



**ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE DEPARTMENT
OF PROJECT MANAGEMENT
POST GRADUATE PROGRAM**

**ASSESSING PRACTICE OF RISK MANAGEMENT IN IT PROJECTS:
THE CASE OF ETHIOPIAN AIRLINES DIGITAL PROJECT
MANAGEMENT OFFICE**

BY

HADERA ZERAY

**A RESEARCH PROJECT SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL
OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF MASTER OF ARTS IN PROJECT MANAGEMENT**

ADVISOR: DR. BAHRAN ASRAT

**JUNE 2020
ADDISS ABEBA, ETHIOPIA**

ADDIS ABABA UNIVERSITY
COLLEGE OF BUSSINESS AND ECONOMICS
SCHOOL OF COMMERCE

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Statement of declaration

I, **Hadera Zeray**, hereby declare that this research entitled “**Assessing Practice of Risk Management in IT Projects: The Case of Ethiopian Airlines Digital Project Management Office (PMO)**” has been conducted by me under the guidance and supervision of Dr. Bahran Asrat. All materials and sources used for this project research have been acknowledged appropriately. This study has not been presented for a degree in any university.

Hadera Zeray

Signature: _____

Date: _____

Statement of Certification

This is to certify that **Hadera Zeray** has carried out this research project work on the topic entitled “Assessing Practice of Risk Management in IT Projects: The Case of Ethiopian Airlines Digital Project Management Office (PMO) “under my supervision. This work is original in nature and it is sufficient for submission for the partial fulfillment for the requirements of the award of Masters of Art in Project Management.

Bahran Asrat (PHD)

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Date: _____

APPROVAL SHEET

ASSESSING PRACTICE OF RISK MANAGEMENT IN IT PROJECTS: THE CASE OF ETHIOPIAN AIRLINES DIGITAL PROJECT MANAGEMENT OFFICE

By

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Acronyms and Abbreviations

CIO:	Chief Information Officer
ET:	Ethiopian Airlines
ICT:	Information and Communication Technology
IT:	Information Technology
IMC:	Integrated Marketing and Communications
MRO:	Maintenance Repair and Operations
PMBOK:	Project Management Body of knowledge
PMI:	Project Management Institutions
PMO:	Project Management Office
PRM:	Project Risk Management
SPSS::	Statistical Package for Social Science

ABSTRACT

The aim of this project work was to assess the practice risk management of IT projects in Ethiopian Airlines Digital Project Management Office (PMO) by examining risk management processes such as risk management planning, risk identification, risk response, and risk monitoring and control. Managing risks and preparing risk management plan will help the project to identify and estimate the level of the impact of the risk and help for prior preparation to risk impacts. The study applied descriptive research design and used both questionnaires and semi-structured interviews as an instrument to collect primary data, while project reports, risk register, and project plan were used as sources of secondary data. A mixed approach was used to answer the research questions. A Census survey was conducted to gather the data and questionnaire distributed through email from three departments with a population size of 54. Semi structure interview was employed for the project managers, department managers, and project team leaders and managers. Data were analyzed with the use of SPSS version 23 software using statistical tools of frequency, percentage, mean score, and standard deviation. The result summarized the analysis of risk management practice, risk planning, risk identification, risk analysis, risk response, and risk monitoring and controlling. The finding showed that the mean value for each risk management process was moderate. Most of the risk management practices were used with some differences between theoretical risk management and actual practice of risk management in the study area. Hence, the organization is expected to do more improvement to reach the benchmark best practice level.

Keywords: Risk management, project Management, digital, risk planning, risk identification, risk analysis, risk response, risk monitoring and control.

CHAPTER ONE: INTRODUCTION

1.1. Background of the Study

Organizations undertake different projects to solve existing problems or to introduce new products or services and attain company goals. PMI (2013) defined Project management as an application of knowledge, skills, tools, and techniques to project activities to meet project requirements. However, projects are full of uncertainties and risks in nature unless properly managed may lead to project failure. As Wysocki (2014) notes “risk is some future event that happens with some probability and results in a change, either positive or negative, to the project. For the most part, the risk is associated with loss, at least in the traditional sense”. Compared to the past, many of today's projects are more complex in terms of their structure, technology, and resource demands, their financial, organizational arrangements, and which makes it difficult to predict the future (Wiley J. & Sons, 2008). So the project team then develops a risk mitigation plan that reduces the likelihood of an event occurring or reduces the impact on the project if the event does occur (Darnall, W. & Preston, J.). Project risk management is one of the tools to lessen the impact of the negative downside of risk and utilize the positive side of risk. Project Risk Management is the process of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project. The objectives of project risk management are to increase the likelihood and impact of positive events and decrease the likelihood and impact of negative events in the project (PMI, 2013).

The result from several studies showed that IT project risk management practice in most developing countries is below average, the same is true in Ethiopia. According to Mihret (2016) assessment on Software project Risk Management Practice in Ethiopia revealed that proper risk management was not widely practiced in Ethiopia software projects. Out of 48 sample organizations that undertook software projects only 16% of organizations applied one or more documented risk management processes and techniques. In Addition, as per the researcher, only 11% of the projects were completed on time, within budget, and meeting all or a majority of the specifications. Several risk factors that are common causes of project risk in IT projects are categorized into different groups. As Boehm (2005) identified ten risk factors, which occur most frequently in IT and Software projects are (1) Human error on part of the staff, (2) Unrealistic

schedule and budget, (3) Standard software, external components (inexperience, incompatibility, etc.), (4) Requirements, and developed functions do not match, (5) User interfaces do not fit needs, (6) Inadequate architecture, performance, quality, (7) Constant alteration of requirements, (8) Problems with legacy systems, (9) Problems with tasks performed externally and (10) Overestimation of own IT capabilities. Other risk factors identified by Mihret (2016) are due lack of attention given to project risk as project managers focus more on components whose effect can easily be measured, such as time and budget than risks. Whereas, risk management is considered as extra cost and work by project managers.

Ethiopian Airlines the largest airline in Africa has given more emphasis to state-of-the-art technology as one of the crucial strategic tools to attain its vision 2025. ICT is one of the emerging technology that helps to achieve organizational goals. As an airline, IT is one of the main channels to reach customers from everywhere and at any time. Thus, ET has invested millions of Dollars in IT infrastructures and technology to expand its reach. In Addition, ET has established separate Project management office to manage, facilitate the projects undertaken either in-house or outsourced IT projects effectively.

According to the company's corporate website factsheet released in March 2020, Ethiopian Airlines was founded on December 21, 1945, and started its operation in 1946. ET made the first scheduled international flight to Cairo on April 8, 1946. It is 100% owned by the government of Ethiopia. ET is the largest airline in Africa both in passenger and cargo network, operating with 127 youngest and most modern fleets to more than 127 international destinations across five continents. Currently, its implementing a 15 years strategic plan called Vision 2025 to become the leading aviation group in Africa with seven business units: Ethiopian Domestic and Regional Airline; Ethiopian International Passenger Airline; Ethiopian Cargo; Ethiopian MRO; Ethiopian Aviation Academy; Ethiopian In-flight Catering Services; and Ethiopian Ground Service. Ethiopian registered an average growth of 25% in the past ten years (Ethiopian Airline's factsheet, 2020).

Ethiopian Airlines has been undertaking different IT projects to meet organizational goals. As a result, ET established a new digital division structured under CIO. There are five departments

under a digital division called: digital marketing, Digital Sales, Digital solution, Application Development, and digital PMO & Business transformation. Currently, a number of IT projects which are managed by digital PMO developed internally (by in house development team) and by external vendors. This study focused on the risk management practice of IT projects undertaken by Digital PMO.

The research aimed to assess risk management practices of IT projects undertaken by digital PMO in Ethiopian airlines. The study tried to examine the project management processes practice such as risk planning, risk identification, risk analysis, risk response, and monitoring and control to manage project risks in the study area. In Ethiopian Airlines Digital PMO IT project risk management practice has not been studied scientifically, however considering a number of office report documents, some projects under the digital PMO were not finished on time and project delay has encountered on some projects.

1.2 Statement of the Problem

Organizations take different measures to minimize the risk of project failure. According to Wysocki (2016), developing new capabilities in today's environment is risky by nature especially, if a company wants to establish or maintain a leadership position. However, risk-taking doesn't mean taking chances. It involves understanding the risk-reward ratio, then managing the risks associated with the project. Moreover, managing risk is all about making timely decisions to reduce the severity of a risk and exploit its opportunities. PMI (2013) insist that to be successful, organizational commitment is crucial to address risk management proactively and consistently throughout the project lifecycle. The authors believe that a conscious choice should be made at all levels of the organization to actively identify and pursue effective risk management during the lifecycle of the project. A project risk could exist in all stages of the project lifecycle. Hence, as per PMI, moving forward on a project without a proactive focus on risk management is likely to lead to more problems arising from unmanaged threats. Project risk management tools and techniques support the practices, methods, and various processes used to effectively manage a project.

According to Demaria (2011) findings on risk and risk management practices within Information system outsourcing in Linnaeus University revealed that even though the participants of the university understood about outsourcing IS, the university does not have a documented and structured outsourcing strategy program, as well as, risk management frameworks for IS outsourcing projects are not implemented.

A survey conducted by Mihret (2016) on 45 banks, insurance companies, and UN agency offices in Addis Ababa, Ethiopia. The findings of the study reveal that risk management was not widely practiced in Ethiopian software projects. As per the researcher, measures were not in place by various development organizations for the implementation of risk management. According to the researcher, only 16% of organizations reported that they applied one or more documented risk management processes and techniques. Overall, 67% of organizations were found to exercise one or more risk management process steps. Even though, risk management practice was found to be reasonably high, the proportion of organizations that carry out all the risk management process were only 27%, showing that risk management practice in Ethiopia cannot be considered adequate.

Ethiopian airlines digital PMO conduct different IT projects. There are two types of projects managed by ET digital PMO: In house projects developed by ET staffs' IT application development project team and outsourced projects for external vendors. However, as per the review of unpublished office documents, some projects under the digital PMO were not finished on time as per the original plan and project delay has shown on some projects. From the preliminary interview with some digital division staff, there was a gap in project risk management.

In addition, to the best of the researcher's knowledge, no study had been conducted on the project risk management practices in ET PMO. In Addition, the researcher tried to search for research works on project risk management practice in Ethiopia airlines IT projects in different sources that offer previously done journal articles. However, there was no research work conducted on the risk management practice of IT projects in Ethiopian airlines. As a result, the researcher feels that research on the project risk management practice of IT projects in Ethiopian

Airlines was found more appropriate. Hence this research work is expected to fill the gaps observed on risk management practice of IT projects undertaken by ET digital PMO.

Finally, the researcher shared the finding and observations to Ethiopian Airlines regarding the existing risk management practice of IT projects.

1.3 Research Question

The following research questions are developed based the research objective.

- ✚ To what extent are project risk planning practice properly used in ET digital PMO?
- ✚ To what extent does ET digital PMO use the practice of risk identification practice?
- ✚ To what extent does digital ET PMO utilize the practice of risk analyzing practice and how to use them?
- ✚ To what extent does ET digital PMO use the practice of risk response practice?
- ✚ To what extent are the practices of risk monitoring and controlling practice being used by ET digital PMO?

1.4. Objective of the Study

1.4.1. General Objectives

The main objective of the research was to assess project risk management practice Ethiopian airlines digital PMO.

1.4.2. Specific Objectives

- ✚ To identify whether formal risk management techniques are applied in IT projects of ET digital PMO.
- ✚ To assess the project risk planning practice in ET digital PMO.
- ✚ To assess the Project risk identification practices in ET digital PMO.
- ✚ To assess how identified risks were analyzed in ET digital PMO.
- ✚ To identify the practice of risk response strategy in ET digital PMO.

- ✚ To identify the practice of project risk monitoring and controlling in ET digital PMO.

1.5 Significance of the Study

The study findings are expected to contribute towards the understanding of risk management practices for staff working under ET digital PMO handling IT projects. The research work will help to identify factors that are pertinent to the projects that affect risk management in the targeted study area. It also gives insight into how ET PMO operates in terms of the level of practice of project risk management that contributes to achieving company goals. The organization has been provided with the feedback following the research as to how the organization can improve through the adaption of best project risk management practices. The ultimate purpose was to offer them optimized feedback following the research and give an insightful reference that would be used as literature for other researchers undertaking research work on IT projects concerning risk management.

1.6 Scope of the Study

The research dealt with project risk management practices of IT projects in ET digital PMO. The study only covered ET digital PMO. The industry of focus of the research was ET digital PMO office in Ethiopian Airlines other industries that fall out of the IT context excluded. The research was also geographically limited to Ethiopian Airlines, in Addis Ababa Bole International Airport ET digital PMO. The respondents were selected from three departments under digital PMO. A Descriptive research design was applied and questionnaires and semi-structured interviews were used as an instrument to collect primary data. A mixed approach was applied to answer the research questions.

1.7 Limitations of the Study

The finding of the study was mainly based on the responses obtained from the questionnaire and interview by the staff engaged in IT project management. Besides, even though, there were many organizations involved in IT projects and transportation including private airlines in Ethiopia, this research has geographically cover Headquarter office of ET. Other stakeholders and vendors were not part of this study

1.8 Organization of the Study

The research consists of five chapters. Chapter one the introductory part consists of a background of the study, statement of the problem, research questions, research objectives, significance of the study, the scope of the study, limitation of the study, and organization of the study. Chapter two gives information to the readers about the review of related literature of what has been already known in the area of the study. Chapter three discusses the methodology applied in the study, including, research design, research approach, population, source of data, and method of data collection, the procedure of data collection, and method of data analysis. Chapter four describes the analysis, result, and discussion, details of the demographic information of respondents, result presentations, description, and analyses of data collected via proposed instruments, finally, chapter five contains a summary of findings, conclusions, and recommendations.

1.9 Definition of key terms

Project: a temporary endeavor undertaken to create a unique product or service, temporary means that the project has a definite ending point, and unique means that the product or service differs in some distinguishing way from all similar products or services (PMI, 2013).

Project management processes: These are the logical sequence of stages project management follows. It begins with the feasibility study and initiating, planning, execution, monitoring, and controlling and closing (PMI, 2013).

Project success criteria: Project success criteria are the set of principles and standards by which the project will be judged at the end to decide whether or not it has been successful. Project success criteria adopted the so-called Iron Triangle of 'Time, Cost and Quality' as the set of principles for evaluating the success of a project (Pinto, 2013).

Project risk: is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives such as scope, schedule, cost, and quality (PMI, 2013).

Project Risk Management: is the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project (PMI, 2013).

Plan Risk Management: is the process of defining how to conduct risk management activities for a project (PMI, 2013).

Project risk identification: is the process of determining which risks may affect the project and documenting their characteristics (PMI, 2013).

Qualitative Risk Analysis: is the process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact (PMI, 2013).

Quantitative Risk Analysis: is the process of numerically analyzing the effect of identified risks on overall project objectives (PMI, 2013).

Risk mitigation: is a risk response strategy whereby the project team acts to reduce the probability of occurrence or impact of risk (PMI, 2013).

Control Risks: is the process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project (PMI, 2013).

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 Introduction

The purpose of this chapter was to give detailed information about risk, risk management in projects, and risk management practice by reviewing theoretical, conceptual, and empirical literature conducted so far. Moreover, a review of related literature helps to adapt the best methods and approaches for risk management practice in the research area. As Creswell (2013) defined the literature review is a piece of a recap of journal articles, books, and other documents that define the past and the current state of information on a specific research study. Therefore, a review of related literature enables the researcher to discover existing knowledge in a specific area.

2.2 Theoretical literature

The main purpose of the theoretical literature review in this study was to provide an insight into the evolution of risk, risk management, project, project management, risk factors, common sources of risk, and risk management process by conducting a review on journal articles, books, and other documents.

2.2.1 Project and Project Management

Different researchers and authors defined the project in different ways. Some of the definitions are stated as follow:-

Projects are undertaken with a specific objective in mind either to solve an existing problem or introduce new products or services. One of the most common definitions which are cited by many authors and researchers in the Project management Institute's definition. According to PMI (2013) project is defined as a temporary endeavor undertaken to create unique products, services, or results. Similarly, Kerzner (2009) noted, “project is a series of activities and tasks that have a specific objective to be completed within certain specifications, have a defined start and end dates, have funding limits and consume human and non-human resources”. Projects are different

from normal operations for the reason that a project is usually a one-time activity with a defined set of desired results and it can be divided into subtasks that must be accomplished to achieve the project goals (Jack R. Meredith & Samuel J. Mantel, 2009). “A project is a sequence of unique, complex, and connected activities that have one goal or purpose and that must be completed by a specific time, within budget, and according to specification” (Wysocki, 2014). As project success has a direct relationship with the choice of the right processes used to meet the project objectives, and balance the competing demand of scope, time, cost, quality, resources, and risk to produce specified product, service, or result.

Project management has a big role to attain organizational goals. Thus, different organizations establish a dedicated project management office that governs processes and facilitates the sharing of resources, methodologies, tools, and techniques. There is a wide range of project management definitions. PMI (2013) defines Project management as the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. On the other hand, as per Kerzner (2009), definition project management is all about organizing, planning, directing, and controlling of organizational resources for a specific objective which has been established to finish specific goals and is concerned about time cost, quality targets, in line with the overall tactical and strategic requirement of the client. Others see project management on the negative side, because of its huge organizational complexity since it consumes a greater amount of resources (Jack R. Meredith & Samuel J. Mantel, 2009).

2.2.1 Project Management Knowledge Areas

A study conducted on the trend of project management from 1966 to 2015 showed that PMBOK was first published in 1983 containing only 6 knowledge areas (scope, time, cost, quality, human resources, and communication management) (Biggins, D. & Wright, T. & Et al.). However, in the past years, increasing attention has been given to the subject of managing some of the risks inherent in most projects, knowledge areas, such as Procurement became standalone issues as one of the knowledge areas (Jack R. Meredith & Samuel J. Mantel, 2009). “A Knowledge Area represents a complete set of concepts, terms, and activities that make up a professional field, project management field, or area of specialization. These ten Knowledge Areas are used on

most projects most of the time. Project teams should utilize these ten knowledge areas and other use as appropriate, for their specific project. The knowledge areas are Project Integration Management, Project Scope Management, Project Time Management, Project Quality Management, Project Human Resource Management, Project Communications Management, Project Risk Management, Project Procurement Management, and Project Stakeholder Management” (PMI, 2013).

2.3 Risk and project Risk management

2.3.1 What is Risk?

Projects are full of uncertainties unless properly managed may lead to project failure. Most of today’s projects are more complex than before in many ways the structure used, the technology introduced and resource demands, their financial and organizational arrangements. Besides, present-day projects are also performed in a constantly changing environment which resulted in difficulty in predicting the future (Wiley J. & Sons, 2008).

PMI (2013), defined risk as an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives such as scope, schedule, cost, and quality. Other researchers associate risk with only the negative side that potentially cause damage to project success. As per Jack & Samuel (2009), risk has been described as being unsure about project task durations and/or costs, but uncertainty plagues all aspects of the work on projects and is present throughout project life cycles. Even though the risk is not part of the project scope triangle sometimes called the iron triangle, the risk is there in all parts of the project both internal and external as a result it affects the remaining five project constraints (Wysocki, 2014).



Figure 1: The Scope triangle (Wysocki, 2014).

There is no single answer on how to manage risk and one size that fits all projects or circumstances. As a result, Kerzner (2009) recommended that project managers must use appropriate tools and techniques and rely on sound judgment when dealing with risk.

2.3.2 Risk management

Risk management is one of the project management body of knowledge areas that deal with risk. Unless risks are properly managed can cause an adverse effect on project success and can lead to project failure. Kerzner (2009) stated risk management as “the process of identifying, quantifying, and responding to the risks of the project without any material impact on the project’s objectives”. Similarly, PMI (2013) defined risk management as the process of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project. According to the authors, the objectives of project risk management are to increase the likelihood and impact of positive events and decrease the likelihood and impact of negative events in the project.

Wysocki (2014), defined risk as some future event that happens with some probability and results in a change, either positive or negative to the project. For the most part, the risk is associated with loss, at least in the traditional sense. But there might be again if the event happens. According to PMI (2013) organizations perceive risk as to the effect of uncertainty on projects and organizational objectives. At the same time, organizations and stakeholders are willing to accept varying degrees of risk depending on their risk attitude. The risk attitudes of both the organization and the stakeholders may be influenced by a number of factors, which are broadly classified into three themes according to PMI:

- ✚ *Risk appetite*, which is the degree of uncertainty an entity is willing to take on in anticipation of a reward.
- ✚ *Risk tolerance*, which is the degree, amount, or volume of risk that an organization or individual will withstand.

- ✚ *Risk threshold*, which refers to measures along with the level of uncertainty or the level of impact at which a stakeholder may have a specific interest. Below that risk threshold, the organization will accept the risk. Above that risk threshold, the organization will not tolerate the risk.

Kerzner (2009) insist that risk management is not a separate project office activity assigned to a risk management department rather it should be treated as one aspect of project management and should be closely aligned with key project processes, including but not limited to overall project management, system engineering, configuration management, cost, design/engineering, earned value, manufacturing, quality schedule, scope, and test. So project management is proactive rather than reactive, positive rather than negative, and seeks to increase the probability of project success.

PMI (2013) insist that in order to be successful, an organization should be committed to addressing risk management proactively and consistently throughout the project. In addition, a conscious choice should be made at all levels of the organization to actively identify and pursue effective risk management during the life of the project. Project risk could exist at the moment a project is initiated. Moving forward on a project without a proactive focus on risk management is likely to lead to more problems arising from unmanaged threats.

2.4 Project Risk Management Process

As a project manager risk management strategy is important that should be established early in a project and that risk must be continually addressed throughout the project life cycle (Kerzner, 2009). According to (PMI, 2013) managing risk has six processes: risk management planning, risk identification, qualitative risk analysis, quantitative risk analysis, risk response planning, and risk monitoring and control. However, as per Wysocki (2014), many project managers view risk as something they pay attention to at the beginning of the project by building some type of risk management plan and then file it away so they can get on with the real work of the project. Effective project managers treat risk management as a dynamic part of every project.



Figure 2: Continuous Risk Management Process (PMI, 2008)

2.4.1 Plan Risk Management

As per PMI (2013) Plan Risk Management is described as the process of defining how to conduct risk management activities for a project. The key benefit of this process is that it ensures that the degree, type, and visibility of risk management are commensurate with both the risks and the importance of the project to the organization. The risk management plan is vital to communicate with and obtain agreement and support from all stakeholders to ensure the risk management process is supported and performed effectively over the project life cycle.

According to Frame (2009) risk management plan should address how the team will approach the risk. Developing a risk management plan is a significant part of the project planning process. The more complex and uncertain the project, the more important it is to have a dynamic and maintained risk management plan Wysocki (2014). Careful and explicit planning enhances the probability of success for other risk management processes. Planning is also important to provide sufficient resources and time for risk management activities and to establish an agreed upon basis for evaluating risks. Careful and explicit risk planning helps guide the project team’s reactions when a particular event occurs later (Gary L. & Brad M., 2019).

2.4.2 Risk Identification

Once risk planning is conducted the second and most complex step is risk event identification that consists of identifying and documenting potential risk events to the project (Gary L. & Brad M., 2019). As per the authors this process is performed by the project manager, project team members, risk management experts, business process experts, customers, end users, other technical resources, stakeholders, and outside experts. In the same manner, Frame (2009) describes “Risk identification as a process of uncovering potential risk events in order to avoid unpleasant surprises”. The researcher also insist that risk identification should be undertaken systematically. Besides, it can focus on both internal and external risks, those that are predictable versus those that are unpredictable, those over which a measure of control versus those that are largely uncontrollable, and those are technical versus those are nontechnical. Wysocki (2014) argue that the first is risk identification, and it generally occurs as part of project planning activities. In this part of the process, the entire planning team is brought together to discuss and identify the risks that are specific to the current project.

PMI (2013) describe risk identification as the process of determining which risks may affect the project and documenting their characteristics. The key benefit of this process is the documentation of existing risks and the knowledge and ability it provides to the project team to anticipate events. The inputs, tools and techniques, and outputs of this process. Risk identification is the process of examining the program areas and each critical technical process to identify and document the associated risk (Kerzner, 2009). insist that, risk identification is not an area of project planning that you should really skip, being one of the most important processes in risk management.

According to PMI (2013), some of the common risk identification methods include like information gathering methods that consists of workshops, brainstorming, interviews, questionnaires, root cause analysis, consulting experts, experience, SWOT analysis, Delphi techniques, risk breakdown structure and visit location. Another method is documentation which comprises of databases, historical data from similar projects, templates, checklists, study project documentation (plan, files etc.) and study specialist literature. The rests are research, models and

decision drivers. According to Tayntor (2009) there are a number of possible techniques for identifying risks. Brainstorming, in which participants offer ideas and a scribe record them is commonly used techniques and one of that the relocation teams employed for its own risk identification. The better job you do of identifying the projects risks at the planning stage, the more comprehensive the risk response plan will be .

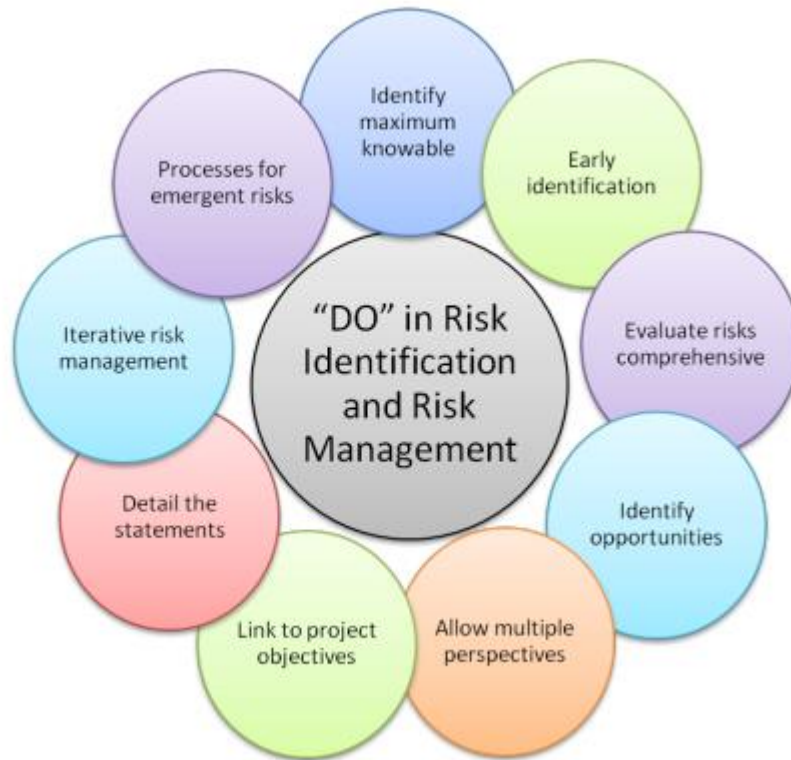


Figure 2.3.2 Steps to DO in risk identification and risk management

2.3.3 Qualitative Risk Analysis

Once project risks are carefully identified using different tools and techniques the next stage is to deal with the determination of qualitative rating values for the identified threat or opportunity and qualitatively label each item as to their likelihood of occurrence and impact. (Gary L. & Brad M., 2019). Qualitative Risk Analysis is the process of prioritizing risks for further analysis or action by assessing and combining their probability of occurrence and impact. The key benefit of this process is that it enables project managers to reduce the level of uncertainty and to focus on high-priority risks (PMI, 2013). Qualitative risk analysis strives to determine the impact and probability of the risk events being reviewed. The impact can be described according to a

qualitative scale – for example, none, minor, medium, serious, catastrophic. Similarly, the probability of the event’s arising can be described according to a scale – for example, highly unlikely, unlikely, somewhat likely, likely, highly likely, where each of these labels of like-hood can be assigned a probability value Frame (2009). An organization can rate a risk separately for each objective (e.g., cost, time, and scope). In addition, it may develop ways to determine one overall rating for each risk. Finally, opportunities and threats are handled in the same matrix using definitions of the different levels of impact that are appropriate for each (PMI, 2013).

Some of the tools and techniques that can be used to analyze risk qualitatively are risk probability and impact assessment, probability and impact matrix, risk data quality assessment, risk categorization, risk urgency assessment, and expert judgment. A well-done qualitative risk analysis will provide risk analysts with a good sense of what they may encounter in their projects (Frame 2009).

2.4.3 Quantitative Risk Analysis

When a quantitative risk analysis methodology is used, the results can be grouped by existing cost risk, schedule risk, or technical risk boundaries that have specifically been tailored to the program, or by performing a cluster analysis on the results (Kerzner, 2009). Quantitative Risk Analysis is estimating the probability and consequences of risks and estimating the implications for project objectives. This involves numerically evaluating selected high impact risks for further examination. The main output of this process also involves updating the risk register (Gary L. & Brad M., 2019).

Quantitative Risk Analysis is the process of numerically analyzing the effect of identified risks on overall project objectives. The key benefit of this process is that it produces quantitative risk information to support decision making in order to reduce project uncertainty. It is used mostly to evaluate the aggregate effect of all risks affecting the project. When the risks drive the quantitative analysis, the process may be used to assign a numerical priority rating to those risks individually (PMI, 2013).

2.4.4 Risk responses

Plan Risk Responses is the process of developing options and actions to enhance opportunities and to reduce threats to project objectives. The key benefit of this process is that it addresses the risks by their priority, inserting resources and activities into the budget, schedule and project management plan as needed (PMI, 2013).

According to PMI (2013) there are three strategies, which typically deal with threats or risks that may have negative impacts on project objectives if they occur, are: avoid, transfer, and mitigate. The fourth strategy, accept, can be used for negative risks or threats as well as positive risks or opportunities. Project managers take different decisions to handle identified risks some of them are stated as follow:

Avoid: This involves changing the project plan to eliminate the events (Gary L. & Brad M., 2019).

Transfer: Risk transfer requires transferring or shifting the negative impact, along with responsibility for its management to a third party. The process reduces the risk only if the third party is more capable of taking steps to reduce the risk. It typically involves payment of a risk premium to the party taking on the risk (Gary L. & Brad M., 2019). It is only transferred to the party that is best able to manage it (PMI, 2008).

Mitigate: Risk mitigation is a risk response strategy whereby the project team acts to reduce the probability of occurrence or impact of a risk which implies a reduction in the probability and/or impact of an adverse risk to be within acceptable threshold limits (PMI, 2013). This can involve a host of options that are designed to lower the risk exposure to the project (Gary L. & Brad M., 2019).

Accept: Some risks are so small and easily dealt with that it is not economical to spend time developing a response mitigation plan. In these cases, the event is simply put on a watch list for monitoring, but nothing else is done to minimize the potential occurrence (Gary L. & Brad M., 2019).

2.4.5 Risk Monitor and Control

Control Risks is the process of implementing risk response plans, tracking identified risks, monitoring residual risks, identifying new risks, and evaluating risk process effectiveness throughout the project. The key benefit of this process is that it improves the efficiency of the risk approach throughout the project life cycle to continuously optimize risk responses.

2.5 Empirical Literature Review

Different researchers made an assessment of the practice of risk management processes on different projects locally in the Ethiopian context and internationally. Most of the Ethiopian projects' risk management practices lack efficiency and effectiveness that is why many projects are seen performing below their intended objectives.

As per Kipyegen & Mwangi (2012), a descriptive research design was adapted to the target population was 48 ICT of small and medium information communication technology (ICT) enterprises in Nairobi, Kenya. The authors finding shows that many (ICT) enterprises in Nairobi, Kenya have realized the importance of risk management practice in ICT project management to achieve process success. ICT enterprises that manage risk effectively and efficiently enjoy financial savings and greater productivity, improved success rates of new projects, and better decision making.

conducted a research to find out whether risk management make a difference in project success. The researchers result reveals that a positive statistical correlation exist between senior management supports for project risk management practices, actual practices and reported positive project management results.

Mihret (2016) examined the risk management practices of software project development in Ethiopia on 45 banks, insurance companies and UN agency offices in Addis Ababa, Ethiopia. The risk management practice that was carry out all the risk management process phases, through formal or informal methods, was only 27%, showing that risk management practice in

Ethiopia cannot be considered adequate. Mihret's finding shows that formal risk management is not widely practiced in Ethiopian software projects and only 16% of organizations reported that they applied one or more documented formal risk management techniques. The risk items that Ethiopian software projects face most were found to be technical complexity risks, with the highest risk item being use of new technology. This may be an indication that project managers should give adequate attention to the risks arising from technical complexity. Thus, the Researcher recommends that Ethiopian software project managers should give more emphasis for risk management in their project management.

Tesfamichael (2018) conducted research to assess the practice of project risk management in EthioTelecom in order to address the gap between theory and actual implementation practices. Tesfamichael finding shows that relevant risk planning and risk identification tools were used and the most common risk sources were identified. In addition, all the risk response strategies (control, avoidance, transfer, and acceptance) were exercised. However, there was not a well-developed strategy that considered factors such as budget, schedule and resources, and quality while responding to risk. Tesfamichael also finds out that practice of risk monitoring and controlling was not effective because project performance was not evaluated against risk. There was not transparent communication, periodic review, and response audit of the project risk. The overall outcome of the study indicates that risk management was practiced but there is a gap between the theory of project risk management and the actual practice that is performed in the projects.

Yehualashet (2019) undertaken a study to assess the practice of project risk management in the Ministry of Communication and Information Technology Development of Online Content Regulatory Legal Framework project for Ethiopia. As per the researcher, findings showed that risk identification, qualitative risk analysis, monitoring, and control were fairly practiced. However, the practice of risk planning, risk response, and quantitative risk analysis was very poor.

Daniel (2010) made a qualitative study to investigate risks associated with Information Systems (ISs) outsourcing and the management of these risks within the context of Selected Higher

Learning institutions (HLIs) in Ethiopia. The researcher's finding revealed that all the surveyed HLIs have no documented and structured outsourcing strategy or/and policy, program, and as well as risk management frameworks for IS outsourcing projects. As a result, their risk management practices depend largely on intuition and previous experience.

All the papers emphasize that risk management is crucial for the effectiveness of projects in attaining their goals. However, there is a gap between theoretical frameworks and practical application of the management system so that projects face considerable losses due to unmanaged uncertainties in the life cycle of the project. Therefore, necessary actions should be deployed so that risk management must be taken as an integral component of project management throughout the project lifetime.

CHAPTER THREE: RESEARCH METHODOLOGIES

3.1 Introduction

This chapter aimed at defining the methods and procedures used to conduct the research study. This chapter consists of the research approach, research design, population, and sampling design, data collection methods, data analysis methods, reliability, validity, and ethical considerations.

3.2 Research design

A descriptive research design was used for this study. As the descriptive study is aimed at finding out "what is," question. Kothari (1990) noted, "Descriptive research studies are those studies which are concerned with describing the characteristics of a particular individual, or of a group". This research design selected for a reason that this study was concerned to identify and describe the practice of risk management of IT projects in Ethiopian airlines under digital PMO. Descriptive, exploratory, and explanatory research designs are classified based on the purpose of the research and commonly used in a research study (Saunders et.al, 2009).

Case study structure was used for this study because it enables us is an in-depth insight into bounded system (e.g., activity, event, process, or individuals) based on extensive data collection (Creswell, 2013).

The researcher has deployed a cross-sectional type of research survey to collect data from the target population. Cross-sectional is used over a longitudinal research survey as it is the most popular form of survey used in education and suitable for the researcher to collect data at one point in time Creswell (2012).

3.3 Research Approach

A mixed research approach was adopted for this study to answer the research questions and gain more insight regarding the study area. So the researcher found a mixed-method suitable to collect both quantitative data through a close-ended questionnaire and open-ended semi-

structured qualitative interview questions to answer the research questions. Besides, according to Creswell (2012) mixed methods research is a good design to build on the strength of both quantitative and qualitative data and offer many different perspectives on the study topic and provide a complex picture of the situation.

3.4 Description of study variables

Based on the nature of objective and research questions and the availability of relevant information, a mixed type of research approach was used. So, in order to meet the objective of the study, answer the given research question the practice of risk planning, risk identification, risk response, risk monitor, and controlling risk management was examined.

3.5 Description of the Study Area and target population

The study was conducted in Ethiopian Airlines' digital PMO. There are five departments under digital division digital marketing, Digital Sales, Digital solution, Application Development, and PMO & Business transformation. However, from the five departments, only three departments mainly involved in IT projects and project management processes are Digital solutions, Application Development and digital PMO and Business transformation. So the study only covered three sections and data was collected from the given three departments.

3.6 Population and Sampling technique

According to Creswell (2009), a population is a group of individuals who have the same characteristic. A target population or the sampling frame is a group of individuals or a group of organizations with some common defining characteristics that the researcher can identify and study. The target population size involved in project management is 54 staff. Since the size of the target population size was small that was less than 100, the census was conducted to collect data from the target population. The target population was the staff of three departments from the digital division fully dedicated to managing projects. The three departments were Digital solution, Application Development, and PMO and Business transformation.

3.7 Data collection source, types and instruments

Both primary and secondary data used in this study to get relevant data. The study used closed-ended questionnaires and open-ended semi-structured interviews as instruments to gather primary data from the target population. The researcher also used secondary data sources such as documents related to risk, risk management reports from digital PMO, and other journals related to risk management in IT projects.

For this study questionnaire used to collect primary data for the reason that it's potential to reach out to a large number of respondents with a short period of time; ability to accord respondent's adequate time to respond; offers a sense of privacy and confidentiality to the respondent. The other reason was that the researcher found it a quick and cost-effective way to collect data.

The researcher developed the questionnaire using google form and distributed through mass mailing company application (Microsoft outlook) platforms to all target populations to avoid contact due to pandemic COVID-19 spread and respondents were addressed in a blind copy to keep their privacy and confidentiality of respondents. Whereas, the interview was conducted through telephone. The research questionnaire prepared for the study consisted of three parts. The first part has General information of respondents and the second part is about project risks (risk factors, major areas of risk) has 5 questions. The third and last part of the questionnaire consists of 30 questions under five sections prepared with regard to the project risk management practice.

3.8 Data analysis model, techniques and software

The collected data was analyzed using descriptive data analysis method. The data analysis for the questionnaire was done using SPSS (Statistical Package for Social Science) version 23 after giving numerical code for each response paper. The Researcher used SPSS for the reason that it was readily available and user-friendly data analysis tool with which the researcher was familiar with. Descriptive statistics such as percentage, frequency, and measures of central tendency (mean and standard deviation), and f-tested was used to summarize the responses. The collected

data from the study area were presented with a descriptive method, in tabulated form to make all the data readable and understandable by all concerned parties.

3.9 Reliability and Validity

According to Creswell (2009) reliability means “that scores from an instrument are stable and consistent as well as scores should be nearly the same when researchers administer the instrument multiple times at different times”. The author also insists that when an individual answers certain questions one way, the individual should consistently answer closely related questions in the same way. It is the consistency of measurement over time, whether it provides the same results on repeated trials. It is defined as a characteristic of an instrument that reflects the degree to which the instrument provokes consistent responses. “Validity is described as the degree to which a research instrument measures what it intends to measure” (Radhakrishna, 2007). The questionnaire was mainly used as an instrument to collect data. Most of the questionnaires are adapted from two researchers (Mihret, 2016 & Tesfamichael, 2018) whose validity and reliability tested and conducted successful researches. Therefore, the questionnaire validity and reliability were tested by those researchers. At the same time, the reliability of the questionnaire was also checked by the Cronbach’s-Alpha test coefficient using SPSS version 23.0.

Table 3.7 Cronbach's Alpha

Risk management processes	Common Risk factors in PM Practice	Risk Planning	Risk Identification	Risk Analysis	Risk Response	Risk Monitoring and control
Cronbach's Value	0.800	0.801	0.888	0.863	0.718	0.802

Sources: Own Researcher's Survey

The Cronbach’s-Alpha test coefficient values for each item of close-ended questionnaires shown above indicated is greater than 0.7 which is reliable and acceptable.

3.10 Ethical Considerations

The researcher conducted this research with a clear understanding of ethical considerations as a result respondents were treated with respect and their response was handled with at most confidentiality. Moreover, respondents were asked for their willingness to participate both in the questionnaire and interview parts, and the purpose of the questionnaire was explained in clear terms. Besides, the gathered data were used for this research only.

CHAPTER FOUR: DATA RESULT AND ANALYSIS

4.1 Introduction

This chapter of the study presents a detailed analysis of the sample data collected on the research topic “Risk management practice of IT projects on Ethiopian airlines digital PMO”. A Census survey was conducted to collect data from the target population. Questionnaires were distributed through email to the target population size of 54 respondents and 46 responded successfully representing 85% response rate which was above the minimum limit for a census. As Saldivar (2012) suggests that for a census survey more than 75 % response rate is preferable for validity and reliability of the research. The questionnaires were completed by project managers, application developers, and Project team leaders of the digital PMO. Results and findings of the analysis are used as a basis for the ET digital division and recommendation section of this study.

4.2 Demographic Information

This is to provide demographic information about the respondents which includes gender, age in years, educational background, experience in years, work experience in projects, and position of respondents in the study area.

Table 4.2 Demographic Profile of the Respondents

Demography	Description	Frequency	Percent
Gender	Male	38	82.6
	Female	8	17.4
	Total	46	100
Age in years	20-29	28	60.9
	30-39	16	34.8
	40-49	2	4.3
	Total	46	100.0
Educational Level	Bachelor Degree (BA, BSc)	43	93.5
	MSc and above	3	6.5
	Total	46	100.0
Work Experience in the organization	11-15	4	8.7
	Below 2	19	41.3
	2-5	13	28.3
	6-10	10	21.7
	Total	46	100.0
Work Experience in projects	2-5	19	41.3
	6-10	4	8.7
	Below 2	23	50.0
	Total	46	100.0
Specific role in projects	Developer	31	31
	Project Manager	14	14
	Project Team Leader	1	1
	Total	46	46

Source: Own Research (2020)

4.2.1 Gender

Based on the response from the questionnaire distributed, the gender percentage of the participants is presented as indicated in the above table 4.2.1 above 82.6% of the respondents were male which covers the majority of the participants and 17.4% were female this implies that the organization has lack of gender diversity. Several researchers argue that women's

participation in projects is still low. According to Okoro (2016), organizations should not only give diverse talent personnel but also have to increase women’s participation at all levels of projects.

Gender of respondents in Percent

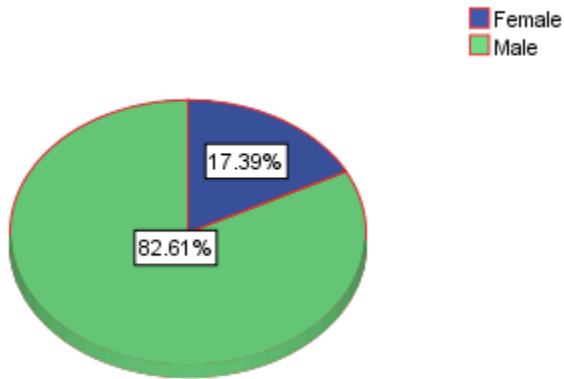


Figure 4.2.1 Gender of respondents

4.2.2 Age

As table 4.2 indicated, 60.9% of respondents were between 20 to 29 years and 34.8% were between 30 to 39 years; the remaining 4.3% of them between 40 to 49 years of age range. This implies that majority of the workforce is in the young age range.

4.2.3 Respondents Level of Education

The availability of project members with the required educational background and qualification plays a critical role in making an informed decision that will increase the project performance by reducing risks. As table 4.2 above indicates 93.5% of the respondents hold bachelor's degrees which is the majority of the respondents and 6.5% are master degree holders. So the level of education of the respondents is a bachelor's degree and above. This implies the majority of the workforce has enough educational background, which is one of the positive factors to reduce risk.

4.2.4 Working Experience

As clearly shown from the above table 4.2 respondents have different levels of work experience. 41.3% of the respondents have below 2 years work experience, 28.3% of respondents were between 2 to 5 years of experience, 21.7% were between 6 to 10 years work experience and 8.7% of participants were between 11 to 15 years of experience in Ethiopian airlines.



Figure 4.2.4 Employee work experience in years

4.2.5 Years of Experiences in Projects

The existence of more experienced staff in the project is one positive factor to minimize risk by limiting errors and inefficiency. As show shown in table 4.2 majority of the respondents had less than 2 years stay in projects which are 50% of the total respondents have below two years' work experience followed by 41.3% with 2-5 years of work experience in projects and the remaining 8.7% with experience in projects had 6-10 years' experience. This indicates the majority of the workforce lacks adequate project experience, which likely increases the project risk.

4.2.6 Specific Role in Project

The workforce was with different roles in the study area with the majority of them were developers which cover 75% of the total of respondents. 21.4% of participants were project managers, the remaining only 3.6% of the respondents were project team leaders. The availability of staffs with different role and position in the project contributes to improving project performance and help to lessen risk as the different perspective have a positive impact.

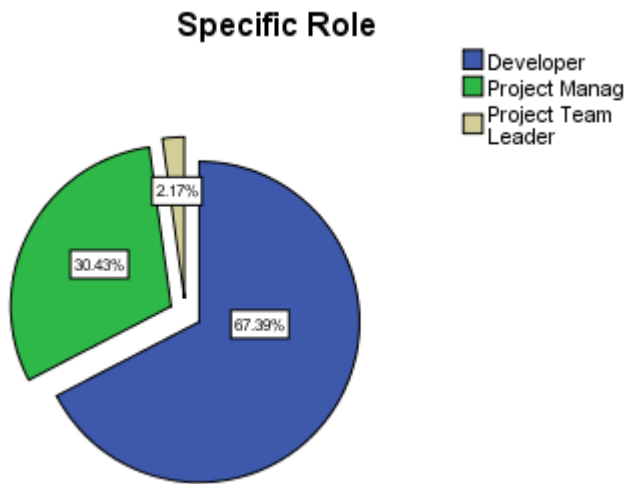


Figure 4.2.6 Specific role in projects

4.3 Risk Management Process Practice

The questionnaire was categorized into five main processes of risk management. Risk planning, risk identification, risk analysis, risk response, and risk monitoring and control. The analysis and discussion are stated as follow:

4.3.1 Sources and factors of Risk Management

The main objective here is to assess the risk management practices of IT projects undertaken by Ethiopian Airlines digital PMO and examines the efforts to adopt risk management processes, tools, and techniques that help to improve project performance. The responses were given a five-point Likert scale and the values where assigned as 1 = strongly disagree, 2 = disagree, 3 =

neutral, 4 = agree and 5 = strongly agree. Statistical analysis of mean, standard deviations and f-test were undertaken to determine equivalence between groups. Creswell (2012) noted, “ mean is the most popular statistic used to describe responses of all participants to items on an instrument”. The mean clearly shows to what extent the sample group agrees or disagrees with different statements. Therefore, when the mean is lower the respondents disagree with the statement and the higher the mean the more the respondents agree with the statement. On the other hand, the standard deviation shows the variability of an observed response from a single sample. The mean values were presented in tables, along with the standard deviation of values for each dimension.

Mean values have been interpreted by adopting the criteria suggested by Landell (1977) & MohdNajib (1994), for Likert type scale ranging from 1 to 5, the interpretation of mean values should be like: from 1.00 to 2.33 means Low; mean values from 2.34 to 3.64 means Moderate and from 3.68 to 5.00 means High.

4.3.1 General Data Reliability Test

F-test was applied to test the statistical significance of the mean value of risk management practice. The result of the test shows that the significance value is 0.00 (i.e., p-value = 0.00), which is less than 0.01. This implies that there is a high statistical significance with a 0.001 degree of freedom.

Table 4.3.1 Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	3.251	2.826	3.630	.804	1.285	.056	30

Table 4.3.2 ANOVA F-Test

	Sum of Squares	df	Mean Square	F	Sig
Between People	456.716	45	10.149		
Within People					
Between Items	74.901	29	2.583	4.269	.000
Residual	789.632	1305	.605		
Total	864.533	1334	.648		
Total	1321.249	1379	.958		

Grand Mean = 3.25

Table 4.3.3 Common risk factors in PM

No.	Common risk factors Activities in Project Management	Mean	Std. Deviation
1	The development team members are adequately trained.	3.48	.809
2	The development team members are well experienced.	3.11	.971
3	There is adequate top management support for the project.	3.33	1.012
4	The organizational environment is stable.	3.26	.905
5	Adequate resources are allocated for the project team	3.20	.957
6	The project has a standard risk management process.	2.96	.965
7	There is responsible person or department handle risk.	3.00	1.033
8	There is dedicated project management office.	3.59	1.045
9	There is a policy and procedure that guide the project team to go through a disciplined risk management process.	3.17	.851
10	Project team have deep project experience in risk management.	2.91	.812
Grand mean		3.2	

The overall result of the survey shows that a total score of mean 3.201 which moderate level of practice in managing commonly known risk factors and sources of risk in project management in the study area. This indicates that the study area gives due attention to defining the risk factors and sources of risk in IT projects. Information obtained by interviewing team leaders and project managers with regard to overall risk management practice is also consistent with the overall result from respondents. The organization is aware of risk factors and their consequence but the project managers and team leaders believe there is still a gap for improvement.

Table 4.3.4 Risk management implementation stage

2.Risk management is implemented at which stage of the project	Frequency	Percent
Conceptual	4	8.7
Conceptual; Planning	4	8.7
Conceptual; Planning; Implementation	1	2.2
Conceptual; Planning; Implementation; Monitor and control	3	6.5
Conceptual; Planning; Monitor and control	1	2.2
Implementation	4	8.7
Monitor and control	4	8.7
Planning	5	10.9
Planning; Implementation	16	34.8
Planning; Implementation; Monitor and control	2	4.3
Planning; Monitor and control	2	4.3
Total	46	100.0

Source: Own Research (2020)

The respondents were asked to rank the PM stage in which risk management is implemented and their response was as follows: According to the respondents' rating most of them responded planning and implementation stages, followed by Monitor and control, conceptual and planning stage. So this implies that risk management is implemented throughout the project lifecycle but most of the respondents believe that risk management is implemented in the planning and implementation stage of the projects. Even though, risk management implementation is equally important in each stage of the project.

4.3.2 Risk Planning

The study wanted to determine the degree to which project risk planning was implemented in the study area. The respondents were asked six questions regarding risk planning practice in the

study area. The responses were placed on the five Likert scale and the results are as presented in Table 4.3.2.

Table 4.3.2 Risk Planning Activities

No.	Activities in Risk Planning	Mean	Std. Deviation
11	There is systematic approach or careful planning.	3.11	.900
12	Relevant stakeholders are involved in the planning.	3.52	.691
13	Tools like expert judgment, meetings or others are considered for risk planning.	3.37	.799
14	Environmental factors are included as an input to plan for uncertainties.	3.63	.853
15	Project team members receive training or have enough knowledge about how to handle uncertainties.	3.11	1.120
16	Risk management plan is incorporated with the project plan.	3.41	.909
Grand Mean		3.35	

Source: Own Research (2020)

As table 4.3.2 indicates that risk planning mean is 3.35 which is a moderate level of risk planning practice and this shows the organization defines risk planning activities in the planning phase. Besides, there is good progress in participating relevant stakeholders and taking into account environmental factors during risk planning. Similarly, based on the information from the interview the organization is aware of risk planning activities and risk management processes are in place. However, formal procedures were not followed at the same level among different project members.

4.3.3 Risk Identification

This was to determine the degree to which project risk identification was implemented in the study area. The respondents were asked to the extent to which they agreed with statements concerning this. The responses were placed on the five Likert scale and the results are as presented in Table 4.3.3.1.

Table 4.3.3.1 Risk identification Activities

No.	Activities in Risk Identification	Mean	Std. Deviation
17	Project team members play roles to identify risk	3.46	.808
18	Risk register is produced as an output in risk identification process	3.52	1.027
19	Documentation review conducted to identify risks.	3.39	.906
20	Stakeholder register used to engage key stakeholders during risk identification process.	3.57	.958
Grand Mean		3.48	

Source: Own Research (2020)

The result of the survey indicates that the score of project risk identification is mean of 3.48 which indicates a moderate level of risk identification practice. This implies that risks are identified at the initial stage of the project. Identifying risks at the beginning of a project is the most important activity in risk identification. This gives a warning signal for the project manager to take proper measures in good time. As per data collected from the interview, the project teams experience an unidentified risk as to the project progress. This shows that there is still a need for improvement to avoid unforeseen risks at a later stage of the projects.

Table 4.3.3.2 Risk Identification tools and techniques

The following method is primarily used to identify risks within the project:	Frequency	Percent
Checklists	1	2.2
Checklists; Document Review	3	6.5
Checklists; Document Review; Information gathering; Assumption analysis	2	4.3
Checklists; Information gathering; Other	1	2.2
Document Review; Information gathering	1	2.2
Document Review; Information gathering; Assumption analysis	2	4.3
Expert Judgment	5	10.9
Expert Judgment; Checklists; Document Review; Information gathering; Assumption analysis	1	2.2
Expert Judgment; Document Review	4	8.7
Expert Judgment; Document Review; Information gathering	3	6.5
Expert Judgment; Document Review; Information gathering; Assumption analysis	6	13.0
Expert Judgment; Information gathering	2	4.3
Expert Judgment; Information gathering; Assumption analysis	1	2.2
Information gathering	2	4.3
Information gathering	9	19.6
Information gathering; Assumption analysis	3	6.5
Total	46	100.0

Source: Own Research (2020)

As indicated in table 4.3.3.2 the primarily applied methods in risk identification were information gathering, checklist, both document review & information gathering, Expert Judgment; Checklists; Document Review; Information gathering; Assumption analysis. This implies that there is no single dominant method used in identifying risk in the organization as a result most of the methods are applied with a slight difference among each method.

Table 4.3.3.3 Participants of risk identification process

Who participated in the risk identification process	Frequency	Percent
Project Manager	1	2.2
Project Manager; End users	2	4.3
Project Manager; Project team members	2	4.3
Project Manager; Project team members; End users	4	8.7
Project Manager; Project team members; End users; Third party consultants	2	4.3
Project Manager; Project team members; Third party consultants	2	4.3
Project team members	7	15.2
Project team members; End users	1	2.2
Third party consultants	2	4.3
Top management members; Project Manager	9	19.6
Top management members; Project Manager; Project team members	5	10.9
Top management members; Project Manager; Project team members; End users	6	13.0
Top management members; Third party	1	2.2
Consultants	2	4.3
Total	46	100.0

Source: Own Research (2020)

Table 4.3.3.4 indicates responses from different respondents about participants in the risk identification process. However, there is no dominant answer with this regard as shown in the table. The most commonly selected stakeholders who participated during the risk identification process were both top management members with project manager weighs to 19.6% followed by project team members which were 15%. So there is no dominant answer here by the participants. But it doesn't mean project participants are identified during the risk identification process.

Table 4.3.3.4 common source of Risk

Common Sources of Risk	Frequency	Percent
Human	1	2.2
Monetary/Financial	6	13.0
Monetary/Financial; Human	4	8.7
Technical	15	32.6
Technical; Environmental	5	10.9
Technical; Human	4	8.7
Technical; Human; Environmental	2	4.3
Technical; Monetary/Financial	3	6.5
Technical; Monetary/Financial; Human; Environment	1	2.2
Technical; Monetary/Financial; Others,	3	6.5
Technical; Others,	2	4.3
Total	46	100.0

As indicated in table 4.3.3.4 above technical risk is identified by the respondents as the most common source of risk in the organization followed by financial and human. This implies technical is the most reoccurring source of risk. Hence, more attention should be given to technical risks by providing training to staff in order to minimize the severity of the risk that could hinder the overall project performance.

4.3.4 Risk Analysis

The study aimed at determining the degree to which project risk analysis was implemented in the study area. The questionnaire consists of three questions for risk analysis. The responses were placed on the five Likert scales where 1 = strongly disagree 2= disagree 3= neutral 4= agree 5 = strongly agree. The results are as presented in Table 4.3.4.1.

Table 4.3.4.1 Risk analysis activities

No.	Activities in Risk Analysis	Mean	Std. Deviation
21	Characteristics of the risk are considered.	3.59	1.045
22	There is a measurement system to analyze the risk.	2.93	1.063
23	Project documents are updated after risk assessment.	3.33	1.012
Grand Mean		3.28	

Source: Own Research (2020)

As table 4.3.4.1 shows that the responses by different respondents about risk analysis practice. The mean result is 3.28 which is a moderate level of risk analysis practice in the study area and all the responses were also moderate. This indicates that characteristics of risk are taken into account, a measurement system is also in place to analyze risk, and project documents are updated after risk assessment.

4.3.5 Risk Response

The respondents were asked three questions with regard to risk response practices in the study area. The responses were placed on the five Likert scale where 1 = strongly disagree 2=disagree 3=neutral 4=agree 5 =strongly agree. The results are as presented in Table 4.3.5.1.

Table 4.3.5.1 Risk response activities

No.	Activities in Risk Response	Mean	Std. Deviation
24	There is a well-developed strategy to respond risk.	2.83	1.161
25	Factors such as budget, schedule and resources and quality are considered while responding to risk.	3.37	1.062
Grand Mean		3.1	

Source: Own Research (2020)

As indicated in table 4.3.5.1 above the mean of risk response practice was 3.1 which is moderate. This result implies that the majority of the respondents agree on the practice of strategy to respond to risk with a mean value of 3.1. Besides, factors such as budget, schedule, and resources and quality are considered while responding to risk.

Table 4.3.5.2 Participants in risk handling

Uncertainties that occur within the project are mostly handled by:	Frequency	Percent
All teams participating in the project	13	28.3
The client	2	4.3
The consultant	3	6.5
The consultant; A risk management section	2	4.3
The project manager	13	28.3
The project manager; A risk management section	2	4.3
The project manager; All teams participating in the project	8	17.4
The project manager; The client; All teams participating in the project	1	2.2
The project manager; The consultant; A risk management section	1	2.2
The project manager; The consultant; The client	1	2.2
Total	46	100.0

Source: Own Research (2020)

As per the participants' response shown in the above table uncertainties that occur within the projects are mainly are handled by the project manager and all teams participating in the project followed by the consultant, client, and other stakeholders. This implies that the majority of project stakeholders have participated in handling risk. Moreover, as per PMBOK, risk management is not a task assigned to a specific department or section.

Table 4.3.5.3 Risk response type

Risk Response type	Frequency	Percent
Valid Acceptance	3	6.5
Avoidance	3	6.5
Avoidance; Acceptance	1	2.2
Avoidance; Transfer	1	2.2
Control/reduction	14	30.4
Control/reduction; Acceptance	3	6.5
Control/reduction; Avoidance	12	26.1
Control/reduction; Avoidance; Acceptance	5	10.9
Control/reduction; Avoidance; Transfer; A	1	2.2
Control/reduction; Transfer	1	2.2
Transfer	2	4.3
Total	46	100.0

Source: Own Research (2020)

As indicated in Table 4.3.5.3 above, four types of risk response respondents were asked to list out the most commonly used in the organization. The result revealed that risk control, avoidance, acceptance, and transfer are used from highest to lowest respectively.

4.3.6 Risk Monitoring and Control

The respondents were asked to the extent to which they agreed with statements about risk response practices in the study area. The responses were placed on the five Likert scales where 1 = strongly disagree 2=disagree 3=neutral 4=agree 5 =strongly agree. The results are as presented in Table 4.3.6.1.

Table 4.3.6.1 Risk monitoring and control activities

No.	Activities in Risk Monitoring and controlling	Mean	Std. Deviation
26	Risks are registered and communicated properly.	3.11	.971
27	Risks are reviewed periodically.	3.04	.893
28	Risk responses are audited	2.89	1.140
29	Project performance is evaluated against risk.	3.09	.985
30	Risks are monitored and controlled appropriately.	3.26	.976
Grand Mean		3.08	

Source: Own Research (2020)

As table 4.3.6.1 indicates that risk planning mean is 3.26 which is moderate level of risk monitoring and control practice and this shows the organization defines risk monitoring and control activities. In addition, there is good progress in participating relevant stakeholders and taking into account environmental factors during risk planning. Similarly, based on the information from the interview the organization is aware of risk planning activities and risk management processes are in place.

CHAPTER FIVE: SUMMARY, CONCLUSION & RECOMMENDATION

5.1 Introduction

This study was aimed at assessing the risk management practice of IT projects conducted in Ethiopian airlines under Digital PMO. This chapter presents the result of findings and recommendations that are forwarded to digital PMO at Ethiopian airlines.

5.2 Summary of Major Findings

The aim of this study was to assess the project risk management of IT projects conducted in Ethiopian airlines under digital division. Out of 54 population size, 46 responded which is 85% population rate. Semi-structured interviews and questionnaires were used to collect primary data.

Hence, the major findings on risk management practice of IT projects in Ethiopian airlines conducted under digital PMO are stated as follow:

- ✚ All the respondents have a good level of educational qualification (BSc and MSc holders) that plays an important role in understanding risk and risk management. However, most of the workforces lack work experience as the majority of the respondents were less than five years work experiences in the organization which is likely to increase the project risk.
- ✚ The practice of most common risk factors and sources of risk in study organization was found moderate according to the respondents view the overall mean was 3.2. However, the organization is still behind the best practice of risk management.
- ✚ Risk management implementation was not fully implemented throughout the project management lifecycle. As per the finding, most of the risk management was implemented in the planning and implementation stage. Even though, risk management implementation is equally important in each stage of the project as per PMBOK best practice.

- ✚ The practice of risk planning in the study area is good with a moderate rate of mean 3.35. In the risk planning process systematic approach was implemented, relevant stakeholders involved, tools like expert judgment were used, other external factors were considered in risk planning and risk management plan was incorporated in the project plan. But as an organization, there is room for improvement to achieve the best risk planning practice.

- ✚ The practice of risk identification was applied by involving project team members, conducting document reviews, and using risk register. Stakeholder register was also used to engage key stakeholders during the risk identification process. The observed finding reveals that the over mean was 3.48 which was a moderate level of risk identification practice.

- ✚ Technical risks were found the most reoccurring risk type by the respondents. Hence, more attention should be given to technical risks by providing training to staff to minimize the severity of the risk that could hinder the overall project performance.

- ✚ Risk analysis practice was moderate with an average mean of 3.28. Risk characteristics were considered, the measurement system was used and project documents were updated after risk assessment. However, still, the result is not enough to reach the best practice.

- ✚ The risk response practice was 3.1 which is moderate. Factors such as budget, schedule, and resources and quality are considered while responding to risk. In addition, the majority of project stakeholders have participated in handling risk. Four types of risk response applied namely, risk control, avoidance, acceptance, and transfer are used from highest to lowest respectively.

- ✚ In the risk monitoring and controlling process the overall mean was 3.08 which was a moderate level of practice. Risks were registered, reviewed, audited, and communicated properly.

5.3 Conclusion

The ultimate purpose of the study was to assess the practice of risk management at Ethiopian Airlines IT projects. The researcher also tried to discuss in detail in the introduction and literature review. Following the findings in chapter four data analysis and description of data, literature review from chapter two, and project management body of knowledge the below conclusion is forwarded with regard to risk management practice of IT projects in Ethiopian airlines under digital PMO.

According to several works of literature and PMBOK, handling of risk is the responsibility of every member of the project team. However, as per the respondents' response, the majority of the uncertainties occurred were handled by project manager along with all teams participated in the projects. In addition, risk management should be implemented all stages of the project management lifecycle from the project planning stage to the project closure stage. But, as per the finding from the respondents, risk management was mostly implemented during the risk planning and implementation stages of projects.

The practice of the risk planning process was rated at a moderate level in the study organization. Risk planning activities in the planning phase was defined, participating relevant stakeholders, environmental factors during risk planning. Similarly, the overall practice of risk identification was found fairly good mean value, and most of the project stakeholders engaged in risk identification. Different tools and techniques are used to identify risk. Information gathering is primarily used method to identify risk followed by checklist, both document review & information gathering, expert judgment, checklists, Document Review; Information gathering; Assumption analysis. The distribution of responses shows that all the mentioned methods were used to identify project risks.

The findings on the risk analysis process show that risk management practice was moderate. Characteristics of the risk were considered, the measurement system was in place and the project document was updated after risk assessment in the study area. There was developed strategy to respond to risk and factors such as budget, schedule, and resources and quality are considered while responding to risk. Different risk response types were used in IT projects which includes a response, control /reduction was primarily implemented to respond risk although there was a circumstance in which each of the risk response types as applicable.

Finally, the findings on risk monitoring and controlling indicate that there were effective risk monitoring and controlling processes within the project, and project performance was not evaluated against risk. There was not transparent communication, periodic review, and response audit of the project risk.

5.3 Recommendation

Overall risk management practice of IT projects in Ethiopian Airlines undertaken digital PMO was fairly good. However, the researcher has made the following recommendations which are expected to reduce unforeseen risks by improving risk management practices that will enable the organization to handle projects on time, with the highest quality and efficient cost-wise.

- ✚ It is recommended to consider that, the existence of more experienced staff in the project is one positive factor to minimize risk by limiting errors and inefficiency. So, it is advisable to hold experienced staff and provide intensive training for new staff to fill the gap.

- ✚ It's recommended to give due attention to mitigating the most common risk factors by taking measures such as..
 - By giving adequate training to project team members and holding an experienced workforce.

- By providing adequate top management support for the project and creating a conducive working environment.
 - By availing enough resources for the project team.
 - Availing the required policy and procedure that guide the project team to guide through a disciplined risk management process.
- ✚ As per PMBOK the implementation of risk management is equally important throughout the project lifecycle. However, as per the respondents it was found that risk management was implemented in planning in the implementation stage. Risk management should be implemented in each stage of the project.
- ✚ The practice of risk planning process was rated moderate level in the study organization. Risk planning activities in the planning phase was defined, participating relevant stakeholders, environmental factors during risk planning. However, the organization is expected to reach highest level of risk planning practice to minimize the risk caused by poor risk planning.
- The overall practice of risk identification was found fairly good mean value and most of the project stakeholders engaged in risk identification. So it is recommended to adopt the practice of benchmark level by carefully considering the following activities related to risk identification.
 - Participating project team members to identify risk.
 - Use risk register to record identified risk.
 - Conduct document review and engage other stakeholders.
 - Technical risks were found the most reoccurring risk type by the respondents. Hence, more attention should be given to technical risks by providing training to staff to minimize the severity of the risk that could hinder the overall project performance.

- The risk analysis was observed moderate. Hence, there is still room for improvement by seriously taking into account risk analysis activities. It is advisable to consider characteristics of risk, measurement system during the risk analysis process, and updating project documents after risk assessment.
- The risk response practice was also moderate. This result implies that the majority of the respondents agree on the practice of strategy to respond to risk. Besides, factors such as budget, schedule, and resources and quality are considered while responding to risk.
- In the risk monitoring and controlling process the overall mean was fairly good which was a moderate level of practice. Risks were registered, reviewed, audited, and communicated. However, more improvement is expected to be done to reach the highest level of practice referred to as a benchmark point.
- Lastly, the overall risk management practice of IT projects in Ethiopian Airlines undertaken by digital PMO was moderate. Risk management is one of the ten body of knowledge areas, so the organization is recommended to give due attention and improve the existing practice to the next which is the benchmark level of risk management practice.
- Last but not the least, more research is recommended in this area mainly in IT projects focusing on the impact of risk management practice in the project success (not addressed here).

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Appendix A: Questionnaire

Addis Ababa University College of Business and Economics School of Commerce Masters of Art in Project Management Questionnaire

Dear Participants,

My name is **Hadera Zeray**, I am a graduate student at Addis Ababa University School of Commerce and currently I am conducting a research for the completion of my masters in project management. This research work is a study to the practice of project risk management practice Ethiopian Airlines.

I kindly request you to participate in this research study by completing the attached questionnaire. In order to ensure that all information will remain confidential please do not include your name anywhere in the questionnaire. I also sincerely request you to respond to the questions as honestly as possible and return the completed questionnaires. Knowing that your time is valuable please, take few minutes of your time to complete the questionnaire.

In case of any question please contact me via “**hadera2009@gmail.com**“or “**0911510298**”

Thank you in advance for your committed cooperation!

Hadera Zeray (The student researcher)

General Instruction and information:

- ✚ Section I includes general information about the respondent
- ✚ Section II includes close-ended questions
- ✚ Section III includes question where it allows you to select more than one answer.
- ✚ Please attempt to answer all the questions.

Section I: General Information

1. Gender: male female
2. Age (in year): 20-29 30-39 40-49 50-59 above 60
3. Level of education: Diploma Bachelor Degree (BA, BSc) MSc and above
4. Years of work experience: Below 2 2-5 6-10 11-15 above 15

5. For how many years have you worked on the project? Below 2 2-5 above
6. Specific role: Officer Project Team Leader Project Manager Developer
Director/Department Manager Other Specify _____

Section II includes question where it allows you to select more than one answer.

A. General questions about Project Risk Management

1. Uncertainties that occur within the project are mostly handled by:

- The project manager
- The consultant
- The client
- A risk management section
- All teams participating in the project

2. Risk management is implemented at which stage of the project?

- Conceptual
- Planning
- Implementation
- Monitor and control
- Closure

B. RISK IDENTIFICATION

3. The following method is primarily used to identify risks within the project:

- Expert Judgment
- Checklists
- Document Review
- Information gathering
- Assumption analysis
- Document Review
- Other, specify: _____

4. Who participated in the risk identification process?

- Top management members
- Project Manager
- Project team members
- End users
- Third party consultants
- Others

C. RISK RESPONSE

5. The risk response strategy used in the project:

- Control/reduction
- Avoidance
- Transfer
- Acceptance

6. Sources of risk that the project usually encounters:

- Technical
- Monetary/Financial
- Human
- Environmental
- Others, specify:____

Section III: close-ended questions

Please encircle the number for the five point scale question that best describes how you perceive project risk management is applied;

Where: **Strongly Disagree (SD) = 1, Disagree (D) = 2, Uncertain (U) = 3, Agree (A) = 4 and Strongly Agree (SA) = 5.**

S.N	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
COMMON PROJECT RISKS IN PROJECT MANAGEMENT						
1	The development team members are adequately trained.					
2	The development team members are well experienced.					
3	There is adequate top management support for the project.					
4	The organizational environment is stable.					
5	Adequate resources are allocated for the project team.					
GENERAL QUESTIONS ABOUT PROJECT RISK MANAGEMENT PRACTICE						
6	The project has a standard risk management process.					
7	There is responsible person or department handle risk.					
8	There is dedicated project management office.					
9	There is a policy and procedure that guide the project team to go through a disciplined risk management process.					
10	Project team have deep project experience in risk management.					
RISK PLANNING						
11	There is systematic approach or					

	careful planning.					
12	Relevant stakeholders are involved in the planning.					
13	Tools like expert judgment, meetings or others are considered for risk planning.					
14	Environmental factors are included as an input to plan for uncertainties.					
15	Project team members receive training or have enough knowledge about how to handle uncertainties.					
16	Risk management plan is incorporated with the project plan.					
RISK IDENTIFICATION						
17	Project team members play roles to identify risk.					
18	Risk register is produced as an output in risk identification process					
19	Documentation review conducted to identify risks.					
20	Stakeholder register used to engage key stakeholders during risk identification process.					
RISK ANALYSIS						
21	Characteristics of the risk are considered.					
22	There is a measurement system to analyze the risk.					
23	Project documents are updated after risk assessment.					

RISK RESPONSE						
24	There is a well-developed strategy to respond risk.					
25	Factors such as budget, schedule and resources and quality are considered while responding to risk.					
RISK MONITOR AND CONTROL						
26	Risks are registered and communicated properly.					
27	Risks are reviewed periodically.					
28	Risk responses are audited					
29	Project performance is evaluated against risk.					
30	Risks are monitored and controlled appropriately.					

Appendix B: Interview Questions

General Interview Guiding Questions

Questions which will be used to guide the semi-structured interview on assessing the project risk management practices of IT projects in Ethiopian airlines digital division.

1. How does the overall project risk management practice looks like in IT Projects in Ethiopian Airlines digital division?
2. How does the overall risk planning practice looks like in Ethiopian Airlines digital division IT projects?
3. How does the overall risk identification practice looks like in Ethiopian airlines IT projects under digital division?
4. How does the overall risk analysis practice looks like in Ethiopian airlines IT projects under digital division?
5. How does the overall risk response practice looks like in Ethiopian airlines IT projects under digital division?
6. How the overall risk monitoring and controlling practice do looks like in Ethiopian airlines IT projects under digital division?
7. How does the overall risk management practice looks like in Ethiopian Airlines IT projects under digital division?

Appendix: C Descriptive Analysis

Common Project Risk factors in Project Management

Descriptive Statistics

Common Project Risk factors in Project Management	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
1. The development team members are adequately trained.	28	2	4	3.50	.793
2. The development team members are well experienced.	28	1	4	3.21	.917
3. There is adequate top management support for the project.	28	1	5	3.25	1.041
4. The organizational environment is stable.	28	1	4	3.29	.897
5. Adequate resources are allocated for the project team.	28	2	5	3.32	.945
	28				

Project Risk Management Practice

Descriptive Statistics

Risk management practice activities	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
6. The project has a standard risk management process.	28	1	5	2.93	1.016
7. There is responsible person or department handle risk.	28	1	5	3.07	1.016
8. There is dedicated project management office.	28	1	5	3.68	.983
9. There is a policy and procedure that guide the project team to go through a disciplined risk management process.	28	1	5	3.14	.970
10. Project team have deep project experience in risk management.	28	1	4	2.93	.900
	28				

RISK PLANNING

Descriptive Statistics

Risk Planning Activities	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
11. There is systematic approach or careful planning.	28	1	4	3.11	.956
12. Relevant stakeholders are involved in the planning.	28	2	4	3.43	.742
13. Tools like expert judgment, meetings or others are considered for risk planning.	28	2	4	3.25	.844
14. Environmental factors are included as an input to plan for uncertainties.	28	2	5	3.50	.923
15. Project team members receive training or have enough knowledge about how to handle uncertainties.	28	1	5	2.93	1.184
16. Risk management plan is incorporated with the project plan.	28	1	5	3.29	1.013

RISK IDENTIFICATION

Descriptive Statistics

Risk Identification	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
17. Project team members play roles to identify risk.	28	2	4	3.36	.870
18. Risk register is produced as an output in risk identification process	28	1	5	3.39	1.133
19. Documentation review conducted to identify risks.	28	1	5	3.29	.937
20. Stakeholder register used to engage key stakeholders during risk identification process.	28	1	5	3.36	1.096

RISK ANALYSIS

Descriptive Statistics

Risk Analysis Activities	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
21. Characteristics of the risk are considered.	28	1	5	3.43	1.168
22. There is a measurement system to analyze the risk.	28	1	5	2.93	1.120
23. Project documents are updated after risk assessment.	28	1	5	3.25	1.110

RISK RESPONSE

Descriptive Statistics

Risk Response Activities	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
24. There is a well-developed strategy to respond risk.	28	1	5	2.82	1.249
25. Factors such as budget, schedule and resources and quality are considered while responding to risk.	28	1	5	3.46	1.105

RISK MONITORING AND CONTROLLING

Risk Monitoring and Controlling Activities	N	Minimum	Maximum	Mean	Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Statistic
26. Risks are registered and communicated properly.	28	1	5	2.93	1.016
27. Risks are reviewed periodically.	28	1	4	2.89	.956
28. Risk responses are audited.	28	1	5	2.79	1.197
29. Project performance is evaluated against risk.	28	1	4	2.89	1.066
30. Risks are monitored and controlled appropriately.	28	1	5	3.21	1.031

