



**ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
SCHOOL OF COMMERCE**

**ASSESSMENT OF SUCCESS AND MAJOR SUCCESS FACTORS IN SOFTWARE
DEVELOPMENT PROJECTS: THE CASE OF COMMERCIAL BANK OF
ETHIOPIA (CBE)**

BY: TAMIRU AYANA

JANUARY, 2025
ADDIS ABABA, ETHIOPIA

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**A RESEARCH PROJECT SUBMITTED TO ADDIS ABABA UNIVERSITY SCHOOL
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FOR THE AWARD OF MASTER OF ARTS IN PROJECT MANAGEMENT**

ADVISOR

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**JANUARY 2025
ADDIS ABABA, ETHIOPIA**

Statement of Declaration

I, the undersigned, hereby declare that the thesis entitled: “Assessment of Success and Major Success Factors in Software Development Projects: The Case of Commercial Bank of Ethiopia (CBE)” has been conducted by me under the guidance and supervision of Seifu Mamo (PhD). I also declare that all materials and sources used for this project research have been accredited appropriately. I am also declaring that this work had not been submitted for the award of any academic Degree or Diploma Program in this or any other institution.

Tamiru Ayana

Signature _____

Date _____

Statement of Certification

This is to certify that **Tamiru Ayana** has carried out this research project work on the topic entitled “Assessment of Success and Major Success Factors in Software Development Projects: The Case of Commercial Bank of Ethiopia (CBE) 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.

Seifu Mamo (PhD)

Signature: _____

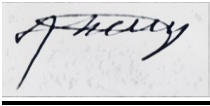
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Approval Page

ASSESSMENT OF SUCCESS AND MAJOR SUCCESS FACTORS IN SOFTWARE DEVELOPMENT PROJECTS: THE CASE OF COMMERCIAL BANK OF ETHIOPIA (CBE)

**By
Tamiru Ayana**

Approved by the Board of Examiners

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Acronyms / Abbreviations

| | |
|---------------|--|
| CBE | Commercial Bank of Ethiopia |
| SBE | State Bank of Ethiopia |
| PM | Project Management |
| PMBOK | Project Management Book of Knowledge |
| IT | Information Technology |
| ATM | Automated Teller Machine |
| ICT | Information Communication Technology |
| IT PMO | Information Technology Project Management Office |
| SPSS | Statistical Package for Social Science |
| NGO | Non-Governmental Organization |
| PMO | Project Management Office |
| KPI | Key Performance Indicator |

Abstract

Countries, organizations, and individuals spend a staggering amount of money on projects every year these days. However, not all money spent returns its value. A significant number of projects fail without delivering what they are intended for because of many reasons. Projects can fail either by not delivering the product requirements or can be abandoned after completion because of change in relevance. Project success is a critical objective across various domains, from construction and engineering to research and development. Software development projects are one type of the projects with low success rates. This research investigates the success rate of software development projects and the key factors influencing success of such projects. The study was a census type which used a primary source of data, collected through a questionnaire with close ended questions and employed a census method to collect information on 21 CBE's in-house developed software projects, all completed or cancelled, from the point of view of three people at different positions for each project. A high success rate of the software development projects (85.7%) has been found by the study. Client/User Involvement, Completed & Accurate Requirements, and Competent & Committed Project Staff were identified as the top three success factors by the study. The findings of the study suggests that the three most relevant parties of a project, the customer, the contractor, and the consultant being under one company yields high success rate of software development projects. But that is not common in reality as only few companies develop their own software. Instead, we can draw one conclusion from this. The playing parties should work as one organization, work very closely and have smooth communications to get such high success rates in projects

Keywords: Project Management, Software Development, Project Success, Success Factors

CHAPTER 1: INTRODUCTION

The aim of this chapter is to provide an overview of the topic and the master thesis itself. Additionally, this chapter discusses the research objectives, the research questions, and the contributions of the research. Lastly, it presents the structure of the master thesis.

1.1 Background of the Study

Billions and trillions of dollars' worth projects are executed annually around the world by nations, institutions, private businesses, and individuals. However, not all projects turn out success or deliver what is intended for. Even though the percentage varies from literature to literature, there is a high percentage of project failure among all type of projects. According to (Djurovic, 2023), at least fifty percent of all project types fail. (Bilir and Yafez, 2022) say that IT projects are one of the project types that have lower success rates. For this reason, many researches have been conducted for decades to study why some projects do fail, what factors influence the performance of a project, and how to improve project performance. Studying project success rates, if possible by project type, is considered as important as knowing the major factors for project success. Knowing project success rate by the project type helps project owners and the contractors in deciding what kind of projects to choose from and the extent of extra care they must take during the planning phase.

Project successes are mostly defined from the perspective of the three popular constraints: time, cost/budget, and scope. CHAOS Report (The Standish Group International, 2015) defines project success, calling it a 'traditional definition', as a project being resolved within a reasonable estimated time, staying within the budget, and containing a good number of the estimated features and functions. The same report also defines project success in a modified version replacing the third factor 'features & functions' by 'delivering customer and user satisfaction'. (Caru et al, 2004) said that customer satisfaction with the overall experience of the executing company is more important and considered as success than finalizing projects in time and according to the budget in the project business. This idea of project success, which mainly considers customer satisfaction, sounds more agreeable except customer satisfaction is not guaranteed even if project is completed according to the scope of the original or updated project plan. Customer satisfaction is a very subjective matter, and it is difficult to measure without bias. This variable capture information only from the customer

side and might undermine the performance of the contractor.

1.2 Background of the Organization

The history of Commercial Bank of Ethiopia (CBE) dates to the establishment of the State Bank of Ethiopia in 1942. CBE was legally established as a share company in 1963. Since then, it has been playing significant roles in the development of the country. Currently CBE has more than 40+ million account holders in its more than 1940+ branches and the number of Mobile and Internet Banking users also reached more than 6.6 million and 37 thousand, respectively. Active ATM card holders reached more than 8.3 million while 17 million people use CBE Birr. (Commercial Bank of Ethiopia, about page - Commercial Bank of Ethiopia, accessed on 27 April 2024)

After the Ethiopian victory over Italy during World War II, the new government (of Ethiopia) issued a proclamation on 26 August 1942 that established the State Bank of Ethiopia (SBE). SBE commenced full operations on 15 April 1943 with two branches and 43 staff. It served both as Ethiopia's central bank, with the power to issue banknotes and coins as the agent of the Ministry of Finance, and as the principal commercial bank in the country. In 1945 the Ethiopian government granted the bank the sole right of issuing currency. The first governor of the bank was an American, George Blowers. He inaugurated the new national currency, which owed its successful introduction to the United States. The United States provided the silver for 50-cent coins, whose intrinsic value ensured popular acceptance of the new paper money to a population used to the circulation of the silver Maria Theresa thaler. In 1958, the State Bank of Ethiopia established a branch in Khartoum, Sudan. Over time SBE's branch network grew to number 21 branches.

In the 1950s, SBE established a branch in Djibouti. In 1920 the Bank of Abyssinia had opened a transit office in Djibouti. At some point after the creation of the State Bank of Ethiopia it reopened the transit office, which in time became a branch of CBE in 1969.

In 1963, the Ethiopian government split the State Bank of Ethiopia into two banks, the National Bank of Ethiopia (the central bank), and the Commercial Bank of Ethiopia (CBE). Seven years later, the Sudanese government nationalized the Commercial Bank of Ethiopia's branch in Khartoum that had originally been the Sudan branch of SBE.

The Ethiopian government merged Addis Bank into the Commercial Bank of Ethiopia in 1980 to make CBE the sole commercial bank in the country. The government had created Addis Bank from the merger of the newly nationalized Addis Ababa Bank, and the Ethiopian operations of the Banco di Roma and Banco di Napoli. Addis Ababa Bank was an affiliate that National and Grindlays Bank had established in 1963 and of which it owned 40%. At the time of nationalization, Addis Ababa Bank had 26 branches. The merger of Addis Ababa Bank with CBE made CBE the sole commercial bank in Ethiopia, with 128 branches and 3,633 employees.

In 1991, when Eritrea achieved its independence, the Eritrean government nationalized the branches there. In 1994 these branches formed the basis for what became the Commercial Bank of Eritrea. Also in 1994, the Ethiopian government reorganized and reestablished CBE. In 2004, CBE closed its branch in Djibouti due to problems with loan losses.

In January 2009, CBE received regulatory approval to open a branch in Juba, Southern Sudan. CBE expanded its presence in South Sudan to five branches in Juba and Malakal, but ongoing conflict in the country has forced CBE to close all but two branches in Juba.

In February 2022, the government restructured CBE and signed a contract with Royal Bank of Scotland for management consultancy services. After the death of its former President Gezahegn Yilma, the Board of Management appointed Abie Sano as a new President of the Bank. The Parliament recently increased the bank's capital to 4 billion Ethiopian birr. The bank has reached 1950 branches as of 24 April 2024. (Wikipedia contributors, 2024b)

The Commercial Bank of Ethiopia (CBE), as one of the largest and most prominent financial institutions in the country, has increasingly embraced technology to enhance its services, streamline operations, and remain competitive in the digital banking era. The practice of software development projects within CBE reflects a strategic focus on digital transformation, customer-centric solutions, and operational efficiency.

Digital Transformation and Innovation: CBE has been actively investing in software development projects to modernize its banking systems and improve customer experience. The bank has adopted core banking systems, mobile banking platforms, and online payment solutions to cater to the

growing demand for digital financial services. For instance, the introduction of the CBE Birr mobile banking application has significantly increased financial inclusion, allowing customers to conduct transactions remotely (CBE Annual Report, 2022).

Agile and Collaborative Development Practices: In recent years, CBE has shifted towards agile methodologies in its software development projects. This approach emphasizes iterative development, collaboration, and flexibility, enabling the bank to respond quickly to changing customer needs and market trends. Agile practices have also improved project management and reduced time-to-market for new software solutions (Abebe & Tadesse, 2021).

Challenges in Software Development: Despite its progress, CBE faces several challenges in its software development projects. These include: -

Legacy Systems: The bank still relies on some outdated systems, which can hinder integration with modern technologies.

Skill Gaps: There is a need for continuous training and upskilling of IT staff to keep pace with emerging technologies.

Cybersecurity Risks: As digital services expand, ensuring the security of software systems has become a critical concern (Tsegaye & Mekonnen, 2020).

Strategic Partnerships and Outsourcing: To address these challenges, CBE has engaged in strategic partnerships with global technology firms and local software developers. Outsourcing certain aspects of software development has allowed the bank to leverage external expertise while focusing on its core banking operations. For example, collaborations with companies like IBM and Oracle have facilitated the implementation of advanced banking solutions (CBE Strategic Plan, 2021-2025).

1.3 Statement of the Problem

PMBOK (PMI, 2017) indicates that determining whether a project is successful or not is one of the most common challenges in project management. Project management has become progressively more important in the growth of any nation. Various organizations have used project management techniques as a means of bridging the gap between failure and success in the implementation of projects. Regardless of this increasing awareness of project management by organizations, projects still fail.

Project management is being regarded as mandatory for the survival and success of projects such as the ones being studied. Projects, be it a government project, private or NGO project, usually encounter many problems in developing countries in general and in Ethiopia in particular.

Project management is a set of tools, techniques, and knowledge that, when applied, helps to achieve the three main constraints of scope, cost and time (Charvat, 2003). However, based on literatures, 52.7% of projects were not able to complete on time and over cost, and 31.1% not fulfilled the scope (Charvat, 2003 and Clancy, 1995).

Previous studies have reported that there is a high failure rate of software projects. The tasks of keeping projects within scope, on schedule and within budget to satisfy customers are increasing. Despite technological advancement, the failure rates of projects can range from 18% to a high of 50% (Miller, 2024). Failure rates of this magnitude have highlighted the reason why the subject of increased effectiveness continues to be an area of research and why it is important to investigate project management competency (Gelbard and Carmeli, 2009; Nwagbogwu, 2011).

The CHAOS reports from the Standish Group have consistently highlighted the high failure rates and cost overruns in software projects. These failures translate into substantial financial losses for organizations. This directly impacts the economic viability of organizations, according to Chaos Report (The Standish Group, 2015). Identifying the major factors leading to project success and understanding the factors contributing to failures is essential to mitigate these losses. Research on project success factors emphasizes the need for effective resource management, optimizing resource allocation, ensuring that investments are aimed towards activities that yield the highest returns. This

leads to increased efficiency and productivity. This also contributes to the body of knowledge in the management of software development projects.

The writer of this study had not seen any research conducted on project success rates specific to Ethiopia. This paper tries to fill this gap bearing in mind that knowing how software development projects are performing in terms of meeting their goals, and against the three popular project management constraints.

1.4 Research Questions

- ✓ What is the success rate of software development projects in Commercial Bank of Ethiopia (CBE)?
- ✓ What are the most common factors that affect the success of software development projects in case of Commercial Bank of Ethiopia (CBE)?
- ✓ What are the top three factors among the identified in affecting the success rate?

1.5 Objectives of the Study

1.5.1 General Objective of the Study

- The general objective of the study is to assess the success rate and the major success factors in software development projects in the case of Commercial Bank of Ethiopia (CBE).

1.5.2 Specific Objectives of the Study

Below are the specific objectives of this study:

- ✓ To assess the success rate of software development projects in Commercial Bank of Ethiopia (CBE).
- ✓ To identify the main factors affecting success of software development projects in Commercial Bank of Ethiopia (CBE) case.

- ✓ To weigh the success factors and identify the top three among them.

1.6 Significance of the Study

This study will have quite a significance for the organization under study in particular, and other organizations engaged in software development projects directly or indirectly in general. This study at first was planned to be conducted on many organizations from all over the country including government and private organization which are involved in software development as a contractor, a client, or a consultant in the process. However, due to many reasons such as financial, technical and time constraint issues, it was later decided to be conducted on one organization namely Commercial Bank of Ethiopia. CBE has many-years of developing its own applications to modernize and facilitate its activities.

Even though many organizations do not develop their own applications, the results found in this study will contribute to any organization that is involved in software development from their standing point, whether as a client, developer, or consultant. The student conducting this study had not seen other works done in the country which focused on success of software development projects.

There are some related researches conducted in the country which focused on assessing success factors and practice of software development projects. However, their focus area is a bit different from this study. For this reason, there is a gap that this study can fill in this regard.

This research also tries to identify the main factors for a success of software developments projects which will add knowledge on previous related works. Moreover, CBE can use this work to see itself for future improvement and conducting more successful software development projects.

1.7 Scope of the Study

The study has been planned to be conducted on Commercial Bank of Ethiopia (CBE) focusing on in-house built applications (developed by a department of the organization), client departments, and internal consultants. In the case of this study all the contractor, client and the consultant are part of the bank. The study will use both descriptive and exploratory research designs using cross-sectional data that will be collected for the purpose of this study.

1.8 Limitations of the study

It is planned to put a lot of effort in this study. It will be tried to include as many projects as possible. This study focuses only on one organization which is CBE, and the applicability and inferencing power of the findings is limited to this organization.

1.9 Organization of the Paper

This study paper is comprised of five chapters. The first part illustrates introduction, the background of the study, statements of the problem, basic research questions, objectives, significance, scope, and limitation of the study. The second chapter concerned with theoretical and review of related literature and the conceptual framework of the study. The third chapter describes research design and methodology of the study and the analysis used. Results and discussions would be discussed in the fourth chapter. Finally, research major findings, conclusions, and recommendations will be covered in the fifth chapter.

CHAPTER 2: REVIEW OF RELATED LITERATURES

The objective of this chapter is to see how literatures define success of a project in general and a successful software development project in particular. It also assesses what important factors lead to success of software development projects.

2.1 Introduction

Software development projects are critical to the success of organizations in the digital age, enabling innovation, efficiency, and competitive advantage. However, these projects are often complex, resource-intensive, and prone to failure. Chaos Report (The Standish Group, 2020) highlights that a significant percentage of software projects fail to meet their objectives, either exceeding budgets, missing deadlines, or failing to deliver expected value. This underscores the importance of assessing project success and understanding the factors that contribute to it.

The assessment of success in software development projects is multifaceted, encompassing technical, business, and process dimensions. While traditional metrics such as time, cost, and scope remain relevant, modern approaches emphasize stakeholder satisfaction, organizational benefits, and long-term impact. This literature review explores theoretical and empirical perspectives on the topic, identifies key success factors, and highlights gaps in the existing research. By synthesizing insights from academic and industry sources, this review aims to provide a comprehensive understanding of what constitutes success in software development projects and how it can be achieved.

In-House Software Development: In-house system development refers to a scenario where the supplier is also the customer, with the system being created for the internal use of a company or organization. Such in-house relationships can emerge from three distinct situations: addressing the requirements of a business center within the same organization, catering to the specific needs of a particular business function, and fulfilling the requests of colleagues within the same business unit (Macaulay, 1996).

When addressing the needs of a business center within the same organization, one department

acts as the customer, seeking a necessary system from the supplier, typically the IT department of the organization. This system is often developed to comply with new governmental regulations, for instance (Macaulay, 1996). The development process in this context resembles that of a bespoke system; however, a notable challenge may arise due to internal barriers that can hinder user accessibility (Macaulay, 1996).

In the case of responding to the needs of a specific business function, a department requests a new system tailored to its requirements from the IT department within the same organization. Similar to the previous scenario, the system is developed in a manner akin to bespoke systems. This relationship tends to foster a strong collaborative dynamic between the customer and the supplier (Macaulay, 1996).

2.2 Theoretical Literature

Theoretical literature provides the foundational concepts and frameworks for understanding project success and the factors that influence it. These theories offer insights into the definition of success, the role of project management, and the interplay of technical, human, and organizational factors.

2.2.1 Definition of Project Success

Many literatures have tried to answer what a successful project is and yet there is no a single definition that is agreed upon by all the people in the area. (Hyvari, 2006) said that it's a surprise that in the project management literature it is still somewhat unclear what makes a successful project in general, and, in particular, in the terms of organizational context of the company or companies involved. The concept of project success has not been well-defined anywhere in project management literatures. There does not appear to be any agreed-upon understanding of the concept of success in either business or project management literature. PMBOK6 (PMI, 2017) says that determining whether a project is successful or not is one of the most common challenges in project management. The traditional project management metrics of time, cost, scope, and quality have been the most important factors in defining the success of a project. More recently, practitioners and scholars have determined that project success should also be

measured with consideration toward achievement of the project objectives. Project stakeholders may have different perceptions as to what the successful completion of a project will look like and which factors are the most important.

Some authors like (Baccarini, 1999) tried to make the question about successful project less difficult to answer by dividing it into two separate components: Project Management Success and Product Success. The first component, which is almost similar to the old project success definition, focuses on the project process and the successful accomplishment of the project against the planned cost, time and quality objectives. This also considers the way the project management process was conducted. The second component which is product success deals with the effects of the project's final products.

(Baccarini, 1999) argues that it is common for a project management literature to confusingly intertwine these two separate components of project success and present them as a single homogenous group. In order to properly define and assess project success, a distinction should be made between product success and project management success, as they are not the same. Conceptually, the determination of project management success disregards product success, e.g., a project has been managed efficiently but eventually does not meet customer or organizational expectations (Shenhar et al, 1997).

2.2.2 Success Factors

Theoretical literature identifies several categories of factors that contribute to the success of software development projects. Project management theories, such as the Project Management Body of Knowledge (PMBOK) by (PMI, 2017), emphasize the importance of planning, execution, and control. These theories highlight the role of clear objectives, effective scheduling, and risk management in achieving project success.

Agile and lean theories offer a different perspective, focusing on iterative development, customer collaboration, and adaptability. (Schwaber and Sutherland, 2020), the creators of the Scrum framework, argue that success in software projects depends on the ability to respond to changing requirements and deliver incremental value. This approach contrasts with traditional

waterfall methodologies, which prioritize rigid planning and linear execution.

Systems theory provides another lens for understanding software project success. This perspective views software development as a complex system involving technical, human, and organizational components. (Sommerville, 2011) argues that success depends on the effective integration of these components, as well as the ability to manage interdependencies and emergent properties.

2.3 Empirical Literature

The success rate of software development projects has been a topic of significant interest in both academia and industry. Despite advancements in methodologies, tools, and practices, a substantial number of software projects fail to meet their objectives. CHAOS Report (The Standish Group, 2015) highlights that only 29% of software projects are successful, while 19% are outright failures, and 52% are challenged (delivered late, over budget, or with reduced functionality). This empirical literature review examines the success rates of software development projects and identifies the major success factors that contribute to positive outcomes, drawing on evidence from recent studies and industry reports.

2.3.1 Success Rates in Software Development Projects

Empirical studies consistently reveal that the success rate of software development projects remains low, despite decades of research and practice. The Standish Group's CHAOS Report (2015) is one of the most widely cited sources, providing a benchmark for success rates across industries. According to the report, the success rate has improved marginally over the years, but a significant proportion of projects still fail to meet their goals. Similarly, (Bilir and Yafez, 2022) conducted a study in Turkey and found that only 35% of software projects were considered successful, with the majority facing challenges related to scope creep, budget overruns, and missed deadlines.

(Djurovic, 2023) provides updated statistics, indicating that 70% of projects fail to deliver on time, and 45% exceed their budgets. These findings are consistent with earlier studies, such as (Linberg, 1999), who found that software developers often perceive project failure as a result

of poor requirements gathering and inadequate planning. The persistent low success rate underscores the need to identify and address the factors that contribute to project success.

2.3.2 Major Success Factors in Software Development Projects

Empirical research has identified several key factors that influence the success of software development projects. These factors can be categorized into project management, team dynamics, technical practices, and organizational support.

Project Management Factors: Effective project management is consistently identified as a critical success factor. (Carù et al, 2004) conducted a case study on the Andria project and found that clear objectives, detailed planning, and risk management were essential for success. Similarly, (Baccarini and Collins, 2004) surveyed project managers and found that projects with well-defined goals and realistic timelines were more likely to succeed.

The adoption of agile methodologies has also been shown to improve success rates. (Strode, 2017) examined coordination effectiveness in agile software development and found that iterative development, continuous feedback, and customer collaboration significantly enhanced project outcomes. These findings are supported by (The Standish Group, 2015), which reported that agile projects have a higher success rate compared to traditional waterfall projects.

Team Dynamics and Human Factors: Team dynamics and human factors play a crucial role in project success. (Gelbard and Carmeli, 2009) studied the interactive effects of team dynamics and organizational support and found that cohesive teams with strong communication and collaboration skills were more likely to deliver successful projects. (Hyvari, 2006) also emphasized the importance of leadership and stakeholder involvement, noting that projects with engaged stakeholders and effective leadership were more likely to meet their objectives.

(Beleiu, 2015) identified skilled teams as a key success factor, highlighting the importance of technical expertise and problem-solving abilities. Empirical evidence suggests that teams with diverse skill sets and a shared commitment to project goals are better equipped to handle challenges and deliver high-quality software.

Technical Practices: Technical practices, such as quality assurance and technology selection, are critical for project success. (Pressman, 2014) found that rigorous testing and adherence to coding standards significantly reduced defect rates and improved software quality. Similarly, (Macaulay, 1996) emphasized the importance of requirements engineering, noting that poorly defined requirements were a major cause of project failure.

The use of modern tools and technologies has also been shown to enhance success rates. (Guo, 2019) conducted a qualitative content analysis of information system projects and found that the adoption of advanced tools, such as automated testing and continuous integration, improved project outcomes. These findings are consistent with the growing emphasis on DevOps practices, which aim to streamline development and operations processes.

Organizational Support: Organizational support is another critical factor in project success. (Zwikael and Smyrk, 2019) found that management commitment and resource allocation were essential for achieving project goals. (Nwagbogwu, 2011) also highlighted the role of organizational culture, noting that projects aligned with cultural values were more likely to gain acceptance and support.

(McArthur and Robin, 2019) examined the impact of organizational support on project success and found that projects with strong executive sponsorship and adequate funding were more likely to succeed. These findings underscore the importance of aligning software projects with organizational priorities and ensuring that they receive the necessary resources and support.

2.3.3 Assessment Methods

Empirical studies have explored various methods for assessing the success of software development projects. Quantitative metrics, such as defect rates, delivery timelines, and budget adherence, are commonly used to evaluate project performance. (Kerzner, 2017) recommends using Key Performance Indicators (KPIs) to track progress and identify areas for improvement.

Qualitative approaches, such as stakeholder interviews and post-implementation reviews, provide insights into user satisfaction and business impact. (Zwikael and Smyrk, 2019) argue

that these methods are particularly useful for assessing intangible outcomes, such as organizational learning and innovation.

Agile assessment methods, such as sprint reviews and customer feedback, are increasingly used in software projects. (Rubin, 2012) provides evidence that these methods enable continuous improvement and ensure alignment with customer needs.

2.4 Research Gaps

Despite the extensive body of research on software project success, several gaps remain. One major gap is the lack of a standardized framework for assessing success. While numerous metrics and methods have been proposed, there is no universally accepted approach, leading to inconsistent practices across organizations.

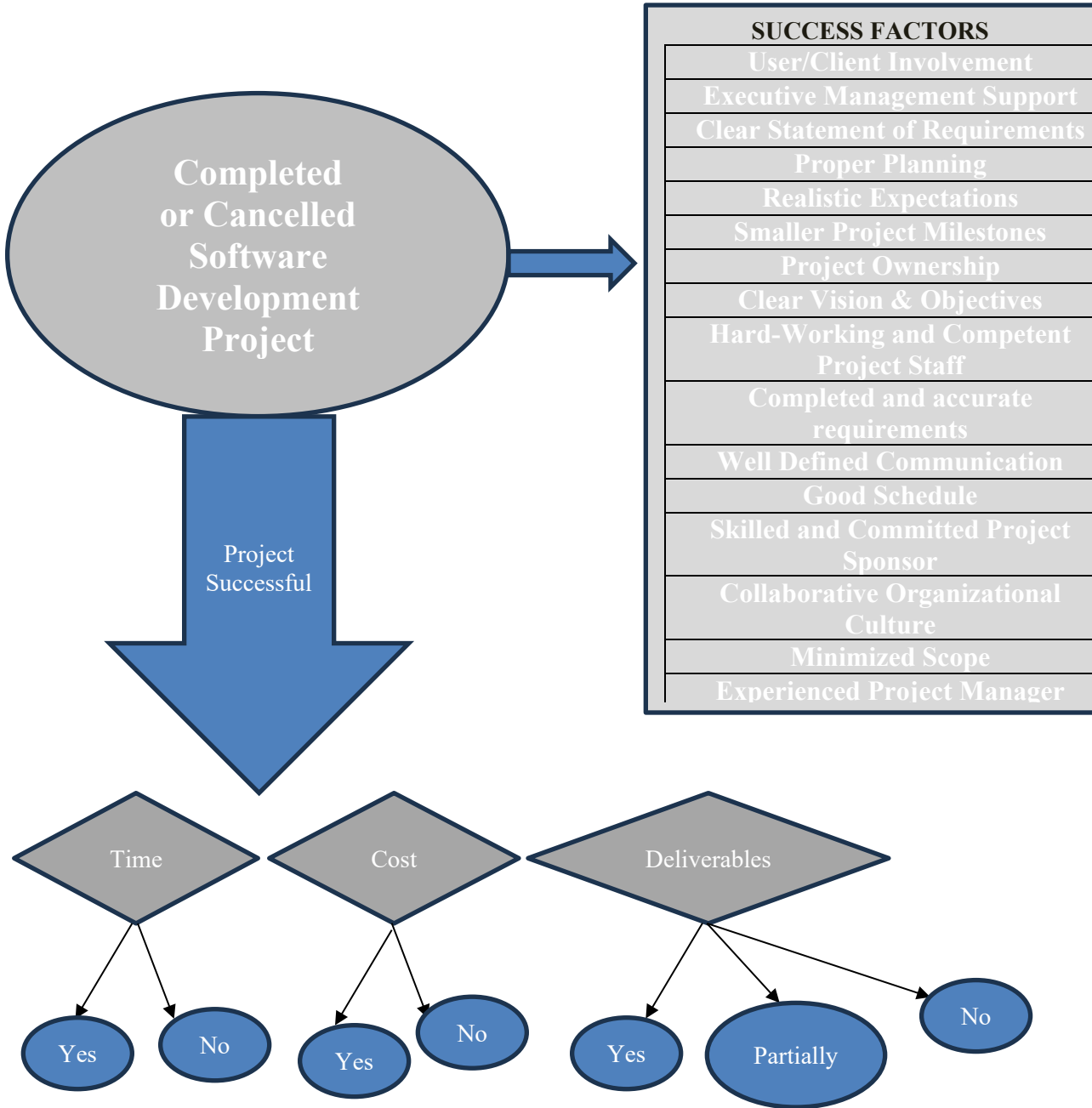
Another gap is the limited focus on long-term impacts. Most studies assess success in terms of short-term outcomes, such as project delivery and user satisfaction. However, the long-term benefits of software projects, such as organizational learning and innovation, are often overlooked.

Emerging technologies, such as AI and DevOps, present another area for future research. While these technologies have the potential to transform software development, their impact on project success is not well understood. Finally, most research is conducted in Western contexts, leaving a gap in understanding how cultural and regional factors influence success.

In case of Ethiopia, the author of this study was not able to find any work related to the subject matter of this research. More research works on similar subject have to be done in our country to help the government and private investors in gaining knowledge in the area.

2.5 Conceptual Framework

The following conceptual framework has been used for this study.



CHAPTER 3: RESEARCH METHODOLOGY

This part of the paper focuses on the methodology used in this study. It outlines how the research was conducted based on the objective of the study. It includes and is organized in the order of research design, description of study variables, description of study area and target population, sampling technique/methods and sample size, data collection, data analysis, reliability and validity analysis, and finally ethical consideration.

3.1 Research Design

Mixed methods research, both quantitative and qualitative research design, would be used in this study. (Tashakkori and Teddlie, 2013) say that mixed methodologies offer enhanced opportunities for addressing research questions, enabling a more thorough assessment of the reliability of research findings and the validity of the inferences drawn from them. Therefore, it is reasonable to use multiple designs for assessing the performance of in-house developed software projects in Commercial Bank of Ethiopia.

Mixed methods research integrates various techniques and methodologies from both qualitative and quantitative research paradigms. In this approach, the emphasis is placed on the defined problem rather than the specific method employed (Johnson and Onwuegbuzie, 2004). This grants the researcher the freedom to select from a wide array of methods, techniques, and other approaches without any restrictions. Such flexibility forms the foundation for pragmatic knowledge assertions, which are employed in mixed methods research. In order to effectively utilize mixed methods, it is essential for the researcher to comprehend the strengths and weaknesses associated with both qualitative and quantitative research approaches, a concept referred to as the foundational principle of mixed research (Tashakkori and Teddlie, 2003).

3.2 Description of study variables

People who previously worked in at least one software development project of the organization (CBE) at any position will be considered in this study. The project should not be under development; it has to be completed or terminated after start. The participants would be from all the contractor, client, and consultant sides (departments or another organization). There would be a balance among

the sides. Project directors, project managers, project team members, and personnel management would be selected for the study. The study uses purposive sampling technique. Since the research is a cross-sectional study mainly focusing on “success rate of software development projects” the participants would be the forementioned staff who have previous participation in at least one completed project or a project terminated after starting. Selection will be based on the judgement of the researcher.

3.3 Description of study area and target population

The population in this study is CBE IT department, Project Office, and other relevant departments which had any experience in getting software developed within the organization.

3.4 Sampling technique/methods and sample size

In this study the researcher would use non-probability sampling technique. According to (Saunders et al, 2009), non-probability sampling offers various alternative methods for selecting samples based on the researcher's subjective assessment. Among these techniques, the purposive sampling method is particularly utilized. This approach, also known as judgmental sampling, allows the researcher to apply their judgment in choosing cases that are most likely to facilitate the answering of research questions and achieving research objectives.

3.5 Data collection – source, types, instruments, etc.

The source of data in the study would be a primary data collected through the questionnaire designed by the researcher. The primary data would be collected through personal interviews from the selected participants.

3.6 Data analysis – model, techniques, software, etc.

The information gathered through the questionnaire will undergo analysis for descriptive statistics such as the mean, frequency, percentage, and standard deviation for the variables related to demographic characteristic of the respondent. Success rate of the projects will be calculated by dividing the sum of successful projects and partially-successful projects by total sum of projects. ‘Successful Projects’ is to mean software which met all the requirements of the project when

completed & delivered; while ‘Partially Successful’ also called ‘Challenged’ are software which met only some of the requirements during completion but still functional. Identifying the most important success factors is calculated using frequency of the responses. In this study, 21 CBE in-house software development projects have been considered. A two-year limited time frame was selected after discussing with the individual who was leading the department for reasons like availability of people participated in the projects and avoiding recall biases. Twenty-one completed or cancelled projects have been found in the selected time frame. All these projects have been assessed from the point of view of people who participated in the projects at different functions. That means this study is rather a census. A total of 19 people, 9 software developers, 6 requirement analysts / testers, and 4 project managers have participated with answering the questionnaire. The researcher himself conducted the data collection by interviewing all the respondents. The data was captured directly on a questionnaire developed on KoboToolbox application. The collected data was later exported as an excel file for data cleaning. Finally, the cleaned and coded data was imported into SPSS software version 25 for analysis and data visualization.

3.7 Reliability and validity analysis

3.7.1 Validity

Validity refers to the extent to which measurement of an instrument actually measure what is intended to measure. It is fundamentally linked to the degree to which research data and the methods employed to obtain that data are precise, truthful, and relevant (Denscombe, 2010). To gather pertinent information, meticulous planning is essential to ensure that the data collected aligns with the research objectives and is sourced from individuals most qualified to provide such information. The acquisition of complete and accurate data necessitates well-designed data collection tools and effective survey administration techniques. Validity pertains to the extent to which a method accurately measures what it is intended to assess. High validity in research indicates that the results reflect genuine characteristics, attributes, and variations present in the physical or social environment.

3.7.2 Reliability

Reliability in this context refers to the internal consistency or dependability of a measuring tool. Reliability pertains to the criterion employed to assess the consistency of research outcomes. As noted by (Sekaran and Bougie, 2009), the reliability of a measurement is determined by evaluating the stability and consistency of the data collected. To enhance the reliability of the research findings, the researcher crafted the interview questions, focus group discussions, and observations in a straightforward and concise manner, thereby minimizing potential confusion among key informants.

3.8 Ethical Consideration

The ethical considerations pertinent to scientific research were duly addressed in this study. The researcher is committed to maintaining the quality and integrity of the project. Participants provided informed consent, fully understanding the nature of their involvement. The findings of the study are based on the data supplied by the respondents, as well as qualitative information obtained through interviews ensuring a realistic and unbiased process. Furthermore, the researcher sought consent from the interviewees and assured them of the confidentiality of the information collected for the purpose of this study.

CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

This chapter aims at presenting, analyzing and interpreting the results of the data collected through the questionnaire. The demographic characteristics of the respondents will be analyzed first followed by the analysis of the main parts of the study which try to answer the objectives of the study. SPSS statistical software version 25 is used to do the data analysis. findings of the research.

In this study, 21 CBE in-house software development projects have been considered. A two-year limited time frame was selected after discussing with the individual who was leading the department for reasons like availability of people participated in the projects and avoiding recall bias. Twenty-one completed or cancelled projects have been found in the selected time frame. All these projects have been assessed from the point of view of people who participated in the projects at different functions. That means this study is rather a census. A total of 19 people, 9 software developers, 6 requirement analysts / testers, and 4 project managers have participated with answering the questionnaire. The researcher himself conducted the data collection by interviewing all the respondents. The data was captured directly on a questionnaire developed on KoboToolbox application. The collected data was later exported as an excel file for data cleaning. Finally, the cleaned and coded data was imported into SPSS software version 25 for analysis and data visualization.

4.1 Demographic Information of the respondents

This section provides an overview of the demographic attributes of the respondents, encompassing factors such as gender, age, educational attainment, area of expertise, and professional experience within the projects. The primary objective of the demographic analysis in this study is to delineate the characteristics of the respondents, thereby enhancing the significance of the analysis for the audience.

Here respondents are analyzed by sex, age, education, years of professional in software industry, number of software projects participated in, and position at company the time of the study.

Table 4.1 Frequency Table Showing Characteristics of the Survey Respondents

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|--|------------------------|------------------|----------------|----------------------|---------------------------|
| Gender | Male | 14 | 73.7 | 73.7 | 73.7 |
| | Female | 5 | 26.3 | 26.3 | 100 |
| | Total | 19 | 100 | 100 | |
| Age Group | 21-30 | 11 | 57.9 | 57.9 | 57.9 |
| | 31-40 | 5 | 26.3 | 26.3 | 84.2 |
| | 41-50 | 3 | 15.8 | 15.8 | 100 |
| | Total | 19 | 100 | 100 | |
| Education | Bachelor degree | 11 | 57.9 | 57.9 | 57.9 |
| | Master degree | 8 | 42.1 | 42.1 | 100 |
| | Total | 19 | 100 | 100 | |
| Professional Experience with software development | 2-4 Years | 3 | 15.8 | 15.8 | 15.8 |
| | 5-7 Years | 8 | 42.1 | 42.1 | 57.9 |
| | 8-10 Years | 3 | 15.8 | 15.8 | 73.7 |
| | >10 Years | 5 | 26.3 | 26.3 | 100 |
| | Total | 19 | 100 | 100 | |
| Number of projects have participated in | 2-4 Projects | 4 | 21.1 | 21.1 | 21.1 |
| | 5-7 Projects | 7 | 36.8 | 36.8 | 57.9 |
| | 8-10 Projects | 2 | 10.5 | 10.5 | 68.4 |
| | >10 Projects | 6 | 31.6 | 31.6 | 100 |
| | Total | 19 | 100 | 100 | |
| Current position at company | Project Manager | 4 | 21.1 | 21.1 | 21.1 |
| | Developer | 9 | 47.4 | 47.4 | 68.4 |
| | Software Tester | 6 | 31.6 | 31.6 | 100 |
| | Total | 19 | 100 | 100 | |

Source: (Survey result and own computation, 2024)

Analyzing the 19 respondents by sex, the majority were males constituting 74% of all the total respondents while the females constitute only 26%. That might be the reflection of the human power in the software development industry. Age wise, most of the respondents were in their twenties. They constituted 57.9% followed by the respondents in the thirties with 26.3%. Relatively the smaller group are the respondents with ages above 40 who cover the remaining 15.8% of the total respondents. About fifty eight percent of respondents had first degree level education while the remaining 42% had masters level education. The participants were also asked about their work experience: position at the company, years in professional software development, and total number of software development projects they had participated in. Function wise, there were 47.4% software developers, 31.6% software testers /requirement analysts, and 21.1% project managers. About 42% of the study participants had 5-7 years in professional software development. Similarly, 26% of the participants who were mostly project managers had more than ten years of professional experience while respondents who had 2-4 years and 8-10 years both constitute 16% each. Considering the respondents by their participation in such projects, 36.8% in 5-7 projects, 31.6% in more than 10 projects, 21.1% in 2-4 projects, and 10.5% in 8-10 projects.

4.2 Descriptive Statistics

This section tries to present the findings of the research by analyzing the data. The primary objective of the study is to determine the success rate of software development projects, specifically in-house developed software projects, in the case of Commercial Bank of Ethiopia (CBE). The other objectives are identifying the main factors for success of such projects in Commercial Bank of Ethiopia (CBE) and to point out the top three among them. We see success of the projects from the perspectives of the three constraints. Also, success factors are analyzed based on the role/position of the respondent and the length of professional experience in years, to see if there are any significant differences.

4.2.1 Success Rate of Software Projects Studied

In this section the software development projects studied will be analyzed against the three main constraints, namely, time, cost, and scope or deliverables.

Table 4.2 Table Showing if the Project Was Delayed or Not
 Was the project completed on time without any delay from the estimated project completion time?

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 38 | 60.3 | 60.3 | 60.3 |
| | No | 25 | 39.7 | 39.7 | 100.0 |
| | Total | 63 | 100.0 | 100.0 | |

Source: (Survey result and own computation, 2024)

Table 4.3 Table Showing if the Project Was Within Budget or Not
 Was the project within the budget when it is completed?

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | Yes | 51 | 81.0 | 81.0 | 81.0 |
| | No | 12 | 19.0 | 19.0 | 100.0 |
| | Total | 63 | 100.0 | 100.0 | |

Source: (Survey result and own computation, 2024)

When we consider the time constraint, 60.3% of the projects were completed within the pre-planned timeline. Cost wise, according to the respondents, 81% of the projects were successful meaning no extra cost was spent on the projects. However, this statement should be carefully put. It is because other situations should be considered before reaching a conclusion. We will come to it late in this section.

Table 4.4 Table Showing if the Project Had Fully Delivered, Partially, or Not
 Had the project been delivered with all the specifications/functionalities previously defined in the project scope?

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------------------------------------|-----------|---------|---------------|--------------------|
| Valid | Yes | 48 | 76.2 | 76.2 | 76.2 |
| | No but Project Delivered & In Use | 6 | 9.5 | 9.5 | 85.7 |
| | Project Canceled or Never Been Used | 9 | 14.3 | 14.3 | 100.0 |
| | Total | 63 | 100.0 | 100.0 | |

Source: (Survey result and own computation, 2024)

Considering the third constraint, which is the deliverables or the software features in our case, we have divided the achievements in three. The first group are the projects which have delivered all the desired software features and functionalities. About 76.2% of the projects fall in this group. The second group constitutes 9.5% of the projects which were delivered to the client with partial features and became functional. In the last group are the projects that were canceled after development started or abandoned by the client after completion. 14.3% of the projects fall in this group.

Interpreting the survey results mentioned above, only 60.3% of the projects were successful in terms of time. That is the smallest success rate compared to the success rates calculated against cost and scope constraints. The biggest achievement (81%) was when calculated against cost. What we have to consider here is that there is a significant difference between the responses of project managers and the other two groups, namely code developers & testers. As it can be seen from the table below, the success rate of the projects against cost/budget according to project managers was calculated to be only 61.9% compared to 90.5% of the other groups.

Table 4.5 Survey Respondents’ Answers for Project Performance Against Budget by Position of the Respondent

| Was the project within the budget when it is completed? | Position | | | Total |
|---|-----------------|-----------|-----------------|--------|
| | Project Manager | Developer | Software Tester | |
| Yes | 13 | 19 | 19 | 51 |
| | 61.9% | 90.5% | 90.5% | 81.0% |
| No | 8 | 2 | 2 | 12 |
| | 38.1% | 9.5% | 9.5% | 19.0% |
| Total | 21 | 21 | 21 | 63 |
| | 100.0% | 100.0% | 100.0% | 100.0% |

Source: (Survey result and own computation, 2024)

The reason for the above significant difference is explained as follows. Ethiopian Commercial Bank has dedicated staff for its projects including software development projects. The project administration is handled by its project management office and business analysis directorate. The technical software development is conducted in Information Systems & Application Management department. There is a section for in-house software development under this department. All the project workers are salaried staff and there is no extra payment related to each project. For that reason, code developers and testers answered that there was no extra cost for delayed software projects. However, project managers mostly responded as there was a cost overrun for all delayed projects. That is the cause of the difference noticed between the different positions.

Table 4.6 Table Showing if the Project Was Successful or Not According to Survey

| | | Was Project Success? | | | |
|-------|-------------------|----------------------|---------|---------------|--------------------|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Project Failed | 9 | 14.3 | 14.3 | 14.3 |
| | Project Succeeded | 54 | 85.7 | 85.7 | 100.0 |
| | Total | 63 | 100.0 | 100.0 | |

Source: (Survey result and own computation, 2024)

In conclusion, as it was stated in the second chapter, borrowing Standish Group’s project success criteria, projects’ performances at completion are categorized in three as: Successful, failed, and challenged with the following explanation.

- Successful project: The project is completed on time and on budget with all the requirements as initially defined.
- Challenged project: The project is completed but over-budget, over the estimate, or without some initially defined functionalities (without fulfilling of the three constraints)
- Failed project: The project is canceled during the development, or the outcome of the project has never been used.

For the purpose of our study, we consider ‘successful’ or ‘challenged’ projects as success while we consider ‘failed’ projects as failure. In this regard, 85.7% CBE’s in-house developed software projects were successful while only 14.3% were failures.

4.2.2 Main factors affecting the success of software development projects and the top three among them

All the 19 respondents of the study have been asked their opinion on which of success factors were the most important. They have been provided with sixteen most significant success factors which were collected from relevant literatures in a ‘select many’ type question. The respondents were asked to choose 5 factors from the list provided. User/Client Involvement, Hard-Working & Competent Project Staff, Completed and Accurate Requirements, Collaborative Organizational Culture, Proper Planning, Clear Vision & Objectives, Experienced Project Manager, Clear Statement of Requirements, Realistic Expectations, Good Schedule, Executive Management Support, Project Ownership, Well Defined Communication, and Minimized Scope were selected by the respondents.

Table 4.7 Table Showing the Percentage of Success Factors According to Respondents

| SuccessFactors Frequencies | | | |
|--|----|---------|------------------|
| Success Factors | N | Percent | Percent of Cases |
| User/Client Involvement | 15 | 15.8% | 78.9% |
| Hard-Working and Competent Project Staff | 15 | 15.8% | 78.9% |
| Completed and accurate requirements | 13 | 13.7% | 68.4% |
| Collaborative Organizational Culture | 11 | 11.6% | 57.9% |
| Proper Planning | 8 | 8.4% | 42.1% |
| Clear Vision & Objectives | 8 | 8.4% | 42.1% |
| Experienced Project Manager | 7 | 7.4% | 36.8% |
| Clear Statement of Requirements | 6 | 6.3% | 31.6% |
| Realistic Expectations | 4 | 4.2% | 21.1% |
| Good Schedule | 3 | 3.2% | 15.8% |
| Executive Management Support | 2 | 2.1% | 10.5% |
| Project Ownership | 1 | 1.1% | 5.3% |
| Well Defined Communication | 1 | 1.1% | 5.3% |
| Minimized Scope | 1 | 1.1% | 5.3% |

| | | | |
|-------|----|--------|--------|
| Total | 95 | 100.0% | 500.0% |
|-------|----|--------|--------|

Source: (Survey result and own computation, 2025)

The first eight factors in their order cover 87.4% of all the selected factor while only the first four constitute 56.8% of all the selections.

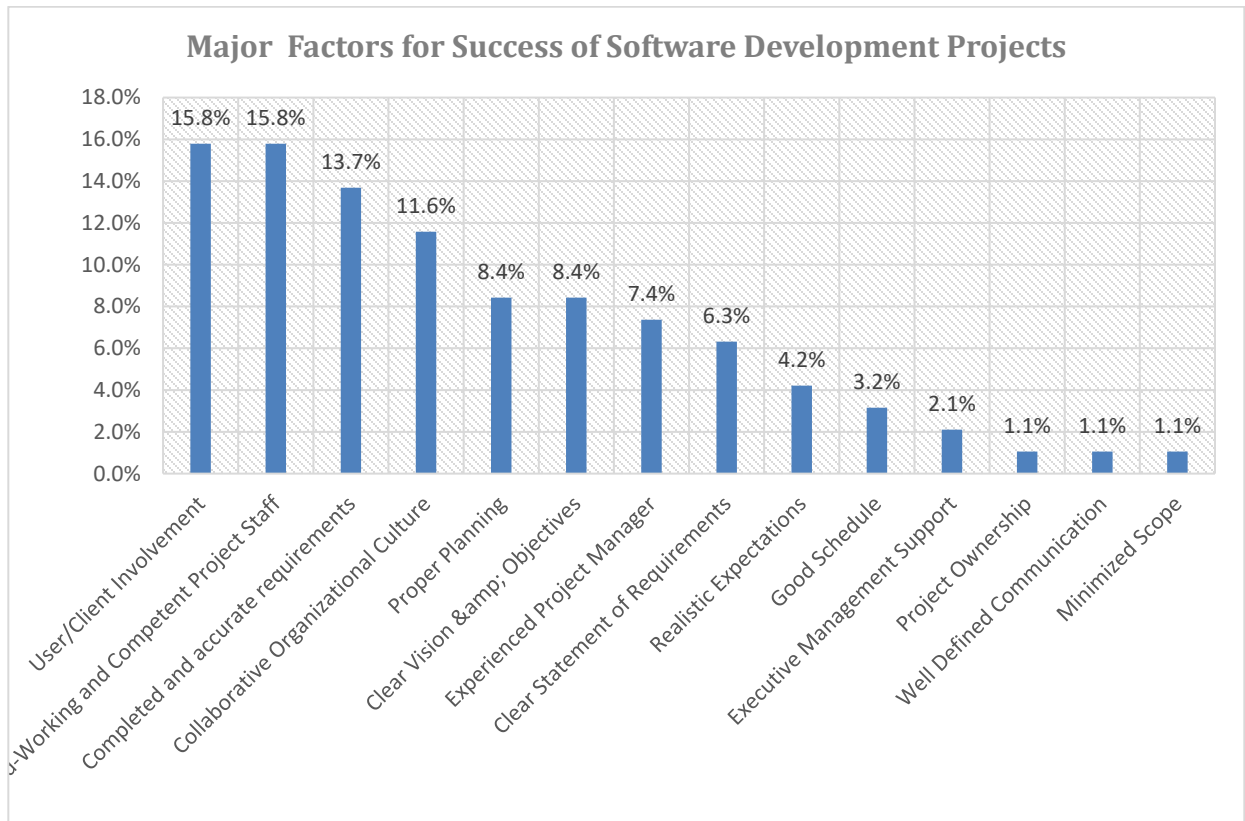


Fig. 4.1 Chart Showing Success factors in Order of Importance,

Source: (Survey result and own computation, 2024)

Considering the above table and chart, we can easily learn that the top three major success factors for software development projects were User/Client Involvement, Hard Working & Competent Project Staff, and Completed & Accurate Requirements. The three major factors only cover about 45.3% of all the selected factors.

Table 4.8 Respondents’ Perception of Success factor by Position of the Respondent

| Success Factor | Project Manager | Developer | Software Tester | Total |
|---|-----------------|-----------------|-----------------|--------------|
| User/Client Involvement | 2(10.0%) | 8(17.8%) | 5(16.7%) | 15.8% |
| Executive Management Support | 2(10.0%) | 0(0.0%) | 0(0.0%) | 2.1% |
| Clear Statement of Requirements | 1(5.0%) | 2(4.4%) | 3(10.0%) | 6.3% |
| Proper Planning | 1(5.0%) | 4(8.9%) | 3(10.0%) | 8.4% |
| Realistic Expectations | 0(0.0%) | 3(6.7%) | 1(3.3%) | 4.2% |
| Project Ownership | 1(5.0%) | 0(0.0%) | 0(0.0%) | 1.1% |
| Clear Vision & Objectives | 2(10.0%) | 3(6.7%) | 3(10.0%) | 8.4% |
| Hard-Working and Competent Proj. Staff | 4(20.0%) | 7(15.6%) | 4(13.3) | 15.8% |
| Completed and accurate requirements | 0(0.0%) | 7(15.6%) | 6(20.0%) | 13.7% |
| Well Defined Communication | 0(0.0%) | 1(2.2%) | 0(0.0%) | 1.1% |
| Good Schedule | 1(5.0%) | 1(2.2%) | 1(3.3%) | 3.2% |
| Collaborative Organizational Culture | 3(15.0%) | 5(1.1%) | 3(10.0%) | 11.6% |
| Minimized Scope | 0(0.0%) | 1(2.2%) | 0(0.0%) | 1.1% |
| Experienced Project Manager | 3(15.0%) | 3(6.7%) | 1(3.3%) | 7.4% |

Source: (Survey result and own computation, 2024)

On the other hand, considering major success factors by the position of the respondents, we get different findings. Similar top three factors are found for both developers and testers but in different orders and weights. However, the top three factors for project managers differ slightly from the other two groups. Hard-Working and Competent Project Staff (20%), Collaborative Organizational Culture (15%), and Experienced Project Manager (15%) were their selections.

CHAPTER 5: SUMMARY, CONCLUSIONS and RECOMMENDATIONS

The objective of this research, as detailed in the first chapter, is to assess the success rate of software development projects, identify the major factors for such projects and point out the top three among them. This chapter seeks to contextualize the findings presented in chapter four within the framework of the study's aims and objectives, which serve as the foundational motivation for this research.

5.1 Summary of findings

Twenty-one in-house developed software projects of Commercial Bank of Ethiopia have been covered in this study. The study was a census type and no sampling technique was employed. Those projects were considered for the study as they were the ones which were completed, or cancelled after development started within the past two years. A total of 19 respondents, three participants at different positions from each project, were interviewed. All the respondents had participation in two or more projects. The questionnaire used for the study is composed of three sections: namely respondent information, three project specific questions, and opinion of the respondent about major success factors. The interviews were conducted by the researcher face-to-face with the respondents.

Based on the findings of the study conducted on in-house developed software projects of the Commercial Bank of Ethiopia:

- 85.7% of all the studied projects can be considered successful as they were able to deliver full or partial of the requirements and were in use after completion.
- 60.3% of the projects were completed within the planned time.
- 81% of the projects were reported to be successful cost wise.
- 76.2% of the projects were able to deliver all their requirements while 9.5% delivered partially besides they were put in service.
- 14.3% of the projects were either cancelled or abandoned after completion -> failed

- User/Client Involvement, Hard-Working & Competent Project Staff, Completed and Accurate Requirements, Collaborative Organizational Culture, Proper Planning, Clear Vision & Objectives, Experienced Project Manager, Clear Statement of Requirements were the factors mostly selected by the respondents as major factors for project success.
- The top three factors User/Client Involvement, Hard-Working & Competent Project Staff, and Completed & Accurate Requirements combined covered 45.3% of the selections.

5.2 Conclusions

The success rate of software development projects studied by using the case of Commercial Bank of Ethiopia, in-house developed software, shows a very significant success of more than 80%. As mentioned in the first chapter, at least fifty percent of all projects fail (Djurovic, 2023) and (Bilir and Yafez, 2022) say that IT projects are one of the project types that have lower success rates. Putting together the facts stated in the two research papers, one can conclude that IT projects in general and software development projects in particular are expected to have significantly lower success rates. Having this in mind, we can boldly conclude that CBE's in-house developed software projects had very high success rates. This high success rate can be attributed to all the playing parties, i.e. the customer, the contractor, and the consultant being under one umbrella which is the organization CBE. In such situation the parties can work harmoniously, communications relatively go smooth among them, they can update their work plan, schedule, and even the deliverables without much disagreement. The top three factors which were selected as success-enabling factors for software development projects by this research, namely User/Client Involvement, Hard-Working & Competent Project Staff, and Completed & Accurate Requirements, support the importance of the playing-parties working closely.

5.3 Recommendations

Although the Commercial Bank of Ethiopia's in-house software development projects have a much higher success rate than those of other comparable studies, success rates can still be increased. Accordingly, the following suggestions are made in light of the research findings.

1. Based on the findings of the study, the three most relevant parties of a project, the customer, the contractor, and the consultant being under one company yields high success rate of software development projects. But that is not common in reality as only few companies develop their own software. Instead, we can draw one conclusion from this. The playing parties should work as one organization, work very closely and have smooth communications to get such high success rates in projects.
2. Involving customers or end users intensively during requirement analysis, giving sufficient time for requirement gathering, of a project and even during the execution phase greatly impacts the performance and results of a project. So, all companies should consider this.
3. Having complete & accurate requirements of a project, software development project in particular, is crucial for the success of a project. This can be done by continuous communication & closely working if there are any need of change in requirements.
4. Staffing a project with competent and hard-working people is essential in achieving goals as evidently shown in the study. Companies always should put the success of the company first. They can hire committed and hardworking people and capacitate them with continuous trainings and coaching.
5. Collaborative organizational culture should not be underestimated. In such environment people help each other and one can learn from other colleague. So, organizations should create favorable work environment where people collaborate and work together seamlessly.
6. It is obvious that having clear vision and objectives of the project and results before starting execution is very important.
7. Proper planning is one crucial step in project execution. It is better to work thoroughly on the plans before rushing to the execution for the sake of better performance and results.

5.4 Research Limitation and Areas of Further Research

5.4.1 Limitation of the study

The researcher's initial interest was to conduct a bigger study on the 'success rate of software development projects' involving as many software development companies as possible, like the researcher has seen other studies on similar topic at national level of some countries. But because of time and financial limitations, and some problems that might arise during data collection phase i.e. related to getting genuine data, it was decided to conduct a similar study limited to one company which has vast experience in developing its own software. As the findings show, the CBE's software development projects have very high success rates. However, this might not represent the case of most software development projects which involve the playing parties from different organization. It is because communications, updating work schedules and plans, updating final product's features, agreeing on extra costs because of delay and change of functionalities obviously would not be easy like the case of this study.

5.4.2 Suggestion for future research

This study was possible because of the permission and cooperativeness of the staff of Commercial Bank of Ethiopia. It would be sounder if it is possible to do a study on similar topic on software development projects involving consultants, customers, and contractors from different organizations with large scale. That can be done by a concerned governmental agency or companies which have interest and future plan in investing in similar areas.

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Annexes

Appendix I: The Questionnaire

MAPM Project Work

<https://ee.kobotoolbox.org/preview/i/8O44IgTC>

MAPM Project Work

Section 1: Background Information

Your name: _____

(Your name will not be mentioned either in the results or in the master thesis; it is only for internal use. The only reason I am collecting your name is to get back to you if a question is missed or need any additional information.)

1. Your gender?

- Male
- Female

2. Your age group?

- < =20
- 21-30
- 31-40
- 41-50
- 51-60
- 61+

3. Your academic background?

- Highschool or below
- Certificate or diploma
- Bachelor degree
- Master degree
- Doctorate degree
- Other (mention) _____

4. How long have you been working professionally with software development?

- < 2 years
- 2-4
- 5-7
- 8-10
- >10

5. How many projects have you participated in?

- 1 Project
- 2-4 Projects
- 5-7 Projects
- 8-10 Projects
- >10 Projects

6. Your current position at your current company?

- Project Manager
- Developer
- Software Tester
- Quality Manager
- Top Management
- Requirements Engineer
- Other (please specify) _____

7. For how long have you been working at your current company? (in Years)

Section 2: About Project

In this part, think of the projects that you have participated in. You need to fill this part for all the projects separately. Please make sure that the project is not under development. Also include projects that were cancelled after development has been started or never been used after completion.

Projects participated in₁

8. Project name:

9. Was the project completed on time without any delay from the estimated project completion time?

- Yes
- No

10. Was the project within the budget when it is completed?

- Yes
- No

11. Had the project been delivered with all the specifications/functionalities previously defined in the project scope?

- Yes
- No (One or more functionalities defined in scope are not delivered when the project is completed)
- The project has been canceled during the development or never been used.

Section 3: Project Success Factors

12. Mark the five most important factors for a project to be successful according to your perception - add if not mentioned under.

- | | | |
|--|---|---|
| <input type="checkbox"/> User/Client Involvement | <input type="checkbox"/> Executive Management Support | <input type="checkbox"/> Clear Statement of Requirements |
| <input type="checkbox"/> Proper Planning | <input type="checkbox"/> Realistic Expectations | <input type="checkbox"/> Smaller Project Milestones |
| <input type="checkbox"/> Project Ownership | <input type="checkbox"/> Clear Vision & Objectives | <input type="checkbox"/> Hard-Working and Competent Project Staff |
| <input type="checkbox"/> Completed and accurate requirements | <input type="checkbox"/> Well Defined Communication | <input type="checkbox"/> Good Schedule |
| <input type="checkbox"/> Skilled and Committed Project Sponsor | <input type="checkbox"/> Collaborative Organizational Culture | <input type="checkbox"/> Minimized Scope |
| <input type="checkbox"/> Experienced Project Manager | <input type="checkbox"/> Other (mention it below) | |

Add a factor if not included above.
