Questions

The frequency (Table 5.5 below) shows a list of participants that are in the variable sample and number of times each participant appear. The bar graphs show the number of respondents in percentages that each value has. Pareto analysis is used to show the support from largest to lowest. Below are frequency Tables, Bar graphs and Pareto analysis graphs for section 1 of the survey. The variables attained in the study are Company type, Roles, Experience, Team size and Stakeholders support. Values were used for each question of Section 1 of the survey and they started from 1 to a specific number that is determined by number of options the participants have to select an answer from.

Question 1: What type the company?

Table 5.5 below shows the responses to question 1. A total of 22 (46.8%) participants are working for private company, 21 (44.7%) are working for government or public sectors, 1 (2.1%) participant is working for Non-profit organisation, 2 (4.3%) participants are working at

other companies, none of the participants are working for charity organisations and 1 (2.1%) did not answer the question.

Table 5.5: Responses of participants on type of company

	Frequency	Percentage
Non-profit organisation	1	2.1
Other company	2	4.3
Government or public sector	21	44.7
Private company	22	46.8
Not answered	1	2.1
Total	47	100

Figure 5.2 below displays the percentages of respondents' companies excluding the one participant who skipped the question. Non-profit organisation is 2.17%, other company is 4.35%, government or public sector is 45.65% and private company is 47.83. Private company and government have high number of people working for them in IT projects. Charity organisation, non-profit organisation and other companies do not have a large number of respondents who work for them.

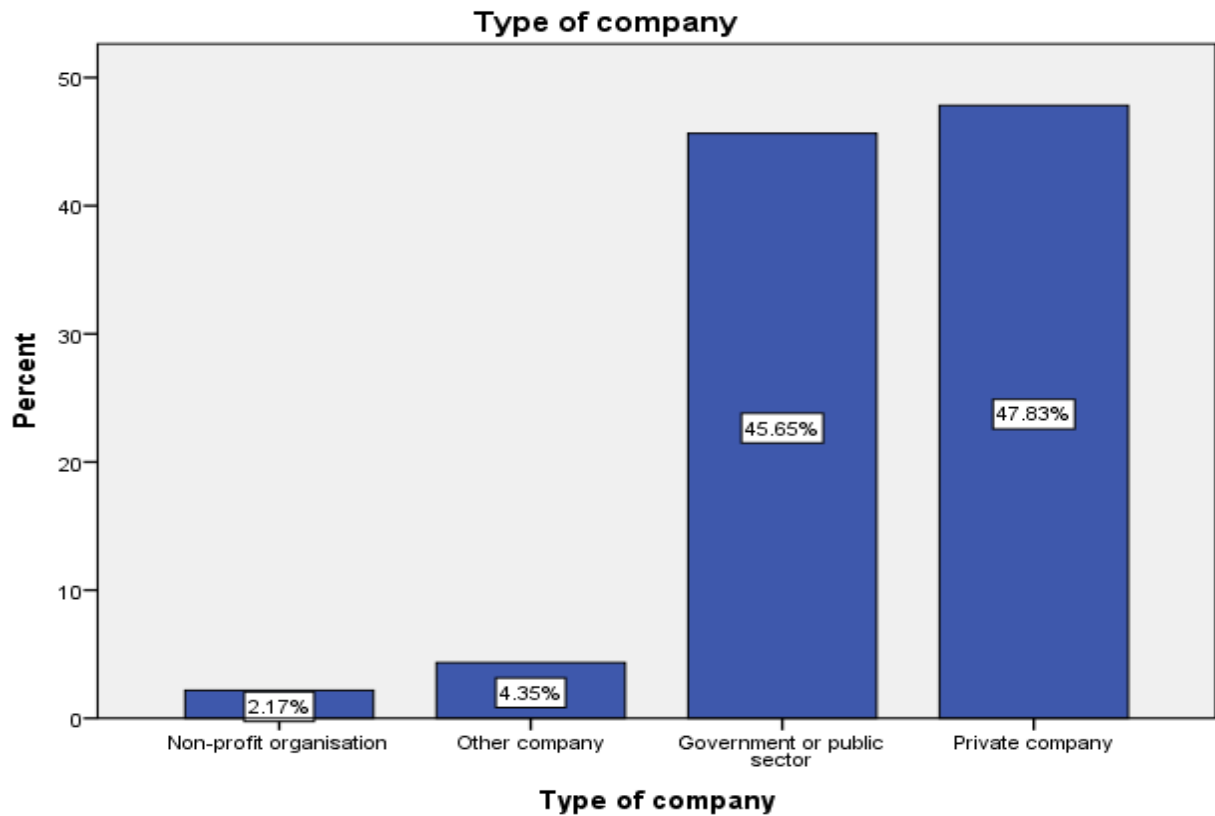


Figure 5.2: Company type respondents' percentages

Question 2: The role of participant in the project

Table 5.6 below shows the responses to question 2. A total of 6 (12.8%) of the participants are project managers, 10 (21.3%) of the participants are team users, 1 (2.1%) is a project sponsor, 28 (59.6%) of the participants are project team members, 1 (2.1%) is on top management and 1 (2.1%) participant did not answer the question.

Table 5.6: Role of participants in the project

	Frequency	Percentage
Project Sponsor	1	2.1
Top Management	1	2.1
Project Manager	6	12.8
Team User	10	21.3
Project Team member	28	59.6
Not answered	1	2.1
Total	47	100

Figure 5.3 below shows the role of respondents in the project excluding the one participant who did not answer this question. The percentages of top management and project sponsor are 2.17%, project manager is 13.04%, team user is 21.74% and project team member is 60.87%. Based on the results many respondents are project team members and smaller numbers of respondents are project sponsor and top management position.

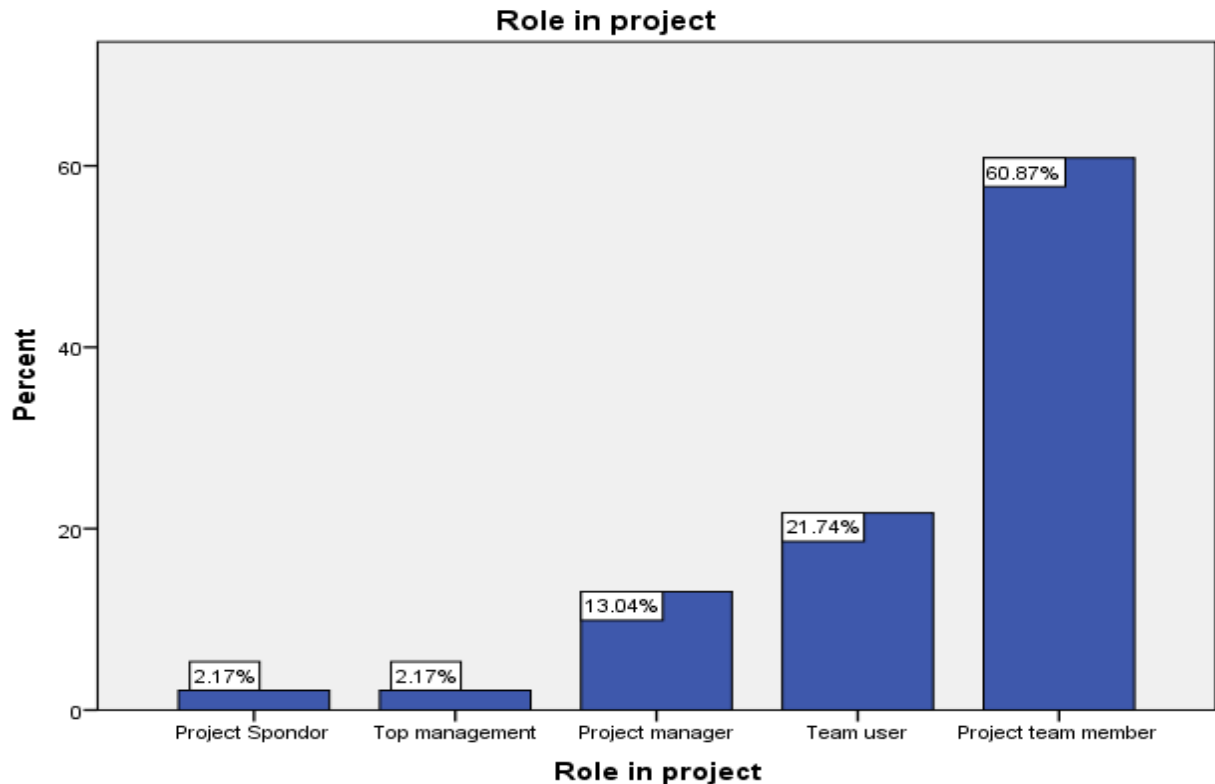


Figure 5.3: Roles of participants

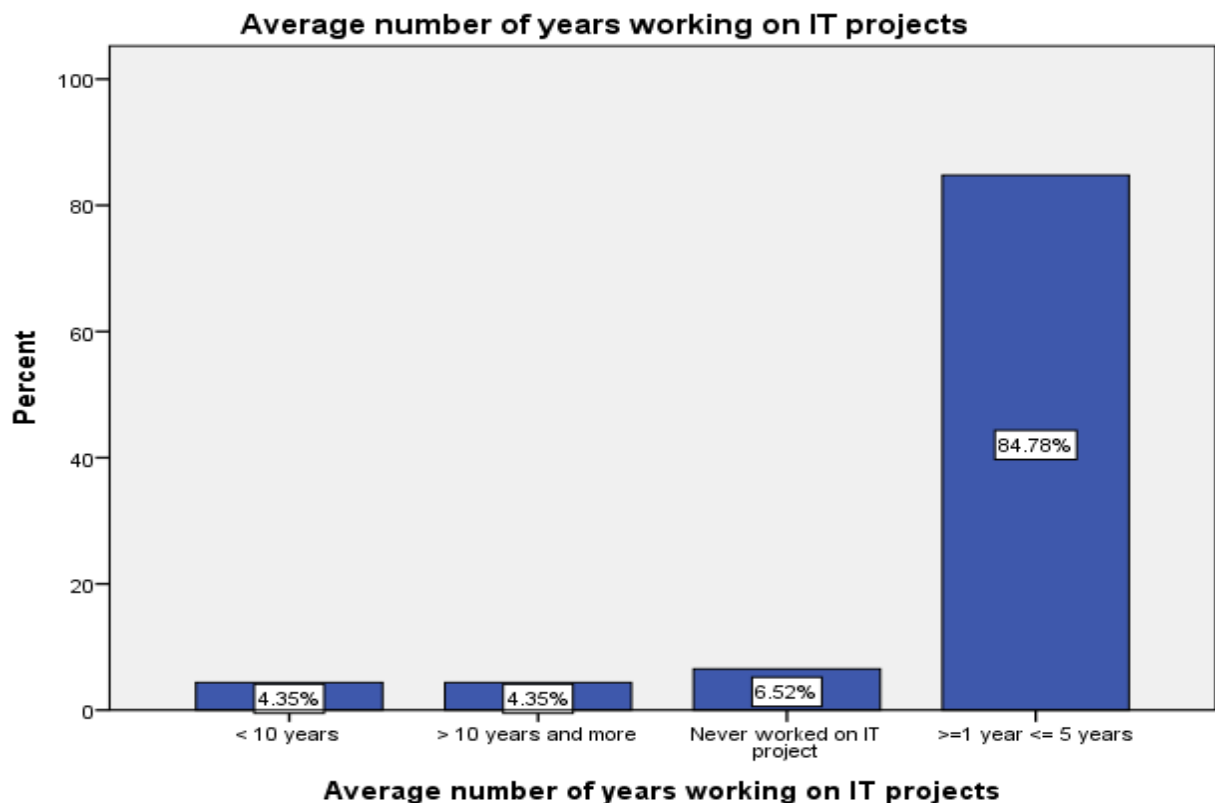
Question 3: Average number of experience working on the project

Table 5.7 below shows the responses to question 3. A total of 2 (4.3%) have less than 10 year experience working in IT projects, 2 (4.3%) of the participants have more than 10 years of experience working on IT projects, 3 (6.4%) have never worked on IT projects, 39 (83.0%) participants have less than 5 years working on IT projects and 1 (2.1%) did not answer this question.

Table 5.7: Experience working on the project

	Frequency	Percentage
Less than 10 years	2	4.3
More than 10 years and more	2	4.3
Never worked on IT project	3	6.4
Less than 5 years	39	83.0
Not answered	1	2.1
Total	47	100

Figure 5.4 below shows the number of years the participants have been working on IT projects, excluding the 1 (2.1%) who participant did not answer this question. The percentage of respondents who worked on IT projects for less than 10 years is 4.35%, more than 10 years and more is 4.35%, never worked on projects is 6.52% and less than 5 years is 84.78%. Many respondents who worked on IT projects have less than 5 years of experience in that field.

**Figure 5.4:** Average number of years working in a project

Question 4: Team size

Table 5.8 below shows the responses of question 4. A total of 3 (6.4%) have more than 50 people in the team, 5 (10.6%) have more than 25 people but not more than 50 people in the team, 14 (29.8%) have more than 10 people but less than 25 people in the team, and 25 (53.2%) have more than 1 person and less than 10 people in the team.

Table 5.8: Number of people in a team

	Frequency	Percentage
More than 50 people	3	6.4
More than 25 people and not more than 50 people	5	10.6
more than 10 people but less than 25 people	14	29.8
less than 10 people	25	53.2
Total	47	100

Figure 5.5 below shows the number of people involved in the project from lower to higher and the results shows that the team with more than 50 team members has a lower percentage while the team with less than ten people has a higher percentage.

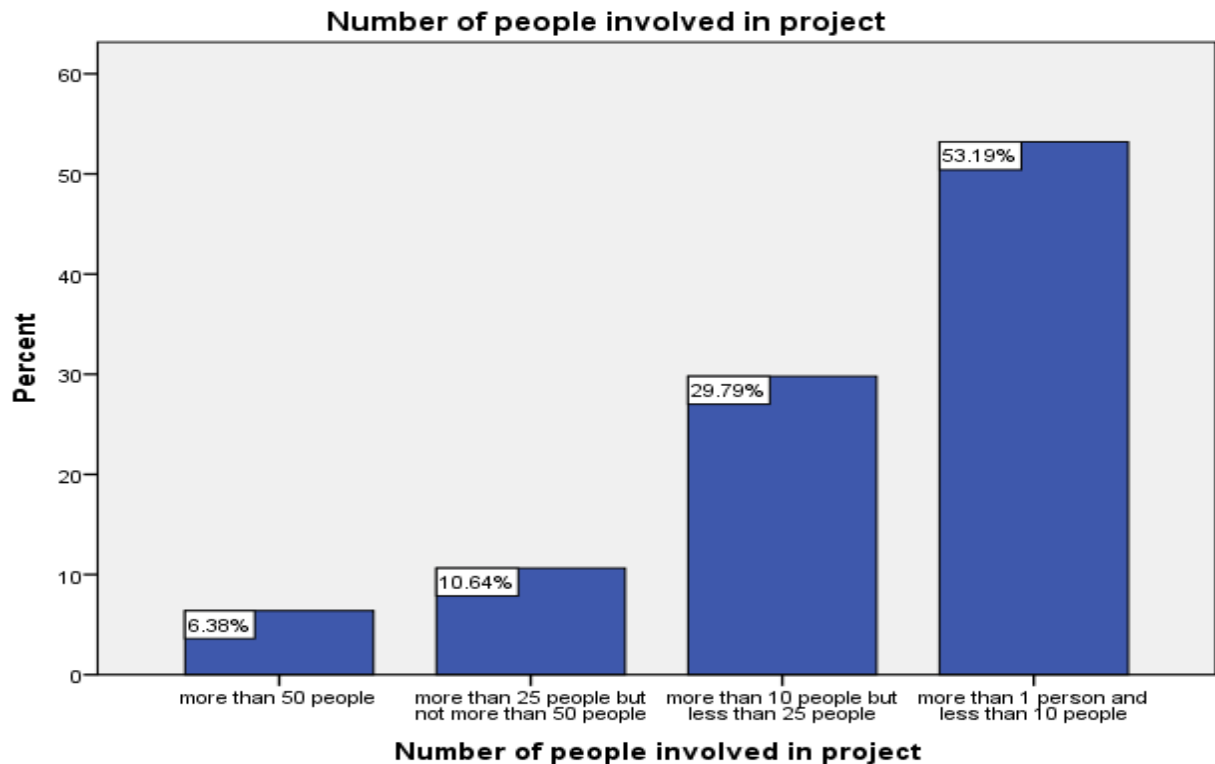


Figure 5.5: Number of people involved in the project

Question 5: Stakeholders support in IT projects

Table 5.9 below shows the responses to question 5. A total of 39 (83.0%) of the participants agree that stakeholders have full support on IT projects, 2 (4.3%) of participants they don't agree that stakeholders provide full support to IT projects, 5 (10.6%) of the participants they don't think IT projects are given full support from the stakeholders and 1 (2.1%) did not try to answer this question.

Table 5.9: Stakeholders support in IT projects

	Frequency	Percentage
No	2	4.3
Reason	5	10.6
Yes	39	83.0
Not answered	1	2.1
Total	47	100

Figure 5.6 below shows stakeholders' involvement in the team. A total of 4.35% said no stakeholders' involvement in the projects, 10.87% provided the reason for stakeholders not being part of the project, and 84.78% said stakeholders is involved in the project. This shows that the stakeholders have support to their IT projects.

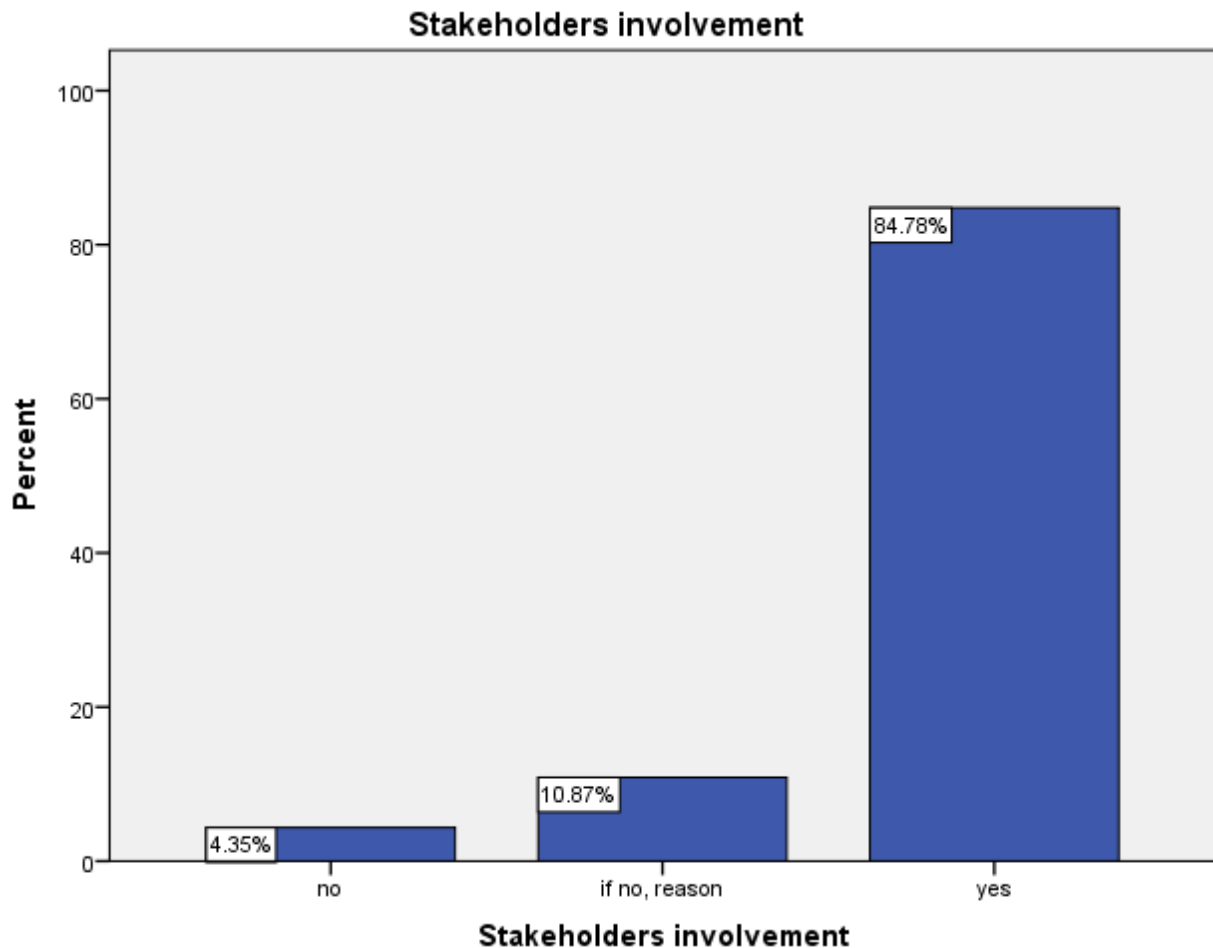


Figure 5.6: Stakeholders involvement

Discussion of variables for question 1 to question 5

Frequency Tables discuss section 1 questions of the survey. Table 5.10 and Table 5.12 show column 1 that contain values of variables and column 2 includes frequency and column 3 includes percentages.

Types of companies: Variation between types of companies is high, government/public sector and private company is 2.1% which is not very high, and the difference between private company and non-profit organisation is 44.7%. This shows that private companies and the private sector in general is where many companies involved in IT projects are found.

Roles of participants: The difference between the roles of participants in IT projects is large. Table 5.6 shows that many of the participants are project team members, followed by team users with the difference of 38.3%. Project sponsor and top management percentages are sitting at 2.1%. This shows that IT projects are done mostly by team members and top management while sponsor lacks support on IT projects which is a high risk for any project.

Experience working on IT projects: Table 5.7 shows that most people who are working on IT projects have less than 5 years of experience with percentage of 83.0%. There is a lack of people with many years of experience in this area, Table further shows that 4.3% of people have more than 10 years of experience in IT projects. There is lack of knowledge and skills in the IT projects environment.

Number of team members: There is a large difference between less than 10 people in the team and more than 50 people in the team. This difference is at 46.8%. This shows that many IT projects team have fewer resources. The rates of IT project failure revealed that IT projects are failing. This happens because of lack of resources.

Stakeholders support: Table 5.9 shows that stakeholders do give support to their IT projects, the difference between yes and no responses is at 78.7%.

For questions 6 to 8 individuals were selecting more than one answer in each of these questions.

Question 6: Factors to consider avoiding IT projects failure

Table 5.10 below shows the responses of question 6. A total of 22 (46.8%) say project risk management is a factor to consider in avoiding IT projects failure, 37 (78.7%) say understanding the scope of the project to have appropriate planning, 6 (12.8%) of participants say making use of your own rules will avoid IT project failure, and 19 (40.4%) of the participants say factors that can avoid IT project failure are costs and schedule.

Table 5.10: Factors to consider to avoid IT projects failure

	Frequency (responses)	Frequency (did not answer)	Total	Percentage %
Make use of your own rules that you	6	41	47	100

have been using to manage project				
Understanding the scope of the project to have appropriate planning	37	10	47	100
Look at project cost and schedule	19	28	47	100
Project risk management	22	25	47	100

Question 7: Defining project failure

Table 5.11 below shows the responses of question 7. A total of 36 (76.6%) of participants define project failure as a project that was not delivered on time, exceeded budget and not meeting the requirements, 26 (55.3%) define project failure as project that did not meet the project objectives and 8 (17.0%) of participants define project failure as a project completed with scope being reduced and resources being added to complete the project.

Table 5.11: Defining project failure

	Frequency (responses)	Frequency (did not answer)	Total	Percentage %
Not met all the objectives of the project	26	21	47	100
Project completed with scope reduced and addition of resources	8	39	47	100
Project not delivered on time, exceeded budget or not meeting the scope	36	11	47	100

Question 8: Factors causing project failure

Table 5.12 below shows the responses of question 8. A total of 17 (36.2%) participants say management commitment causes IT project failure, 30 (63.8%) say assuming to understand the scope of the project lead to project failure, 26 (55.3%) participants say less time to complete project and lack of required resources cause IT project failure, 20 (42.6%) say lack of participation of project members lead to project failure, and 27 (57.4%) say lack of knowledge and experience cause project failure.

Table 5.12: Factors causing project failure

	Frequency (responses)	Frequency (did not answer)	Total	Percentage %
Management commitment	17	30	47	100
Assuming to understand the scope of the project	30	17	47	100
Less time and lack of resources	26	21	47	100
Participation of individual project members	20	27	47	100
Lack of knowledge and experience	27	20	47	100

Discussion of variables for question 6 to question 8

Frequency Tables discuss section 2 questions of a survey. In Table 5.10 to Table 5.12 the frequency show column 1 that contain values of variables and column 2 includes frequency and column 3 includes percentages.

Factors to consider to avoid IT projects failure: Table 5.10 shows that 37 (78.7%) of participants see the scope as an essential factor to look at and understand it in order to have proper planning to reduce IT project failure. 22 (46.8%) of the participants chose project risk management as a factor to avoid. Project risk management, costs and schedule are also the factors to avoid having a success in IT projects.

Defining IT project failure: 36 (76.6%) say that project failure is a project that is not delivered on time, exceeded budget, or did not meet the scope of project. Then 26 (55.3%) define project failure as a project that did not meet all the objectives of the project.

Factors causing IT project failure: Most participants say factors that lead to IT project failure are assuming to understand the scope, lack of management commitment, less time and lack of resources, participation of individuals and lack of experience.

Pareto analysis

Question1: Pareto analysis for question1. Figure 5.7 below shows the most two types of organisations that implement IT projects. These companies are private company and government or public sector, with the frequency of 22 for private company and 21 for government.

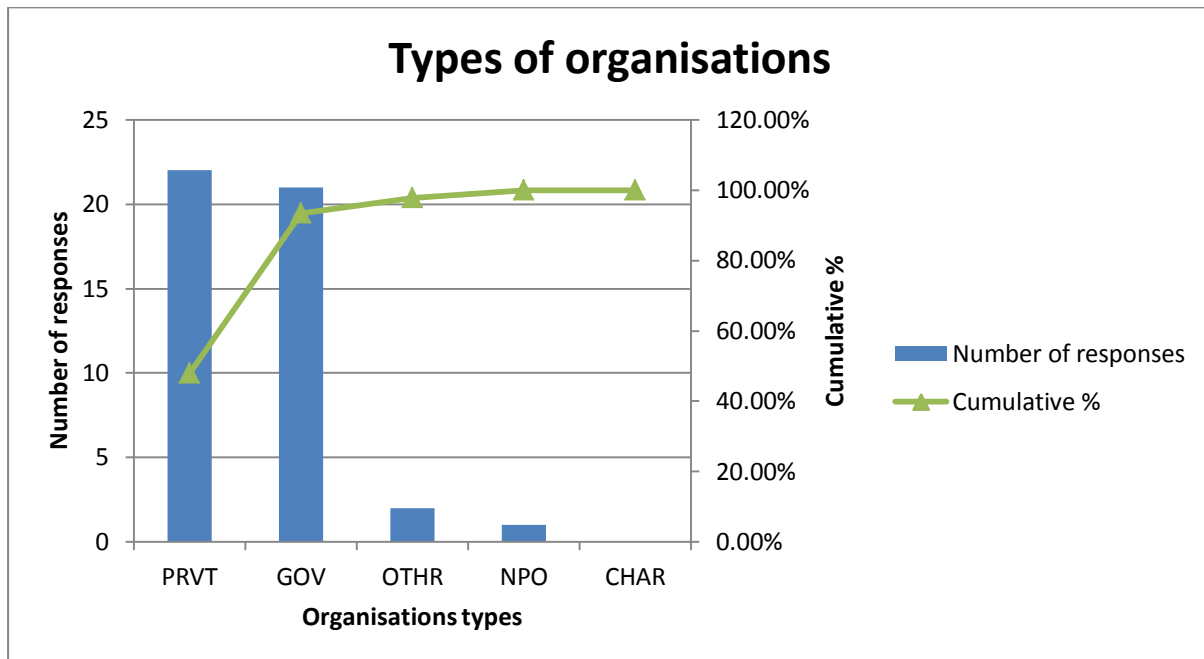


Figure 5.7: Pareto analysis for types of company

Question2: Pareto analysis for question2. Figure 5.8 shows that the most frequent participants' roles in IT projects are team members and team use with the frequency of 28 for project team members and 10 for team user. This implies that about 60% of people who work in IT projects are team members and team users, and 40% are having different positions in IT projects.

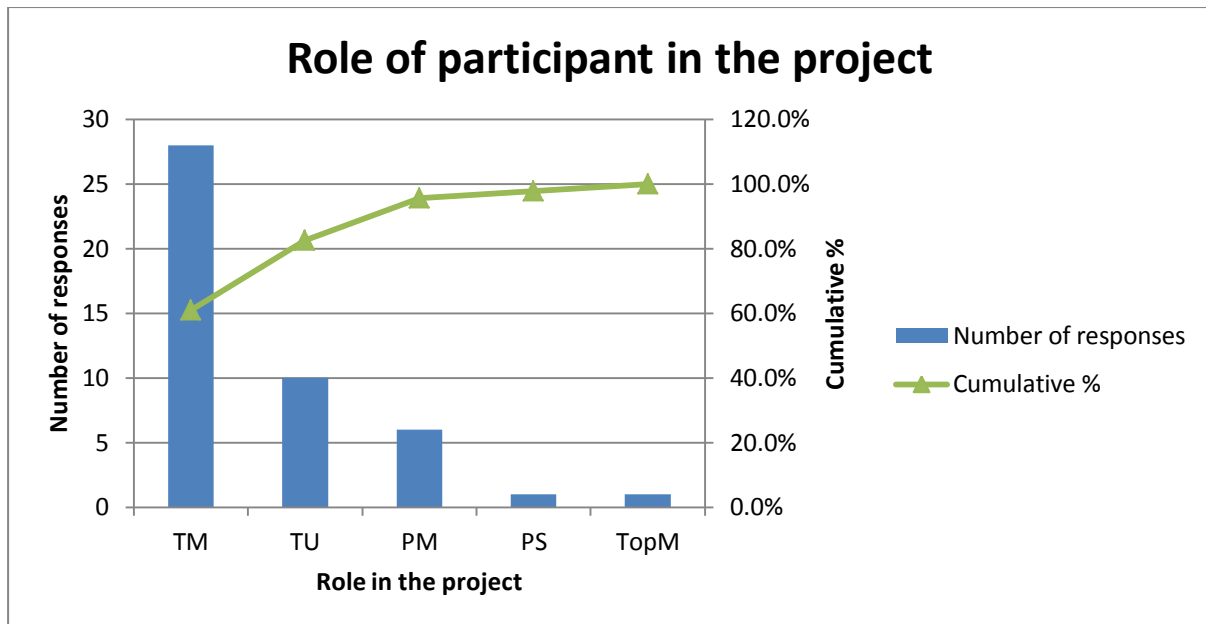


Figure 5.8: Pareto analysis of roles of participants

Question3: Pareto analysis for question3. Figure 5.9 below shows that the most two frequent years of experience for participants is 39 for less than five years of experience and 3 for less than one year of experience. This shows that 82% of respondents have less than 5 years of experience in IT projects environment and 18% have more experience in IT projects environment.

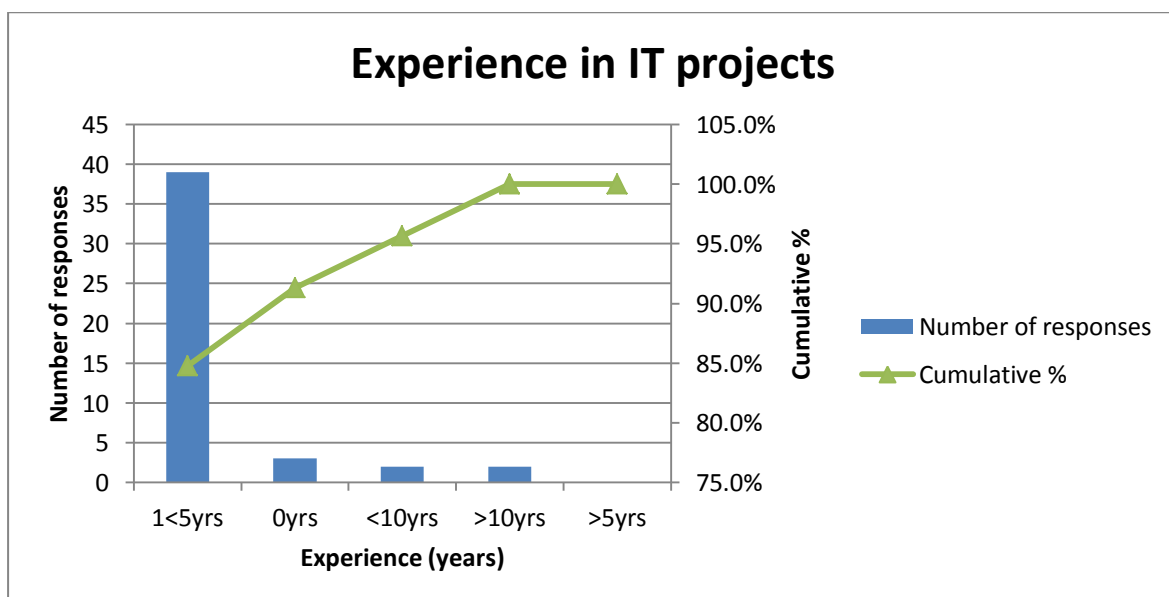
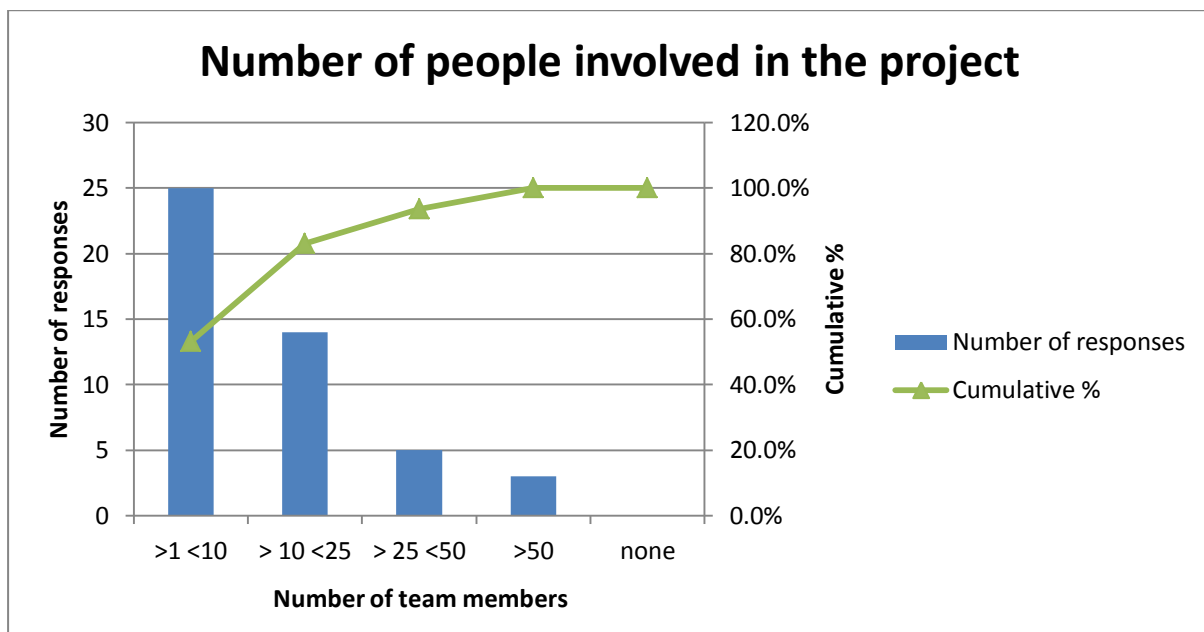


Figure 5.9: Pareto analysis of experience of participants

Question4: Pareto analysis for question4. Figure 5.10 below show that less than 10 people in a team and less than 25 people in a team are the most two frequent classes with the frequency of 25 for less than ten people per team and fourteen from 10 for less than 25 people per team. This shows that 80% of participants were involved in IT projects that consist of less than 25 people and 20% of participants were involved in IT projects that have more than 25 people.

**Figure 5.10:** Pareto analysis of number of team members

Question5: Pareto analysis for question5. Figure 5.11below shows that the most frequent class that for participants who answered yes with frequency of 39. This shows that 83% IT projects stakeholders are involved in IT projects and 17% of stakeholders are not playing a big part in IT projects.

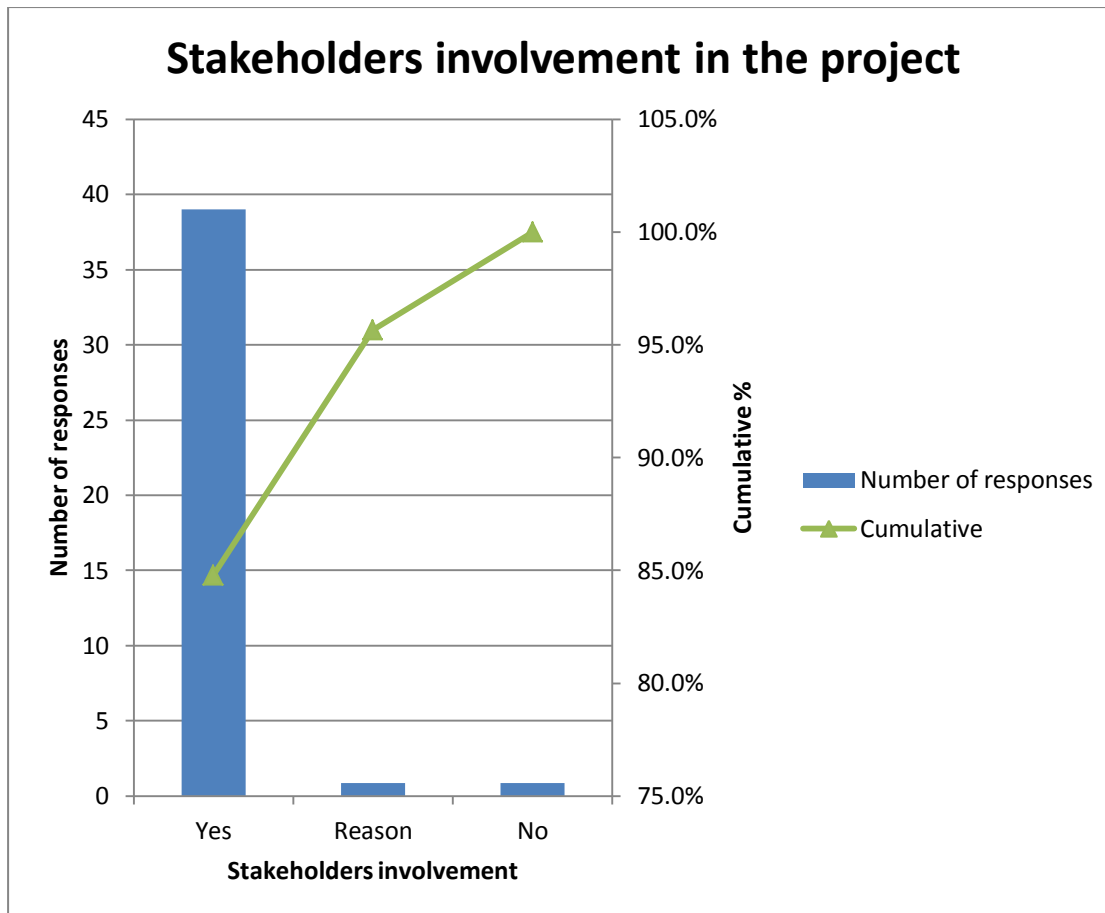


Figure 5.11: Pareto analysis of stakeholders involvement

5.3.2 Correlation of results and literature study

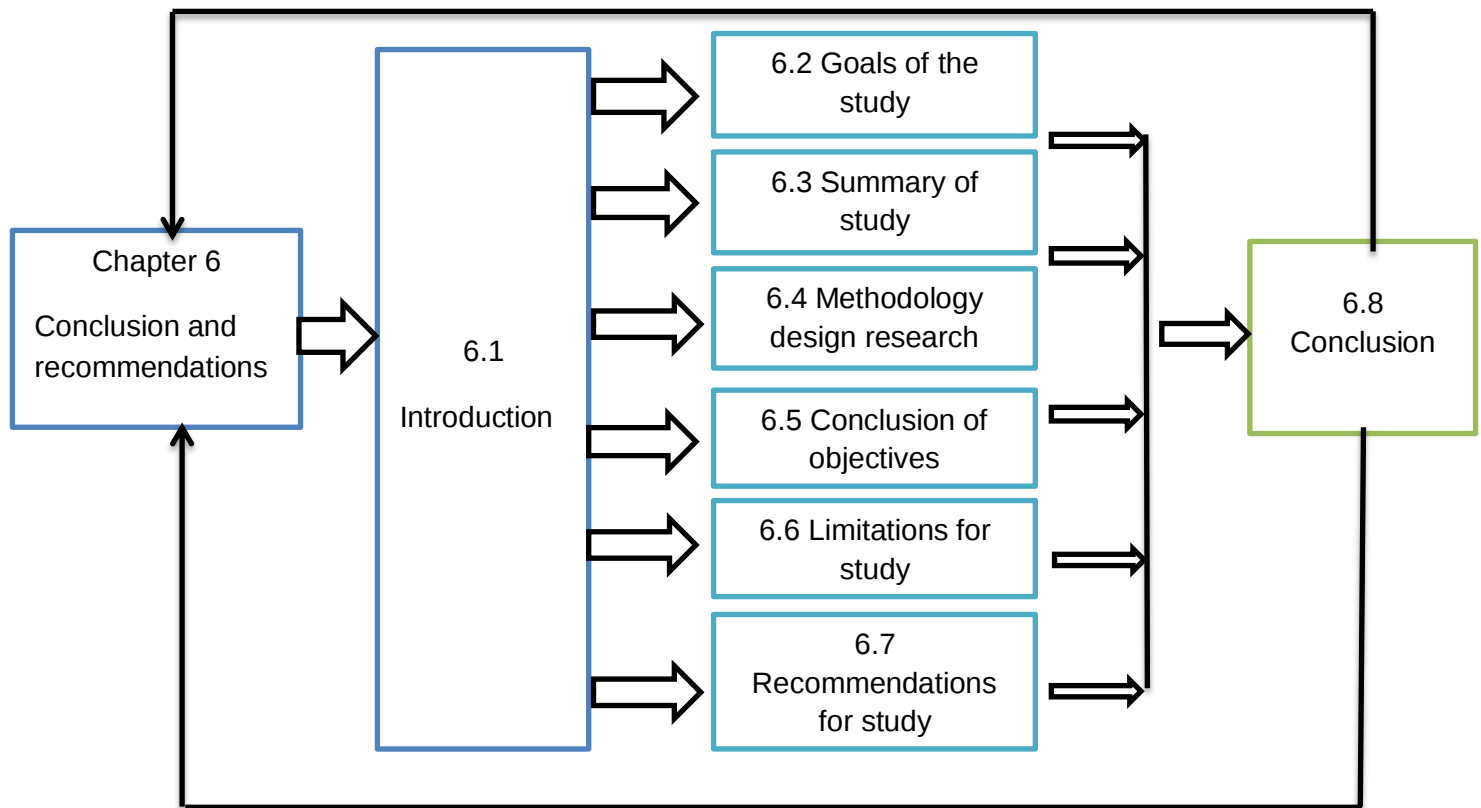
Results were gathered and analysed on (par.5.3.1). The literature review involved a clear concept of IT project failure and Project management and Risk management and research questions were asked on the study to satisfy the objectives of the study. The main research question was asking how can risk management in projects reduce failure in information technology projects, according to the literature review of the study the role of project risk management in IT projects can reduce IT projects failure. Project risk management processes discussed in chapter 3 of the study can reduce IT projects failure. It was found that people who participated in the study stated that IT projects failure is caused by assuming to understand the scope of the project and lack of experience.

5.4 CONCLUSION

The results gathered were collected using an online tool named surveymonkey and the results were analysed using SPSS tool. Validity was measured using content validity and construct validity. Pareto analysis (80/20 rule) was used on this study for survey questions (question 1 to question 5) this rule determined the support of participants from largest to the lowest.

The survey was consistent, reliable and valid. Quantitative results showed that IT projects are being developed in large companies such as private companies and government (public sectors), people who are working on IT projects have less experience in the field, this means that it is a risk to have people with no experience to work on projects. Many projects are being operated or have number of team members that is less than 25 people per team, and looking on the results of the survey this can cause harm to IT projects because there is lack of resources on the teams. Many stakeholders provide a good support or strong support to IT projects which can lead to a conclusion that in many cases of IT projects failure the stakeholders support is not the cause of failure.

It can be concluded that IT projects are still at risks of failure at the high rate, and the causes of the failure within the IT projects could be that there is lack of skills and knowledge, or lack of resources. IT projects require experience in order for them to be successful, this could bring an answer to many IT projects to avoid IT project failure by making uses of risk management when working on IT projects. It is found that the risks of IT projects failure is caused by lack of experience, shortage of resources, unreasonable schedule and budget. The role of risk management is to reduce failure on IT projects.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS**Figure 6.1:** Chapter 6 overview**6.1 INTRODUCTION**

The aim of this chapter is to state conclusion and recommendations for future study. The summary of objectives, limitations and methodology is stated in this chapter. The results obtained from the data collected led to the recommendations that are stated in paragraph 6.7. Figure 6.1 below shows a clear flow of sections that form part of chapter 6.

6.2 GOALS OF THE STUDY

The primary objective of the study was to understand the role of project risk management to reduce failure in information technology projects. The following theoretical objectives and empirical objectives were formed (par. 1.5.2 and par. 1.5.3):

Theoretical objectives

- **Objective 1:** To gain understanding of risk management in project management.
- **Objective 2:** To gain understanding of risk management by focusing on determining risks in IT projects.
- **Objective 3:** To gain understanding of failure in Information Technology projects.
- **Objective 4:** To gain understanding of project management.

Empirical objectives

In accordance with the primary objective of the study, the following empirical objectives are formulated:

- **Objective 1:** To determine the role of project risk management to reduce failure in IT projects.
- **Objective 2:** To analyse the data gathered from questionnaires to determine the use whether the information will be useful to IT projects.
- **Objective 3:** To determine whether information on reducing IT project failure will play valuable part in future projects that involves IT.
- **Objective 4:** To provide information about how project risk management can be used to reduce failure in IT projects.

6.3 SUMMARY OF THE STUDY

The study is divided into six detailed chapters which that are placed in a sequential order. The study starts with chapter 1 which outlines the introduction that provides the content of the study including problem statement. Chapter 2 details the research methodology that the study is using. Chapter 3 outline the project management and risk management from the existing literature. Chapter 4 provide the literature review on IT projects failure using existing literature. Chapter 5 involves the research results and findings of the study that were gathered when data collection method was applied. Chapter 6 tables the conclusion of the whole study.

Chapter 1: Introduction and problem statement

Research has been done in Project management and risk management field, and IT projects failure. Literature review in chapter 3 and chapter 4 provide full amount of data

about project management and risk management, and IT projects failure. The problem statement was stated in chapter 1 of this study.

Chapter 2: Research methodology

The research process was used as a guide that led to completion of this study. Research methodology was discussed in chapter 2 of this study, and one research design was chosen as part of this study which involves quantitative research methodology. Different methods based on quantitative methodology were used to collect data for the study, this data collection methods includes (survey, interviews and observation).

Chapter 3: Project management and risk management

Literature review on project management and risk management was conducted from existing literature. The literature reviewed assisted the researcher to know and to have an understanding of both project management and risk management. When conducting a research a literature review is required to be conducted. The literature review covered the research questions of the study. This part of the study was outlined in detail in chapter.

Chapter 4: IT project failure

Literature review on IT projects failure was conducted on chapter 4 using existing literatures. In order to gain more knowledge in the subject of IT projects failure the researcher needed to immerse herself in existing literature of previous studies.

Chapter 5: Research results and findings

The results and findings were discussed in this chapter. This data was gathered through the use of quantitative data-collection methods. A total of 47 participants took part on the study. A total of six (6) participants were selected to take part in interview and observation sessions. The questionnaire involved questions that are applicable to the study and assisted the researcher to meet the objectives of the study. Pareto analysis was used to analyse data in a form that would be easier for the reader to understand.

Risk management plays a very important role in reducing IT project failure. Risk causes danger to projects thus it needs to be identified and mitigated. Risk management process can be used to handle risks within IT projects and by so doing it can minimize the chances of IT project failure.

Chapter 6: Conclusion and recommendations

The conclusion of the study is provided in this chapter, and the recommendation for further research is also stated. It is important to provide recommendations of the research in order to assist future researchers on what to conduct their further studies on. The summary of the whole study is also presented in this chapter.

6.4 METHODOLOGY DESIGN RESEARCH

In this study data was collected using a quantitative research paradigm and as such the interviews and a survey were carried out conducted. The research objectives of the study led to research questions which helped the researcher to complete the study. A target population was stated and then a sample frame was selected from the target population. Quantitative method was used to gather information from different individuals who are IT students, IT project team members and people who are involved in IT projects.

6.5 CONCLUSION OF OBJECTIVES

The conclusion pertaining to each theoretical and empirical objective of the study is presented below.

Theoretical objectives

- **Objective 1:** To gain understanding of risk management in project management

Project management has different concepts in it and the study was focusing on risk management within project management. The risk management concept was discussed in the study and it was further been taken to IT projects to satisfy the primary objective of the study.

- **Objective 2:** To gain understanding of risk management by focusing on determining risks in IT projects

Risk management literature was conducted by the researcher. The term risk was defined as something that cause harm on projects. Then risk management was defined as a procedure of analysing risks and mitigate them. In IT projects risk is an ever present feature of any kind of projects. In IT projects risks need to be identified, analysed, evaluated, and treated in order to reduce the failure of projects.

- **Objective 3:** To gain understanding of failure in Information Technology projects

The literature review on IT projects failure was discussed in chapter 4 of this study. The researcher gained understanding of IT projects failure by reading the existing literature relating to the current study. Literature revealed that there is a very high failure rate among IT projects. This high failure is said to cost companies a lot of money. A problem statement was then formulated based on the high rate of failure in the IT field.

- **Objective 4:** To gain understanding of project management

In order to understand the concept of project management, the word project management was defined by various authors (see sec 3.2). Project management was defined as a manner in which a project is managed, planned, monitored and implemented. This therefore inspired the study to focus on other aspects of project management such as project management knowledge areas. These knowledge areas were discussed in the study. The researcher then focused on only one knowledge area which is project risk management. The understanding of project management was also discussed in the study.

Empirical objectives

- **Objective 1:** To determine the role of project risk management to reduce failure in IT projects

A quantitative method was used to collect data that was used to determine the role of project risk management in reducing failure in IT projects. It was found that a thorough risk analysis process needs to be performed in any IT project. This could help reduce failure of projects.

- **Objective 2:** To analyse the data gathered from questionnaires in order to determine whether the information provided by participants will be useful in IT projects.

Data collected was analysed using IBM SPSS software and the results were discussed in see section 5.3.1.1.3. The information gathered showed that the study will be useful in IT projects. Pareto analysis was used to show the most frequent data values.

- **Objective 3:** To determine whether information in reducing IT project failure will play any valuable part in future projects that involves IT.

The information on reducing IT projects failure will play valuable role in IT projects and it will save the company money. Future projects failure can be reduced when the information of this study is considered.

- **Objective 4:** To provide information about how project risk management can be used to reduce failure in IT projects

Risk Management concept was explained in chapter 3 and the process of risk management was also discussed in the same chapter. This will help the IT project teams to understand the risk management process and they will follow the process to ensure that the rate of IT projects failure is reduced.

6.6 LIMITATIONS FOR STUDY

Each research study has limitations associated with it, for this study the limitations are as follows:

- The study was conducted in South Africa with individuals and not big companies.
- Project Management have nine knowledge areas and the study focused only on risk management.
- The study was limited only to find the role of Project RM in reducing the failure of IT projects.
- Time constraint limited the study to only 47 participants' data.

6.7 RECOMMENDATIONS FOR STUDY AND IT PROJECT MEMBERS

6.7.1 Recommendations for further study

Each research study has commendations, for this study the recommendations are as follows:

- The failure of IT projects can be determined using various factors, namely time, costs, and scope.
- The research can be made based on which methodologies can be used to ensure that the rate of IT failures is reduced.

- The research can be made based on nine project management knowledge areas to reduce IT projects failures.
- Develop a program that will track risks that the projects encounter and reminds the projects team members to look at the program every day to reduce failure in IT projects.
- Risk management life-cycle is associated with IT projects.
- Future researchers can use Pareto analysis on their study to great report from the highest support to the lowest support.

6.7.2 Recommendations for IT project members

The recommendations for IT project managers are as follows:

- Involve all project management knowledge areas in the project.
- Gain more understanding on the subject because confusion at later stages of projects can prove very costly. Try not to assume anything and be eager to learn and ask to get clarification.
- Be open to new skills as technology changes often. Have time to learn new tools and new methods and, new ways of operating.
- Prioritise tasks (project management software) is a very useful tool to use.
- Be proactive, think out of the box and be positive (negative minds lead to negative solutions).

6.8 CONCLUSION

The research objectives were in this study and the research questions of the study were answered. Recommendations and limitations were also discussed in this chapter. The researcher herein believes that this will help future researchers to have an idea of which route to follow. The researcher hopes that the recommendations will be taken into consideration and that the failure of IT projects will be reduced.

The researcher also believes that the recommendations made about future studies and to IT project members will be of valuable use to IT projects in general. The purpose of this study was to reduce IT project failure using risk management as a tool. The results gathered through this study proved that risk management can be used to reduce failure in IT projects. The results gathered showed that project management plays a very important part in IT

projects therefore it is important to employ it in all IT projects. Pareto analysis was also found to be helpful project members in granting them the required support of their projects from the highest to the lowest. Project risk management needs to be identified for each project and solutions identified risk must also be found.

Information Technology projects play a very important part in the industry, and based on the results of the study it can be concluded that the research is going to have a positive influence in the IT industry in general.

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Appendix A: Consent Form

Participant Number:.....

The study focuses on finding the main causes of Information technology Failure focusing on project management constraints, and to find out what can be done to reduce the high rate of IT projects failure.

The participants will be asked to fill in the questionnaire, ask inner questions in the interview, and take notes when the participants are answering interview questions meaning the individuals will be observed while answering interview questions.

The information gathered during this study will be kept confidential, and the participant is allowed to withdraw any time during the study.

I declare that I have read the document and I will participate in the evaluation study and I can withdraw anytime I want and keep information confidential.

.....

Signature of participant

.....

Date

Appendix B: Questionnaire Form

Number of participant:

Choose the most appropriate answer

Section 1: Questionnaire on organization and background

1 Type of the organization	
☐	Private Company
☐	Government or public sector
☐	Non-profit organization
☐	Charity or Non-profit organization
☐	Other, please specify.....

2 Role in the project	
☐	Project manager
☐	Team user
☐	Project sponsor
☐	Project team member
☐	Top management

3 Number of years working on projects	
☐	1 year <= 5 years
☐	> 5years
☐	< 10 years
☐	> 10 years and more
☐	Never worked on a project

4 Number of people involved in the project.	
☐	More than 1 person and less than 10 people
☐	More than 10 people but less than 25 people
☐	More than 25 people but not more than 50 people
☐	More than 50 people
☐	None

5 Do stakeholders give full support to IT project managers and the team members involved in a project?	
☐	Yes
☐	No
If no, please provide the reason you think the project doesn't get full support from stakeholders.	

Questionnaire

Section 2: risk management in project management to manage failure in IT projects

2.1 when working on a project which factors do you take into consideration to avoid project failure	
☐	Project risk management
☐	Understanding the scope of the project to have appropriate planning
☐	Make use of your own rules that you have been using to manage project
☐	Look at project cost and schedule

2.2 How do you define project failure?	
☐	Project not delivered on time, exceeded budget or not meeting the scope
☐	Not met all the objectives of the project
☐	Project completed with scope reduced and addition of resources

2.3 What factors cause failure to projects	
☐	Management commitment
☐	Assuming to understand the scope of the project
☐	Less time and lack of resources
☐	Participation of individual project members
☐	Lack of knowledge and experience

Thank you for participating in this questionnaire, your input is highly appreciated.

Appendix C: Observation Form

Participant number:

Time taken to answer questions:

[illegible]

Appendix D: Interview Questions

Participant no:

1. How do you define project failure?

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.....
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2. What do you think about risk management in project management?

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3. Is risk management in project management better way to reduce information technology failure?

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4. Do you think projects need a project manager?

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.....
.....

5. What measures do you use to describe project failure?

.....
.....
.....

Appendix E: Interview questions responses

Participant number 1 answers

1. How do you define project failure?

Interviewee: According to me I will say project failure is any project that doesn't meet the requirements of a sponsor, or maybe the project is completed but the money was little and they had to add more on top.

2. What do you think about risk management in project management?

Interviewee: Risk management we use them on different phases of projects to check things that can harm a project then we find solutions on how to solve the risks or stop the risks from happening.

3. Is risk management in project management better way to reduce information technology failure?

Interviewee: To answer that I will say big yes, because if risks are not identified projects are going to be harmed by unknown threats. But if risk is identified the threats will be known and solutions will be proposed.

4. Do you think projects need a project manager?

Interviewee: Yes, Project managers are important people in the project they are the people who make sure projects are success.

5. What measures do you use to describe project failure?

Interviewee: Project failure can be described using quality, time, money, and requirements.

Participant number 2 answers

1. How do you define project failure?

Interviewee: Project failure to me a project that didn't success of pass, meaning the project can be finished but when we check reality the are things that are not on the project but they were on scope, or maybe it is a project that is considered finished but scope is reduced. That project failure to me.

2. What do you think about risk management in project management?

Interviewee: Risk management right? I think risk management is used to help check the risks in the project and then come up with a strategy to avoid the risks that are being identified.

3. Is risk management in project management better way to reduce information technology failure?

Interviewee: Yes, can reduce IT projects failure.

4. Do you think projects need a project manager?

Interviewee: Yes, Project manager play important part to projects they make sure work is done, project is a success.

5. What measures do you use to describe project failure?

Interviewee: Time can be extended based on the needs of the project and money they can increase it also but the important thing to measure failure is to check the requirements

Participant number 3 answers

1. How do you define project failure?

Interviewee: Project failure is a project that is not delivered on the date they said they will finish it, you know at work we check project failure based on time, cost and scope.

2. What do you think about risk management in project management?

Interviewee: Risk management in project management is a procedure or identifying risks before they cause damage to projects and find a solution to those risks and make sure the project is not damaged.

3. Is risk management in project management better way to reduce information technology failure?

Interviewee: Yes, you know IT projects are very sensitive so risks need to be identified and solved.

4. Do you think projects need a project manager?

Interviewee: Project that doesn't have project managers, I imagine failure only on those projects. Projects need project manager to make it success.

5. What measures do you use to describe project failure?

Interviewee: It can be measured based scope; a project must meet the clients' requirements.

Participant number 4 answers

1. How do you define project failure?

Interviewee: Project failure is a project that was given to the client on time but there are things that are not included in the project as it was promised that they will be there.

2. What do you think about risk management in project management?

Interviewee: Risk Management have to be identified and then need to be managed. It depends on companies how they identify and manage risks.

3. Is risk management in project management better way to reduce information technology failure?

Interviewee: yes, I believe so.

4. Do you think projects need a project manager?

Interviewee: Yes, project managers help to manage the team and make sure they do their work.

5. What measures do you use to describe project failure?

Interviewee: Time, scope and money the most important things to check first.

Participant number 5 answers

1. How do you define project failure?

Interviewee: Project failure at my work we check if the cost was exceeded, scope was met and the project was delivered on time.

2. What do you think about risk management in project management?

Interviewee: Risks helps on reducing harm to projects and they need to identify risks and then mitigate them.

3. Is risk management in project management better way to reduce information technology failure?

Interviewee: Yes risks can cause IT project failure but if they are being checked then IT project failure can reduce.

4. Do you think projects need a project manager?

Interviewee: Project manager is need in every project, so yes.

5. What measures do you use to describe project failure?

Interviewee: Budget, Time, and Scope are the constraints of project management, they need to be check.

Participant number 6 answers

1. How do you define project failure?

Interviewee: Project failure is a project that has failed when things that sponsor requested are not met, and it is delivered late to the sponsor.

2. What do you think about risk management in project management?

Interviewee: The risks in projects help check things that are harmful to projects and solve those things.

3. Is risk management in project management better way to reduce information technology failure?

Interviewee: Yes risk need to be checked and then mitigated, then IT projects failure can reduce.

4. Do you think projects need a project manager?

Interviewee: Yes project need someone who is going to make sure they are up to date, that person is project manager.

5. What measures do you use to describe project failure?

Interviewee: project scope need to be met, or else project failed.

Appendix F: Interview Session (Observation) notes

Participant Number: 1

Time taken to answer questions: 11 minutes

Observation notes:

- The participant is paying attention to all my questions
- Eye contact was good.
- Body language was excellent.
- The participants said he is fine with observation.

Participant name: 2

Time taken to answer questions: 15 Minutes

Observation notes:

- Participant is concentrating on the interview.
- Eye contact was good.
- Correct body language was used.
- The participant said she was ok with observation

Participant name: 3

Time taken to answer questions: 15 Minutes

Observation notes:

- Participant is paying attention.
- Eye contact was good.
- Body language was excellent.
- She was ok with observation.

Participant name: 4

Time taken to answer questions: 20 Minutes

Observation notes:

- The participant looks distracted, and asks me to repeat a question twice.
- The participant tried to make eye contact but it was not good.
- The posture was not good.
- The participant said when I told her that am going to observe her when I interview her she was nervous, but she concluded by saying she was satisfied.

Participant name: 5

Time taken to answer questions: 15 Minutes

Observation notes:

- The participant didn't give full attention when the interview started.
- Eye contact was ok.
- The participant was sitting ok after minutes start sitting like they are tired.
- The participant said the observation session was ok.

Participant name: 6

Time taken to answer questions: 11 Minutes

Observation notes:

- The participant looks fine, attention and concentration is good.
- Eye contact was good.
- The participant was sitting in an upright posture.
- The participant said the observation was ok.