

**INNOVATIVE PROJECT MANAGEMENT PRACTICES ON PROJECT  
PERFORMANCE OF HEALTHCARE ORGANIZATIONS: THE CASE OF SMART  
APPLICATIONS LIMITED**

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KENYATTA UNIVERSITY**

**MAY 2024**

## DECLARATION

I declare that this research project is my original work and it has not been submitted for the award of any degree or diploma in any other institution. No part of the project should be reproduced without the authority of the author and/or Kenyatta University.

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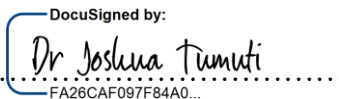
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## **DEDICATION**

I would like to dedicate this project to my family members who have always been there for me at various stages of my career. First and foremost, to my parents Mr. and Mrs. Fred Githara who have always ensured that I access all the necessary resources I needed to excel in my studies. My sincere appreciation also goes to my only brother, Simon Muracia for their encouragements that motivated me through my studies and project work.

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I am also grateful to my course mates for their support in proof reading my documents and peer reviews to ensure that my documents meet the expected levels of professional standards. Finally, I would also wish to thank my family for their moral and financial support throughout the project periods.

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## **ABBREVIATIONS AND ACRONYMS**

<b>AI</b>	Artificial Intelligence
<b>ANOVA</b>	Analysis of Variance
<b>APM</b>	Application Performance Monitoring
<b>CECAN</b>	Centre for the Evaluation of Complexity across the Nexus
<b>ERP</b>	Enterprise Resource Planning
<b>HRM</b>	Human Resource Management
<b>ICT</b>	Information Communication and Technology
<b>IoT</b>	Internet of Things
<b>IT</b>	Information Technology
<b>JTBD</b>	Jobs-to-be- Done Theory
<b>KMO</b>	Kaiser-Meyer-Olkin
<b>KRA</b>	Kenya Revenue Authority
<b>MIT</b>	Massachusetts Institute of Technology
<b>NHIF</b>	National Hospital Insurance Fund
<b>PMI</b>	Project Management Institute
<b>PMI</b>	Project Management Institute
<b>SMEs</b>	Small and Medium-sized Enterprises
<b>SMS</b>	Short Message Service
<b>USSD</b>	Unstructured Supplementary Service Data
<b>VIF</b>	Value Inflation Factor

## OPERATIONAL DEFINITION OF TERMS

**Innovative Project Management** Is the application of new ideas, emerging scientific processes, value maximization strategies and disruptive technologies such as artificial intelligence, Internet of things, enterprise resource planning and other digital tools to achieve exceptional project performance. The indicators for innovative project management will include deployment of novel ideas, as well as, use of value adding and emerging technologies to ensure continuous improvement.

**Project Performance** Project Performance is the degree to which a project achieves its objectives within the specified time, cost, scope, and quality constraints. It is a key indicator of the project's success and is measured against its goals, expectations, and objectives. The conceptual framework for project performance includes the following components:

An interconnected computer applications allowing organizations to efficiently coordinate their activities across the business units. The system comprises enterprise performance management software enabling the firms to plan, budget, predict and report on the project 's progress.

**Management Styles** Project management strategy relying more on collaborations,

coordination and continuous learning than bureaucratic procedures. Agility allows project managers to keep pace with the changes in the contemporary world.

### **Proactive Project Risk Management**

Predictive analysis of the potential causes of project failures, as well as, development of contingencies for the unseen challenges. Indicators for proactive risk management will include existence of internal control mechanisms, team coordination policies, and regular training of employees on procedures for identifying the root causes of project risks and the industry 's best prevention measures.

### **Automated Project Team Coordination**

This refers to the use machines and technology to foster seamless collaborations among various units or people involved in a project work. In this case, the indicators for automated

## ABSTRACT

Effective project management stands as a cornerstone for organizational growth, particularly in the healthcare sector where innovative practices are imperative for delivering high-quality services. Despite advancements, challenges persist, including technology project failures, inadequate research, and issues of transparency. Smart Applications Limited, a provider of ICT services, operates within this dynamic environment, facing pressures to adapt to disruptive digital technologies while ensuring project success. This study seeks to examine Smart Applications Limited's experiences in managing healthcare technology projects and the effects of innovative project implementation on the firm's financial health. The research objectives focus on investigating the impact of agile management practices, evaluating the benefits of implementing ERP systems, analysing the effectiveness of automated project team coordination techniques, and assessing the relationship between proactive risk management and project performance. Adopting a mixed-method research design, this study integrates quantitative and qualitative approaches to gain comprehensive insights into project management dynamics. The target population comprises 60 project managers within Smart Applications Limited, with data collected through questionnaires. Utilizing the census sampling technique ensures the inclusion of all managers from relevant departments. The study employs the multiple regression model to establish correlations between project management styles and performance indicators at Smart Applications Limited. By addressing these objectives, this research contributes to filling the existing gap in understanding success factors for project implementation in the healthcare sector. Through insights gained, Smart Applications Limited and similar organizations can enhance their project management strategies, fostering sustainable growth and resilience in an ever-evolving healthcare landscape.

**Keywords:** Agile Management Practices, Project Value Monitoring Tool, Automated Project Team Coordination Techniques, Proactive Risk Management

## **CHAPTER ONE: INTRODUCTION**

### **1.1 Background of the Study**

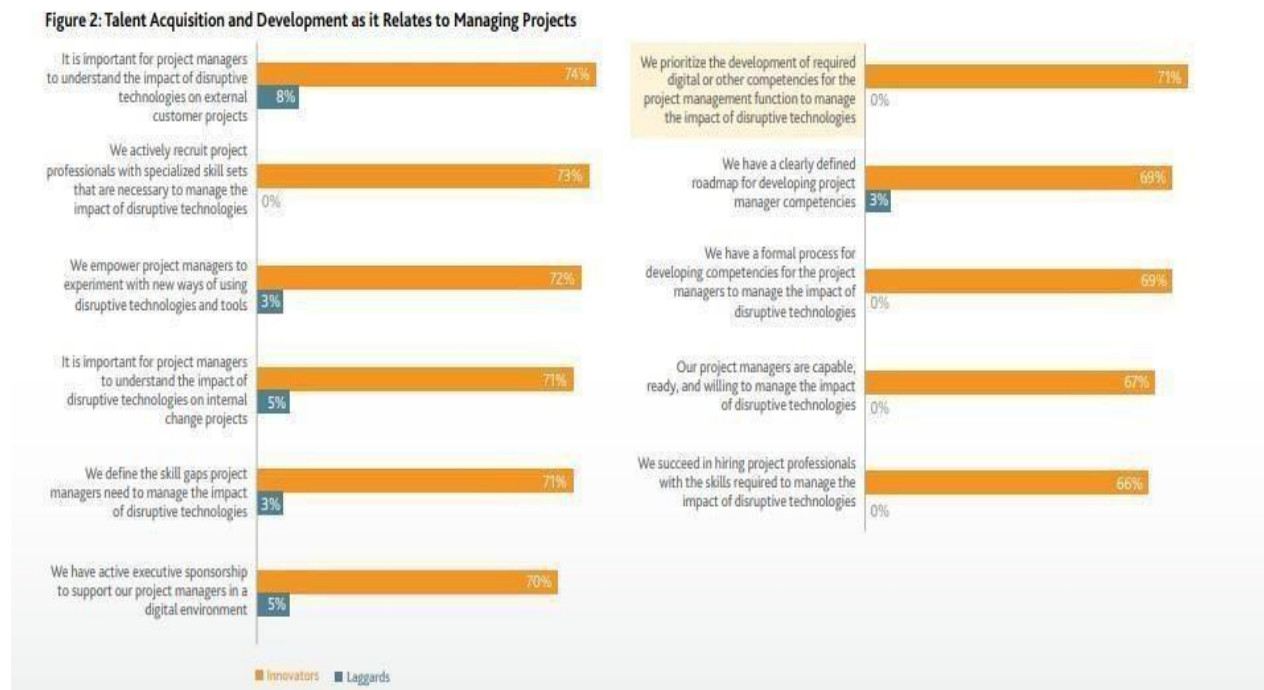
Effective project management is crucial for the sustainable growth of any organization. In the healthcare sector, innovative project management approaches have led to numerous benefits, such as increased access to medical care, improved service quality, and low medical errors. Adopting disruptive digital technologies such as automation has also freed project teams from routine tasks, allowing them to focus on more value-adding activities. However, research shows that the failure of technology projects is a universal problem affecting organizations in all sectors globally.

This problem is also prevalent in the healthcare industry, where seamless coordination and implementation of projects face significant threats. Despite adopting innovative approaches to project management, factors such as inadequate research, corruption, lack of transparency, and accountability continue to impact project outcomes. Smart App Limited provides ICT services to both government and private institutions.

As such, the company requires excellent project management strategies to increase its customer base and financial performance. Therefore, there is a need to investigate the factors impacting Smart App Limited's project success rates. Understanding these factors will improve the company's project management strategies and ultimately enhance its performance.

Globally, innovation is changing the outcomes of virtually every type of project. According to the Project Management Institute (2018) disruptive digital technologies are adding value throughout the project lifecycle. The new technologies such as automation are freeing the project team members from their routine roles hence, they now have more time to devote to more value adding

activities such as strategy formulation. As a result, more than 80% of the innovator organizations are recruiting project managers with skill sets that are needed to achieve consistent results in the midst of the digital environment (Project Management Institute, 2018). The organization surveyed 469 human resource professionals to determine the effects of innovative behavior in coping with the emerging disruptive technologies. The study results displayed in figure 1 below indicates that the vast majority of the project leaders believe that it is possible to excel in the current market without embracing the innovative approaches.



**Figure 1.1 PMI Study Results on the Need for Project Innovation**  
**Source: PMI (2018)**

Most managers are already employing the technologies to navigate the challenging market environments. More than 70% of the respondents recognize the need to acquire new project management skills. This is because businesses have a wide variety of project management tools such as cloud solutions, Internet of Things, blockchain, artificial Intelligence, robotics, 3D printing and many others. Incorporating the innovations into the project management are enabling companies to achieve better results than in the past.

To improve the background section, we need to provide more context and detail on Smart App Limited and its operations and establish a connection between the company's operations and the need for agile project management practices. Smart App Limited is a technology company specializing in developing and implementing innovative solutions in the healthcare sector. The company operates in Kenya, a country facing various challenges in the healthcare sector, including an aging population, reduced funding, and rising inflation. These challenges make it difficult for healthcare providers to achieve expected returns on investment while still delivering high-quality services to their clients.

Smart App Limited recognizes the need for innovative project management styles to remain competitive in the dynamic global healthcare market. Traditional project management practices are needed to cope with the constant shifts and changes in consumer preferences and technology. The company believes agile project management practices can help it achieve efficiency, exceptional service deliveries, and cost and time savings.

Agile project management is a methodology that emphasizes flexibility, collaboration, and adaptability in project delivery. It enables project managers to respond quickly to changing requirements and to deliver projects in shorter iterations. Agile project management practices can

also help companies reduce project failure risk by ensuring that teams remain focused on delivering value to the client.

For Smart App Limited, adopting agile project management practices is crucial for achieving sustainable growth and delivering seamless coordination of healthcare technologies. The company recognizes that implementing innovative projects through conventional project management methodologies can be challenging due to the complexities involved. Project managers are under increased pressure to deliver exceptional services with limited resources, and the costs of projects often exceed their budgets. The company also acknowledges the high failure rates of IT projects and the potential negative impact of poor risk management strategies. Smart App Limited operates in a challenging environment that requires innovative solutions and agile project management practices to remain competitive. The company recognizes the importance of adopting these practices to achieve its strategic objectives and deliver value to its clients.

In Kenya, the technologies have been applied to offer health training to healthcare providers in Dadaab Refugee Camp (Burkardt et al., 2019). Different actors including governments, community-based organizations, private sector and the civil societies often coordinate their efforts in times of crisis such as the ongoing corona virus pandemic. However, as Schonberger and Čirjevskiscites (2017), project implementation are characterized with external forces, unexpected events, conflicting demands by the stakeholders, changing constraints and fluctuating resource flows. The factors collectively affect the success of projects.

The stakeholders are, therefore, in need of better project management strategies. This project seeks to investigate the factors impacting on the success rates of Smart Applications International Limited. As a provider of ICT services to both the government and private institutions, excellence

in project management would go a long way in increasing the company's customer base and financial performance.

### **1.1.1 Innovative Project Management**

Innovative project management styles are reshaping health and related sectors in unprecedented ways. Artificial intelligence and other digital tools are enabling to foresee challenges and turn opportunities into steady revenues (Raith et al., 2017). The application of data science helps in agility in decision making. For example, the managers move quickly in capitalizing on latest leading business practices to accomplish the project strategic goals (Biazo et al., 2020). The big data analytics and videoconferencing tools are being increasingly employed to launch better Scrum project management styles. This is a framework that encourages small project teams to source for ideas from multiple stakeholders (Hidalgo, 2019). The Scrum Master works in short cycles known as sprints and the team meet regularly to evaluate progress and improve performance.

Alternatively, firms can employ enterprise resource planning (ERP) system are enabling the health organizations to integrate planning, inventory management, sales, marketing and finance functions (Biazo et al., 2020). The innovations are compatible with waterfall project management methodologies which deliver the periodic goals in sequential phases.

As Thesing et al. (2021) found, the success of the framework increases whenever research is conducted upfront and estimations of the resources needed are accurate. The data driven decisions foster innovative mindset, seamless coordination in managing the projects and ability to surpass clients' expectations. Consequently, the identified independent variables for the study will include agile project management styles, proactive risk management, and automation of project cycles and effective deployment of ERP systems to achieve desired goals.

### **1.1.2 Project Performance**

Projects are regarded a success whenever every step of implementation is executed with high level of professionalism (Njeru & Luketero, 2015). In healthcare sector, this occurs whenever there is definition of objectives, comprehensive measures for ensuring that costs, time and quality meet or exceed the desired standards. Outcomes such as innovations, user friendliness, cost leadership, and high customers 'satisfaction levels often show the performance levels (Vrchota et al., 2021).

In other words, success means different things to different stakeholders. From the shareholders 'perspective success of a project is determined by the returns in investment, reduced costs, profitability, growth in market share or number of customers and many other financial gains. In contrast, consumers view project success in terms of sustainable solutions to a market challenge, efficiency and reliability in accessing services, decrease in prices and many others (Chou & Pramudawardhani, 2015). Given that Smart Applications Ltd serves stakeholders with diverse needs, the project success in this case will be defined by the performance standards. Any healthcare system that achieves or surpasses the targeted value creation and financial goals will be regarded as a success. Model proposed by Santos et al. (2020) will be adopted to help in the measure of success. The framework comprises four dimensions namely, project efficiency, impact on customers, direct business benefits and implications on future growth. Project efficiency dimension further entails completion time and resources incurred.

### **1.1.3 About Smart Applications Limited**

Smart Applications is an international healthcare solutions provider headquartered in Nairobi. The company was founded in 2011 to deliver a range of world class technological solutions across East African nations and beyond. It offers a number of services to the clients which includes mobile phone applications, healthcare software, automated medical scheme management solution,

biometric identity management solution, Smart time and attendance solutions (Smart Applications, 2022). However, its most popular service includes the USSD & SMS app which allow the users to check their medical/insurance card balances using their mobile phones by dialing \*891#. The company is headquartered at International Life House but operates via Omni-channel platforms hence targets both the local and international customers. That is, besides the physical offices, the company serve its clients via the website, and all the social media platforms. However, this study concentrates on the firm 's strategies and procedures for increasing the success rates of Smart App Limited 's ongoing and future projects particularly the development of new digital healthcare technologies. Insurance companies and hospitals.

#### **1.1.4 Narrative Description**

Smart Applications Limited is a leading ICT solutions provider that offers a wide range of world-class technological solutions, including biometric solutions, automated medical scheme management solutions, time and attendance solutions, canteen management solutions, and identity management solutions. The company is fondly known as "Smart" within the industry and was founded to provide innovative, secure, high-tech solutions in Africa and beyond.

The selection of Smart Applications Limited for this study is justified by the company's reputation as a leading provider of ICT solutions, particularly in biometric solutions. Biometric solutions are becoming increasingly important in various industries, including healthcare and finance, where security and identity management are critical. Smart Applications Limited has demonstrated its ability to deliver innovative and secure biometric solutions that meet the needs of its clients.

Furthermore, the company's commitment to constant research and innovation aligns with this study's objectives, which aim to explore the correlation between adopting innovative project management practices and project performance. Smart Applications Limited's experience

delivering high-tech solutions in complex business environments such as health insurance technologies makes it a suitable candidate for this study.

Overall, the selection of Smart Applications Limited is justified by the company's reputation, experience, and expertise in delivering world-class ICT solutions, particularly in biometric solutions, as well as its commitment to constant research and innovation.

## **1.2 Statement of the Problem**

The global health market is constantly changing and demanding innovative project management styles. Cloud solutions, AI, IoT, and other digital tools are displacing traditional project management processes. Entrepreneurship and changing consumer preferences also call for agility in responding to market changes. However, traditional project management practices pose significant threats to firms operating in highly competitive sectors such as healthcare.

Project managers need more resources to deliver exceptional services. Studies show that many IT projects fail, recording cost and schedule overruns. There is a research gap on the success factors for project implementation, and the existing studies' performance statistics need to be clarified for decision-makers.

The project managers need new knowledge of proactive risk management strategies to achieve sustainable growth. The innovative approaches for coping with the changes in the micro and macro-environment lead to high performance. However, there is a lack of knowledge on how innovative project implementation procedures affect the financial health of firms.

This study aims to explore Smart Applications Limited's experiences in managing the threats to the seamless coordination of healthcare technologies and the effects of innovative project

implementation procedures on the firm's financial health, filling the research gap on the success factors for project implementation in the healthcare sector.

### **1.3 Objectives of the Study**

#### **1.3.1 General Objective**

To determine the impacts of innovating project management practices on the project performance of Smart Applications Limited.

#### **1.3.2 Specific Objectives**

- i. To investigate the effect of agile management practices on project performance of Smart Applications Limited.
- ii. To evaluate the effect of project value monitoring tools on project performance of Smart Applications Limited.
- iii. To assess the effect of automated project team coordination techniques on project performance of Smart Applications Limited.
- iv. To investigate the effect of proactive project risk management on project performance of Smart Applications Limited.

## **1.4 Research Questions**

- i. What is the effect of agile management practices on project performance of Smart Applications Limited?
- ii. What is the effect of project value monitoring tools on project performance of Smart Applications Limited?
- iii. What is the effect of automated project team coordination techniques on project performance of Smart Applications Limited?
- iv. What is the effect of proactive project risk management on project performance of Smart Applications Limited?

## **1.5 Significance of the Study**

Although the study focuses on Smart Applications Limited, the outcomes is relevant to the entire industry. The project managers from other sectors of the economy gain valuable insights into the changes needed to maximize values for their stakeholders through well- coordinated projects. The consumers of healthcare projects learn about their roles in improving the outcomes of ongoing projects.

The government and policy makers gain new data for supporting the upcoming healthcare service providers in achieving the goals of their projects. The healthcare department benefit from the findings relating on the strategies for overcoming the barriers to employing the innovative management practices in achieving sustainable growth. The data-driven insights will be valuable in improving the sector ‘s entire entrepreneurial ecosystem.

Moreover, this study l identifies areas related to project management and performance field that

require more research. As a result, the knowledge gap will assist other researchers in choosing appropriate topics for future studies. The study is also one of the few studies exploring the correlation between disruptive technologies and project performance in Kenya 's healthcare sector hence it will add new knowledge in the field.

### **1.6 Scope of the Study**

Smart Applications Limited offer many technology solutions to clients. However, this study concentrates on the influence of the disruptive technology on the firm 's critical success factors such as short and long-term objective formulation of key projects, resources management, control, communication, evaluation and customer relationship management. The data was obtained through questionnaires that was answered by the employees at the firm 's head office and major clients from Nairobi and its environs.

### **1.7 Limitations of the Study**

This research project targeted both the internal and external stakeholders of Smart Applications Limited, availability of all the targeted respondents was a limitation due to their busy schedules. In addition, fear of leaking business secrets by the senior level management hindered the transparency of the data collection process. However, the participants received prior notification of the interview via both mails and text messages. The consent letter assured the respondents their confidentiality and the benefits of the information gathered in improving the value created by the company for its stakeholders.

## **1.8 Organization of the Study**

This research project comprises of five chapters. The first section presents background information on innovative project management practices, statement of problem, as well as, the objectives, and value of the study to various stakeholders. Chapter two cover the theoretical and conceptual frameworks and empirical data in relation to the impacts of the innovation on project performance in the healthcare sector. While chapter three discusses the study methodologies particularly the sampling techniques to be used, data collection instruments and tools to be employed in the analysis and interpretation of the final results.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

This chapter reviews existing literature on the relationship between innovative management styles and outcomes of the project. The first section presents theoretical framework that will guide the data analysis and interpretation. The chapter further reviews empirical evidence gathered by different researchers under different contexts linking project innovation and increased productivity, cost savings, value maximization and other positive returns. The third part develops the conceptual framework showing the relationship between the dependent and independent variables while the last section presents the research gap.

### **2.2 Theoretical Framework**

This research project adapts Jobs-to-be-done and system thinking theories based on their relevance to the study 's objectives.

#### **2.2.1 Jobs-to-be- Done Theory (JTBD)**

Effective project management is a critical factor for the sustainable growth of any organization, especially in highly competitive sectors such as healthcare. In recent years, disruptive digital technologies such as automation, cloud solutions, AI, IoT, and other digital tools have revolutionized project management approaches, leading to numerous benefits, such as increased access to medical care, improved service quality, and low medical errors. However, research shows that the failure of technology projects is a universal problem affecting organizations in all sectors globally.

In the healthcare industry, seamless coordination and implementation of projects face significant threats, including preliminary research, corruption, lack of transparency, and accountability.

Despite adopting innovative approaches to project management, these factors continue to impact project outcomes. The global health market is constantly changing and demanding innovative project management styles. Entrepreneurship and changing consumer preferences also call for agility in responding to market changes.

Traditional project management practices pose significant threats to firms operating in highly competitive sectors such as healthcare. Studies show that many IT projects fail, recording cost and schedule overruns. There is a research gap on the success factors for project implementation, and the existing studies' performance statistics need to be clarified for decisionmakers.

Project managers need knowledge of proactive risk management strategies to achieve sustainable growth. The innovative approaches for coping with the changes in the micro and macro-environment lead to high performance. However, there is a lack of knowledge on how innovative project implementation procedures affect the financial health of firms. Therefore, there is a need to investigate the factors impacting project success rates in the healthcare sector.

Smart Applications Limited is a leading ICT solutions provider delivering a wide range of world-class technology solutions in Africa and beyond. The company provides ICT services to government and private healthcare institutions, where effective project management strategies are crucial for increasing customer base and financial performance. Therefore, understanding the factors impacting Smart App Limited's project success rates will improve the company's project management strategies and performance.

This study fills the research gap on the success factors for project implementation in the healthcare sector. It explores Smart Applications Limited's experiences managing the threats to the seamless coordination of healthcare technologies and the effects of innovative project implementation

procedures on the firm's financial health. By filling this research gap, this study provides new insights into proactive risk management strategies for achieving sustainable growth in the healthcare industry.

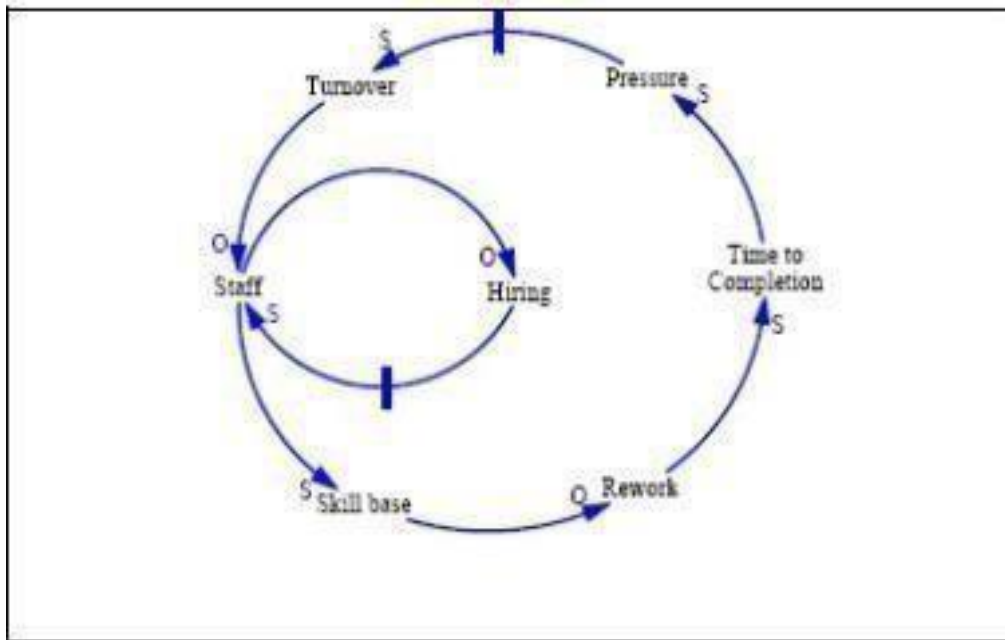
### **2.2.2 System Thinking Theory**

This is a holistic approach focusing on how various components of a project interrelate, work and function to generate targeted outputs. The origin of the concept is traceable to the 1956 discovery by Professor Jay Forrester of the MIT Sloan School of Management (Hargreaves and Podems, 2012). Forrester demonstrated that computer simulations, graphs and diagrams can be leveraged to predict system behaviours in response to the fluctuations in various components. For example, the organizations are prone to competing demands from diverse consumer bases. Various units within the, firms therefore, often employ multiple tools to perform key functions such as scenario planning, value chain analysis and process engineering (Loosemore and Cheung, 2015).

However, studies have found that the tools hardly accomplish objectives since they are not holistic. Consequently, system thinking was introduced to enable continuous discovery and diagnosis of the threats to seamless coordination among the sub components. As Sankara et al. (2010) cite, project management has a longstanding relationship with systems approaches particularly the system engineering since mid1990s. The project-based working became more technologically advanced allowing the scientists and engineers to reach new heights in full filling their stakeholders 'needs. The causal loops and systems archetypes such as levels of thinking may foster adoption of mental models that supports use of agile management practices to increase the returns on investments from projects. In this case, the cause-effect relationship would be presented by the correlation between the innovative project management styles and the final output.

Other advantages of the model include systematic approach for transforming the possible

challenges into competitive advantage (Loosemore and Cheung, 2015). This is because the model explores the connections between each input and the functioning of the entire system. As figure 2.1 below illustrates, the ineffective management of sub system such as human resources can result in serious challenges.



**Figure 2.1 System Thinking Approach to HRM**

**Source: Sankara et al. (2010)**

For example, the project leader may pressurize the staff to work for extra hours whenever the scheduled project completion time is coming to an end. The stress of overtime can in turn lead to burnout, as well as, resignation of a number of team members. The staff turnover further erodes the skill base which may lead to increased demands for rework (Sankara et al., 2010). Similar obstacles can be experienced whenever there are no techniques for monitoring the consumption of material and financial resources at different stages of the project. Consequently, use of technologies such as ERP and automated project team coordination tools can be employed to monitor the periodic performances of the projects in relation to the resource demands and performance metrics.

However, system thinking theory has few drawbacks. First, the approach is more effective in managing small projects like those that are currently being handled by Smart Applications. Limited but may not accurately reflect on the firm 's demand while handling complex projects (Nguyen et al., 2012). Secondly, systems thinking works best when the project team studies the causal relationship between the various variables over a long period of time. This means that the model is not preferable in solving crisis.

## **2.3 Empirical Literature Review**

Existing studies presents strong evidence on the positive correlation between innovation and project performance as discussed below.

### **2.3.1 Agile Project Management Practices and Cost Savings**

Agility is a popular management concept leveraged by decision makers to navigate through the challenging business times. According to Bergmann and Karwowski (2018), agile methodology is a project management technique comprising constant collaboration among stakeholders and

continuous improvement at every stage. It comprises five essential attributes of agile processes includes flexibility, transparency, creativity, effective leadership, and continuous improvement. Bergmann and Karwowski (2018) conducted a systematic literature review on the relationship between agile project management (APM) and project success.

According to the research, the development of APM is still in early stages. However, the speculations are high that it will become the project management style of the 21st century. Consequently, there are need for more evidence on the positive impacts of APM on project performance. Similarly, Dybå et al. (2014) describes agile project management as a strategy relying more on informal collaborations, coordination and learning than upfront plans.

Ideally, agility eliminates the bureaucratic procedures that consume resources but do not necessarily add value to the project. Chapter 11 of a book by Dybå et al. (2014) titled Agile Project Management discusses APM as software development approach for improving the performance of software projects. The book presents case study of the benefits of the APM over the traditional project management approaches. The benefits include autonomous teams, redundancy, feedback and learning. For example, APM entails short cycles of iterative and incremental delivery of product features. In healthcare sector, the facilitators can organize meetings to enable the team members to brainstorm over the best solutions to overcoming obstacles.

In Hidalgo 's (2019) view, the fundamental idea behind APM is to create incremental value per project phase that is completed. Various agile project management styles such as Kanban, Crum, SAFe have been found to maximize returns but at lower costs. Hidalgo (2019) conducted a case study on the advantages of adapting scrum framework for agile project management in science at UK-Based Centre for the Evaluation of Complexity across the Nexus (CECAN). It was found that

the framework is expanding from software development projects to other types of firms. The scrum approach fosters interdisciplinary collaboration thereby improving the quality of the final product. For example, the technology users relied on APM to visualize the workflows hence consistently met the project targets. However, the study did not explicitly cover how scrum and related APM innovations can be applied to the management of health projects.

Masood and Farooq (2017) which explored the advantages of agile project management (APT) over traditional approach found that the technique was ideal for ensuring financial stability in the midst of unstable environment. The systematic literature review found that the proactive actions save a firm from spending resources on initiatives that do not generate value. Changes in requirements are discovered in good time leading to low chances of wasted work. The project was also planned and executed in short cycles hence there is few instances of rework. However, Masood and Farooq (2017) used secondary data, therefore, did not present new information on how to deal with the challenges arising from adoption of APM.

Leido (2014) also showed that the opportunities to incorporate emerging trends such as digital technologies lead to low operational costs. The author published a book focusing on value and wastes in project management. The book presents multiple examples, illustrative graphics and interesting case studies on APM. However, Leido's (2014) book was published over 8 years ago hence does not cover the recent discoveries on agile project management styles. On the other hand, Leido's (2014) main arguments are in line with the findings of a study by Azanha et al. (2017) that explored the effectiveness of APT on the high-tech pharmaceutical companies in

Brazil. The researchers used exploratory qualitative research to determine the advantages of Scrum framework over the traditional means for undertaking ICT projects in the Brazilian pharmaceutical

industry. Azanha et al. (2017) found that the APT tool led to 75% and 30% reduction in the new product development time and costs respectively as compared to the traditional method. On the other hand, the study concentrated mostly on the Scrum agile framework hence does not provide valuable information on all the aspects of APM. However, several other researchers have demonstrated that APT are cheaper per unit of value delivered since the project managers enjoy higher level of effectiveness and can eliminate the non-value adding initiatives (Bergmann and Karwowski, 2018; Hidalgo, 2019).

### **2.3.2 ERP Systems and Positive Periodic Performance Results**

An ERP system is an interconnected computer applications allowing organizations to efficiently coordinate their activities across the business units (Syreyshchikova et al., 2020). The system comprises enterprise performance management software enabling the firms to plan, budget, predict and report on the project 's progress. It sources data from multiple business units such as accounting and finance, marketing, information technology, operations, purchasing inventory and production departments thereby allowing for informed decision making. Ma'arif and Satar (2018) argue that ERP system plays critical in the successful running of projects because it integrate all the processes needed to accomplish the targeted performance goals into a single system. The technology maximizes return by supporting optimization of fixed supply of resources. The project managers are able to visualize complexities and proactively manage the risks that may lead to low quality products.

Ma'arif and Satar (2018) article focused on the ERP training models used in the Malaysian industry to improve the project management skills among various groups of employees. The article compared various ERP training models hence provides evidence-based practices for producing competitive employees. However, Malaysian project management environment is significantly

different from those experienced by the Kenyan employees hence there is need for more research on the unique factors facing the country in employing the technologies to improve the project outcome.

Studies indicate that application of ERP in project management leads to superior results as compared to traditional practices. Weli (2021) found that the applications support focused thinking among all project team members since they have real time updates on the progress of the business operations. Weli (2021) investigated the validity and reliability of the provision of ERP systems via cloud computing using the end-user computing satisfaction model. The researcher collected data through snowball sampling of cloud-based ERP users.

Weli (2021) found that the managers are also alerted on the significant variances between the planned resource consumption and actual raw materials consumed hence taking necessary action to reduce wastages. Ma'arif and Satar (2018) also argue that ERP creates audit trails that supports compliance with both internal and external regulations. For example, the technology can indicate the effect of the project implementation on a firm 's carbon footprint. As a result, the managers can install new efficient processes to minimize pollution. However, the study by Weli (2021) does not comprehensively discuss the impacts of the findings on the management of the projects in the healthcare sector.

Abdel-Haq et al. (2018) also studied the effects of ERP on the outcomes of project management among small and medium enterprises in the Kingdom of Saudi Arabia. The research employed a comprehensive literature survey focusing on the successes of ERP use in KSA, the diffusion of the technology in the country and impacts on organizational performance. It was found that the technology improved performance control, cost control and productivity. The respondents

revealed that ERP ensures rigorous activity control due to the easy and ready access to instantaneous information (Abdel-Haq et al., 2018). The reporting and analysis tools particularly support diagnosis of problems such as stock outage and quality deterioration. Consequently, the ERP users record reduced cases of errors and increased speed in completing the projects. An earlier study by Deshmukh et al. (2015) that focused on ERP impacts on the quality of project outputs in 95 Indian SMEs also reached the same conclusion. That is, the Indian ERP leveraging ERP to manage their projects always produce high quality products hence are better positioned to excel in the current knowledge-based economy than their competitors.

Deshmukh et al. (2015) conducted factor analysis to ensure that each of quality aspect of the ERP was analyzed using the regression models. The analysis provided insight about the importance about the factors affecting the operations of ERP systems and how to prioritise them in order to achieve maximum quality benefits. However, as much as the study by Deshmukh et al. (2015) focused on SMEs, the findings may not be easily generalizable to the firms operating in the health sector such as Smart Applications Limited. Razzaq and Mohammed (2020) in their studies on the effect of cloud computing on Malaysian firms 'performance also found that the technologies are disrupting value creation. This was a survey on the benefits, challenges and opportunities arising from the cloud ERP systems to the Malaysian SMEs. It was found that Cloud ERP require low implementation costs but allow the users to enjoy multiple benefits such as reduced project implementation time and high returns on investment. However, the findings are not specific to the challenges facing healthcare solution providers like Smart Applications Ltd.

Alomari et al. (2018) also used survey questionnaires to examine the benefits of ERP on 972 randomly selected Malaysian manufacturing firms. The research indicated that ERP results in operational gains in terms of innovation, capacity building and technical competencies. The study

explored ERP as a critical resource in enhancing capability to improve business operations. The findings showed that ERP users are better positioned to gain and maintain competitive advantage. However, the study has research gaps on how best upcoming healthcare solutions providers can incorporate the findings into their project management practices. Overall, the empirical evidence presented show that Smart Applications Ltd. is also likely to achieve greater performances by systematically employing the emerging ERP practices.

### **2.3.3 Automated Project Team Coordination and Quality of Project Outcomes**

Automation involves the use of machines and technology to complete the project tasks and processes. Healthcare Organizations are increasingly using software tools that do not necessarily require human intervention. According to Hofmann et al. (2020), these include customized ERP systems that can monitor resource loads and notify the managers whenever the team members are overloaded. Automation plays leading roles in eliminating time-consuming, repetitive and administrative works. Hofmann et al. (2020) conducted a literature review and tool analysis on the robotic process automation and their impacts on management practices. The study found that the software automates processes that originally required several hours of human labor to perform. However, the study discussed the general benefits of automation on business and not specifically on project management.

Another study by Liu et al. (2016) found that automation enable project managers to perform complex tasks that may not be possible to achieve through human labour. The research concentrated on the real-time monitoring of large-scale construction project. The automation process provides the users with an integrated platform for improving the quality control throughout the project 's lifecycle. As a result, high-tech firms such as Caterpillar have developed telepresence tool using Internet of Things known as Live share that enables the project team members to

collaborate with the members in diagnosing problems and sharing ideas (Liu et al., 2016). The service technicians can simply send photos for analysis via smartphone and have the experts advise them accordingly on the best alternative course of action. Automation eliminates the adverse impacts of the human error on the final products. However, such automation technologies are new to the market hence more market survey are needed to improve their outcomes particularly in the healthcare sector.

McIntosh et al. (2016) also found that the automated inspections of codes in the software engineering projects often improve the quality of the end products. The study the relationship between modern code review practices and long-term software quality. McIntosh et al. (2016) demonstrated that automation leads to standardization of processes and reduced wastages. Kumar and Mishra (2016) found that 60% of the project costs are incurred in quality testing hence automated processes aimed at enhancing quality affect the outcome of the entire process. The researchers conducted experiments on the effects of test automation on the cost, quality and time involved in the software development projects. The results showed that automation leads to low project management costs, negligible cases of time overruns and high-quality end products. However, Kumar and Mishra (2016) do not explicitly discuss how firms such as Smart Applications can automate their software development project. On the other hand, there is sufficient pieces of evidence that automation will enable the firm to maximize returns.

### **2.3.4 Proactive Risk Management and Overall Performance**

This involves the identification of the potential threats to accomplishing project goals and implementing measures for alleviating the risks (Sun et al., 2019). Good examples are vulnerability tests and remediation. Article by Sun et al. (2019) extracted proactive indicators from existing literature based on their characteristics of sixteen SMEs operating in China 's chemical enterprises.

Therefore, the results demonstrate the benefits of proactive risk management but does not directly touch on the relevance of the study outcomes on healthcare projects. On the other hand, the project managers create various scenarios and test the outcomes so as to gain insights on the chances of success. In Smith and Merrit 's (2020) view, proactive risk management involves predictive analysis of the root causes of project failures, as well as, development of contingencies for the unseen challenges. Smith and Merrit (2020) published a book on unique approaches that provides a model proactive risk management that is scalable to any size project. The book offers methods for identifying causes of risks such as inadequate planning, team work dysfunctions and conflicts among management staff. As a result, Smith and

Merrit 's (2020) insights enable the project managers to build deep understanding of the effects of the potential risk on the business performance. However, the book lacks specific details on the unique environmental factors affecting Smart Applications Limited such as access to highly skilled risk managers. Guo et al. (2014) found that incorporating the proactive risk management in the complex construction projects results in shared situational awareness. The study outcome was based on a desktop review and interviews of Yi-Wan Railway Construction Project in China and Northern Gateway Toll Road project in New Zealand. A comparative analysis of the governance structures in regards to risk management showed that being proactive enhanced the ability to achieve targeted goals. However, these were infrastructural projects while Smart Applications Ltd

specializes on software solutions to various challenges facing healthcare consumers and providers.

Dandage et al. (2018) also used survey feedback from project professionals to determine the correlation of risk management and project success. The paper concentrated on the various risk categories and barriers to risk management in the domestic and international projects by combining the findings of literature survey and views of multiple project management professionals. The study indicated that the comprehensive plans for foreseeing barriers such as workers' attitude, changes in consumers' tastes and conflicts among the team members translates into excellent performance. Dandage et al. (2018) further found that while the small projects have 70% chance of succeeding, the large ones hardly overcome the quadruple constraints such as scope, time, cost and quality. The study suggest that organizations should prioritize management support, formal training and comprehensive multi-cultural policies.

However, more research is needed on how Smart Applications addresses such proactive risk management aspects and their impacts on their overall outcome on project success. Moreover, Willumsen et al. (2019) conducted a systematic literature review on the benefits of risk management on value creation particularly in the complex and ambiguous business environments. It was found that stakeholders perceive project risk management as a key element in value creation. The deeper the understanding of the risks, the higher the value created. However, the study by Willumsen et al. (2019) employed existing studies conducted in macro- environmental settings that are significantly different from that of the Kenyan healthcare sector hence more studies are needed to determine which proactive risk management styles best suit Smart Applications Ltd.

## 2.4 Conceptual Framework

### Independent Variables

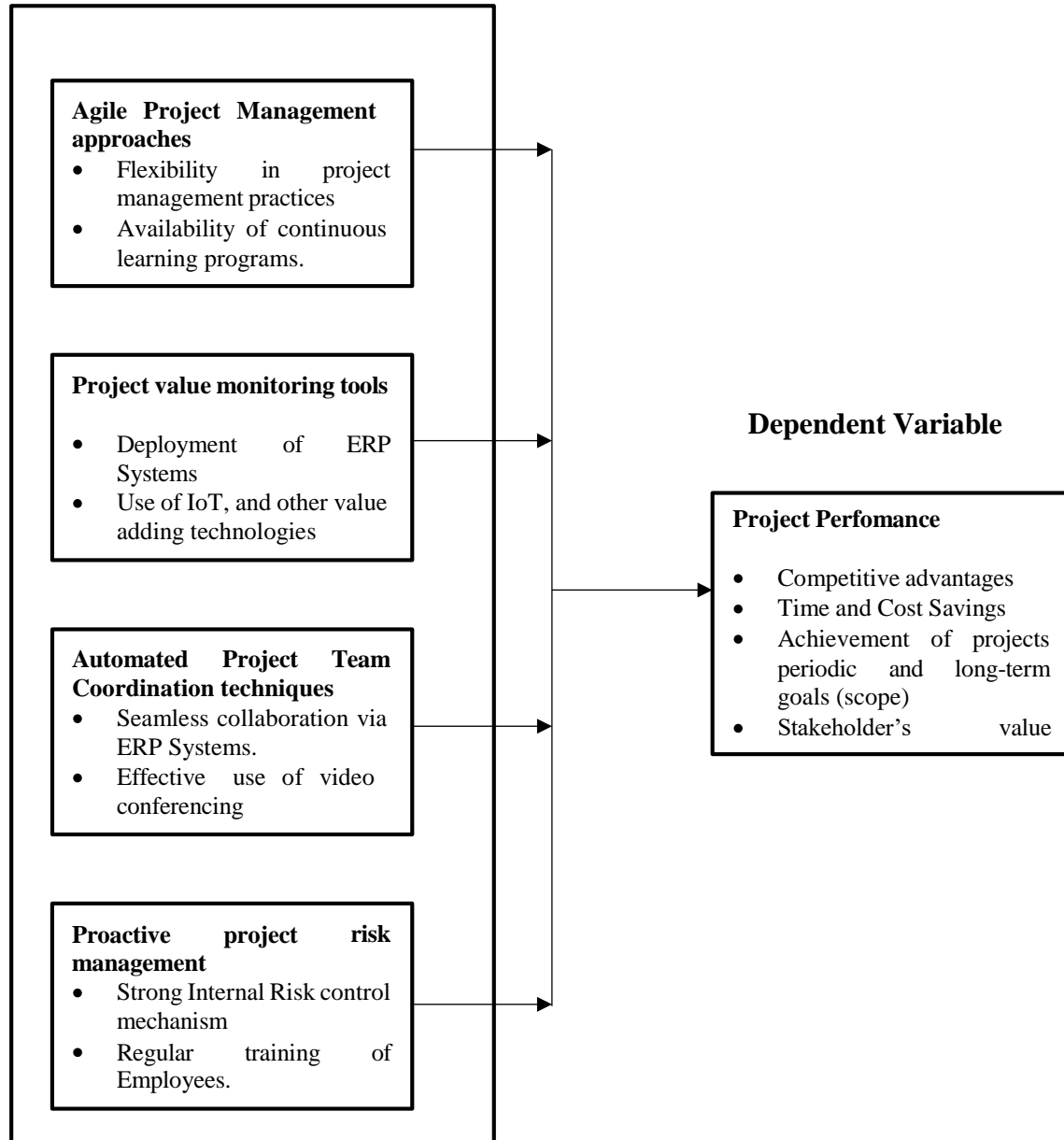


Figure 2.2 Conceptual Framework

Source: Author (2023)

## 2.5 Summary of Findings and Research Gap

Summary of the findings and knowledge gaps are as indicated in table 1 below.

**Table 2.1 Summary of Findings and Research Gap**

<b>Author</b>	<b>Topic</b>	<b>Findings</b>	<b>Research Gap</b>	<b>How the study will address the gap</b>
<b>Bergmann &amp; Karwowski (2018)</b>	Agile Project Management Practices and Cost Savings	Agile methodology emphasizes flexibility, transparency, creativity, effective leadership, and continuous improvement.	Need for more evidence on positive impacts of APM	Investigating the impact of agile management practices on Smart Applications Limited's projects' cost, time, and scope will provide empirical data on the positive impacts of APM on project performance.
<b>Dybå et al. (2014)</b>	Agile Project Management Practices and Cost Savings	Agile project management relies on informal collaborations, coordination, and learning, leading to reduced bureaucratic procedures.	Lack of coverage on how APM innovations can be applied to health projects	Analysing the effectiveness of automated project team coordination techniques in improving the quality of project outcomes at Smart Applications Limited, compared to its competitors, will explore the application of agile principles in the healthcare sector.

<b>Hidalgo (2019)</b>	Agile Project Management Practices and Cost Savings	Various agile project management styles maximize returns at lower costs.	Lack of explicit coverage on healthcare sector application	Assessing the relationship between proactive risk management techniques and Smart Applications Limited's project performance will provide insights into the effectiveness of agile methods in healthcare projects, addressing the gap in sector-specific application.
<b>Masood &amp; Farooq (2017)</b>	Agile Project Management Practices and Cost Savings	Agile project management is ideal for ensuring financial stability and reducing instances of rework.	Limited focus on addressing challenges arising from APM adoption	Investigating the impact of agile management practices on Smart Applications Limited's projects' cost, time, and scope will delve into the challenges and benefits of APM adoption, offering insights for addressing implementation hurdles.

<p><b>Leido (2014)</b></p>	<p>Agile Project Management Practices and Cost Savings</p>	<p>Agile project management opportunities lead to low operational costs.</p>	<p>Lack of recent discoveries on APM styles</p>	<p>Investigating the impact of agile management practices on Smart Applications Limited's projects' cost, time, and scope will provide updated insights into the application of APM in the current business environment, addressing the gap in recent discoveries.</p>
<p><b>Azanha et al. (2017)</b></p>	<p>Agile Project Management Practices and Cost Savings</p>	<p>Scrum framework leads to significant reductions in new product development time and costs.</p>	<p>Focus on specific agile framework, limited coverage on APM</p>	<p>Analyzing the effectiveness of automated project team coordination techniques in improving the quality of project outcomes at Smart Applications Limited, compared to its competitors, will explore broader application of APM beyond specific frameworks, addressing the gap in coverage of APM.</p>

<p><b>Weli (2021)</b></p>	<p>ERP Systems and Positive Periodic Performance Results</p>	<p>ERP applications support focused thinking and provide real-time updates on progress.</p>	<p>Limited discussion on healthcare sector application</p>	<p>Evaluating the benefits of implementing ERP systems on the efficiency, accuracy, and convenience of Smart Applications Limited in achieving its periodic performance targets will explore the relevance and benefits of ERP systems in healthcare project management.</p>
<p><b>Abdel-Haq et al. (2018)</b></p>	<p>ERP Systems and Positive Periodic Performance Results</p>	<p>ERP improves performance control, cost control, and productivity in SMEs.</p>	<p>Lack of focus on healthcare sector application</p>	<p>Evaluating the benefits of implementing ERP systems on the efficiency, accuracy, and convenience of Smart Applications Limited in achieving its periodic performance targets will explore the potential benefits of ERP systems in healthcare project management, addressing the gap in sector-specific application.</p>

<p><b>McIntosh et al. (2016)</b></p>	<p>Automated Project Team Coordination and Quality of Project Outcomes</p>	<p>Automated inspections in software engineering projects improve product quality.</p>	<p>Limited focus on software engineering projects</p>	<p>Analyzing the effectiveness of automated project team coordination techniques in improving the quality of project outcomes at Smart Applications Limited, compared to its competitors, will explore the application of automated processes beyond software engineering, addressing the gap in coverage of automation.</p>
<p><b>Dandage et al. (2018)</b></p>	<p>Proactive Risk Management and Overall Performance</p>	<p>Proactive risk management leads to excellent performance through foreseeing barriers and developing comprehensive plans.</p>	<p>Lack of focus on healthcare sector application</p>	<p>Assessing the relationship between proactive risk management techniques and Smart Applications Limited's project performance will explore the applicability and benefits of proactive risk management in healthcare projects, addressing the gap in sector-specific application.</p>

<b>Willumsen et al. (2019)</b>	Proactive Risk Management and Overall Performance	Stakeholders perceive project risk management as a key element in value creation.	Limited focus on sector-specific risk management styles	Assessing the relationship between proactive risk management techniques and Smart Applications Limited's project performance will explore the applicability and benefits of proactive risk management in healthcare projects, addressing the gap in coverage of sector-specific risk management styles.
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**Source: Author (2023)**

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter outlines the methods to be used in collecting, and analysing data throughout this study. It covers key aspects of the study methodology such as research philosophy, design, target population, sampling strategy, data collection and analysis method, and ethical considerations.

### **3.2 Research Philosophy**

Positivism philosophy is the ideal for exploring the correlation between innovative management styles and project outcomes (Comte, 2015). The paradigm embraces objectivists 'point of view that peoples 'knowledge of a phenomena expands with increased access to new experiences, observations and empirical evidence, which in turn, create new shared meanings.

According to positivism, factual knowledge collected by the researcher through observation, measurement or experimentation is always more trustworthy than the general assumptions and beliefs in an idea (Caldwell, 2015). For example, it is believed that innovative management styles lead to high project performance. However, with the influx of project management styles managers need first-hand information on the best strategies for addressing the challenges facing their organizations. Positivism is, therefore, preferable over other philosophies because it allows for collection of quantifiable facts that is applied to conduct statistical analysis and determine the relationship between the dependent and independent variables.

### **3.3 Research Design**

The study's background suggests that the research design should consider the specific factors that impact Smart App Limited's project success rates. To this end, a mixed-method research design combining quantitative and qualitative approaches will be used. The mixed-method approach provided holistic details about the correlation between the dependent and independent variables in greater detail which is virtually impossible to achieve through quantitative or qualitative approaches alone.

The qualitative aspect of this study supported deeper inquiry into the innovative ways of enhancing project performance at Smart App Limited. This aspect of the study entails conducting interviews with project managers, analysing project documentation, and observing project management practices to identify key factors affecting project success rates. The qualitative approach helped in identifying challenges and gaps in current project management strategies and approaches.

The quantitative aspect of this study employed a Likert scale questionnaire that supports statistical analysis, yielding a multiple regression model for predicting the relationship between project management and performance levels. This approach enabled the researcher to identify the extent of the cause-and-effect relationship between project management styles and performance. Additionally, the quantitative approach helped in identify specific factors that significantly impact project success rates.

The mixed-method research approach yields vast knowledge of the phenomena, providing the managers at Smart App Limited with a deeper understanding of the emerging project management technologies and the need to conduct regular research to keep pace with fluctuations in the macro-environment. Furthermore, this approach provided actionable insights that can be used to improve

project management strategies and ultimately enhance Smart App Limited's performance.

### **3.4 Target Population**

This study targeted all the ongoing projects at Smart Applications Limited, including the project managers involved in these projects. These projects were selected based on their relevance to the company's main product line, which includes software development. There are 60 Project managers in Smart Application Limited as at 2023. This study aimed to investigate the factors that impact the success rates of these projects and identify strategies that can be implemented to improve project management practices and ultimately enhance performance.

### **3.5 Sample Size and Sampling Procedures**

Based on the specificity of the targeted information, the researcher used stratified sampling (Wagner et al., 2015). Abstract: This research will employ the census sampling technique to include all managers from four departments within Smart Applications Limited, an IT company. By encompassing all managers within these departments, the study aims to provide an exhaustive understanding of managerial perspectives across the organization, thereby enhancing the validity and reliability of the research findings.

Smart Applications Limited, an esteemed IT company, encompasses managers across four distinct departments, each integral to the organization's operations. To ensure a comprehensive examination of managerial practices, this research employs the census sampling technique, encompassing all managers from selected departments. This approach facilitates an in-depth analysis of managerial perspectives without the need for sampling, thus offering a complete representation of managerial practices within the organization.

Census sampling involves including the entire population of interest in the study, thereby eliminating the need for sampling (Thomson et al., 2020). In this case, all managers from selected departments, namely ICT, Accounting, Human Resources, and Marketing, are included in the research sample. This method ensures that every manager within these departments contributes to the study, providing a holistic view of managerial practices across the organization.

**Table 3.1 Distribution of Managers Across Departments**

<b>Department</b>	<b>Sampled Managers</b>
ICT	22
Accounting	11
Human Resources	16
Marketing	11
<b>Total</b>	<b>60</b>

**Source: author (2023)**

### **3.6 Data Collection Instruments and Procedures**

The researcher used questionnaires as the main tool for collecting primary data while a narrative literature review is instrumental in collecting secondary data and synthesizing pieces of evidence for supporting the main arguments (Boparai et al., 2018). The questionnaires comprise bio information, such as level of education, number of years at service at Smart Applications Limited Age and Gender, as well as, the respondents ‘viewpoints on the questions in line with the research objectives. Likert Scale will be instrumental in ranking the respondents ‘opinion on the extent to which various aspects of innovative project management affect Smart

Applications Limited ‘s profitability, quality of products and value maximization. Research indicates that the Likert-Scale questions advantages over other techniques include ease of data collection, generation of reports, results and graphs (Awang et al., 2016; Chyung et al., 2017)

Moreover, the researcher enjoyed an opportunity of conducting quantitative analysis once the responses have been received. The researcher relied on the company's WhatsApp page to recruit the targeted respondents. The questionnaires were sent to the potential participants via any of the social media platform or e-mail accompanied by a consent letter.

### **3.7 Research Instruments Reliability and Validity**

A study produces reliable results if the outcomes, main arguments, observations and conclusions are consistent, repeatable and are professionally derived (Forero et al., 2018). For example, the results of this study is reliable because different scholar can apply the same methodologies and derive similar outcomes. This study meets the expected quality standards and regulations guiding professional research work. First, the problem statement, objective and questions are based on a comprehensive analysis of existing literature as evident in the background. The researcher further provides a rich description of the protocols for data collection and analysis.

On the other hand, validity refers to the extent to which the study 's content and findings adhere to the required scientific rigor (Nowell and Albrecht, 2018). For example, preliminary research was conducted to determine the appropriateness of the study 's focus and avoid duplication of previously explored research questions (Tawfik et al., 2019). The researcher further employed data triangulation. Primary and secondary data was compared and contrasted leading to insightful results. Peer debriefing enable the researcher to make a number of adjustments in line with the course mates 'points of view. For example, the fellow researchers 'input helped to revise the questionnaires, as well as, the main correlation between the variables derived from the quantitative analysis. A reflection of the feedback from the supervisor was instrumental in eliminating any form of bias. Therefore, other researchers can follow the decision trail to derive almost similar results.

### 3.8 Data Analysis Methods

This research will adopt the multiple regression model below to establish the extent of correlation between project management styles and performance at Smart Applications Ltd.

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

Where Y is the independent variable (project performance)

$\alpha$  = constant (variables not studied but affects project performance at the firm)  $\beta$  = coefficient of

x

$\varepsilon$  = error term

x = dependent variables (Innovative project management practices) X1 = agile project management practices

X2 = use of project value monitoring tools such as ERP systems

X3= use of automated project team coordination tools

X4 = proactive risk management strategies

The model assumed a multivariate normal distribution. That is, any linear combination of the dependent and independent variables was normally distributed. It also based on the assumption that  $\alpha$  (constant) is accurately capture the effects of other project success factors not explored in the research. For example, regular training and development of personnel often enhance project performance but is not explicitly covered in the study. The latest version of Statistical package for the social sciences/SPSS (22) was applied in running the regression and analysing the findings.

### **3.9 Diagnostic Test**

#### **3.9.1 Normality Test**

The normality of the data was assessed by doing the Shapiro-Wilk test and the Kolmogorov-Smirnov test, since the sample size exceeded 50. The statistical analysis included the measurement of the significant value, as well as the assessment of the skewness and kurtosis. In order for the data to be considered regularly distributed, it is necessary for the probability value (sig) to exceed 0.05, as shown by Altman and Bland (1995), Ghasemi and Zahediasl (2012), and Mishra et al. (2019). Therefore, based on the Shapiro-Wilk test results, it is reasonable to assume that the data in all the tested datasets exhibit approximate normality.

#### **3.9.2 Multicollinearity**

The analysis of multicollinearity is employed to assess the strength of a linear association between two variables. In cases of perfect positive correlation, the two variables exhibit a positive relationship. Conversely, a value of negative 1 signifies a perfect negative correlation, indicating that as one variable increases, the other variable decreases (Taylor, 1990; Schober, Boer & Schwarte, 2018). In this study, multicollinearity was evaluated using the variance inflation factors (VIF). The presence of multicollinearity is indicated by VIF values exceeding 10 and tolerance values below 0.2. The assessment of multicollinearity in the variables was conducted by considering the tolerance value, with a threshold of 0.2 or higher, and the variance inflation factor (VIF), with a threshold of less than 10 (Miles, 2014).

#### **3.9.3 Heteroscedasticity Test**

The null hypothesis of this research posits that the error variance exhibits homoscedasticity. Consequently, if it is determined that the error term is really fluctuating, the null hypothesis is rejected. Heteroscedasticity in the data may be inferred when the error variance is not constant.

According to White (1980), failure to account for heteroscedasticity in a regression model might result in biased parameter values in the model estimate.

#### **3.9.4 Test Autocorrection**

Serial correlation, also known as autocorrelation, arises when the influence of one independent variable on another independent variable persists through time intervals, hence impacting the future values of the latter independent variable. The null hypothesis posits that there exists no first-order autocorrelation. According to Akter (2014) and White (1992), the Durbin-Watson statistic is expected to be within the range of 1.5 to 2.5 in order to indicate the lack of association between residual terms. The Durbin-Watson test was used in this investigation to examine the presence of autocorrelation.

In summary, based on the Durbin-Watson statistic, it can be inferred that serial autocorrelation is not a significant concern in the regression model under examination. The data do not suggest any substantial pattern or correlation among the residuals, and the model's results can be interpreted with confidence under the assumption of independent errors.

#### **3.9.5 Ethical Considerations**

The study observed all the research ethics protocols guiding professional studies of this caliber. First, the researcher was able to seek the targeted participants and give them autonomy, as far as, decision to participate or withdraw from this study is concerned (Östman and Turtiainen, 2016). The introduction letter attached at the begging of each questionnaire briefed them on the research 's study purpose, as well as, the right to withdraw from the study at any time they wish. The participants 'identities were protected by using numerical codes instead of their real names data privacy while confidentiality was maintained by not sharing the private information with the third parties.

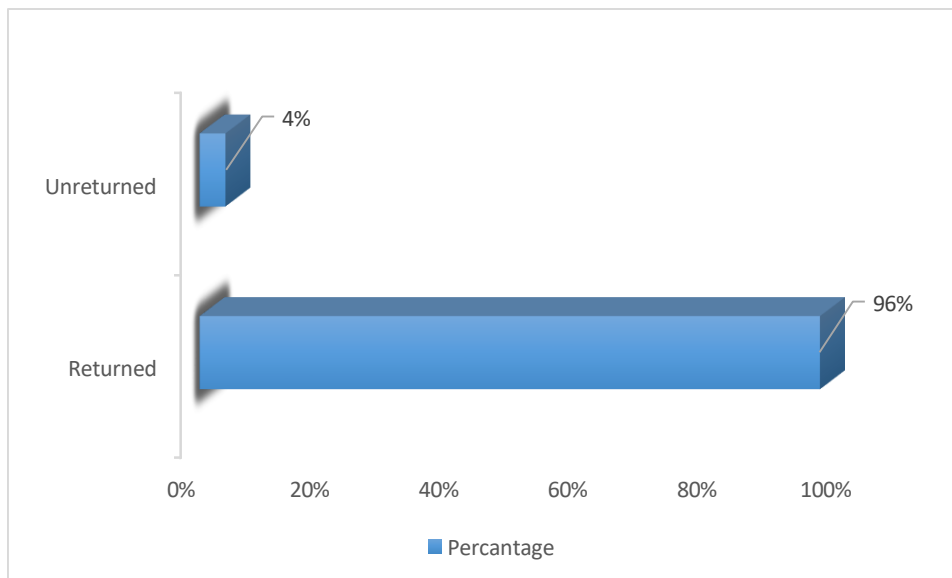
## CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND INTERPRETATION

### 4.1 Introduction

The chapter provides an exposition of the outcomes derived from the data that was subjected to analysis. The results were analysed in accordance with the study goals that were formulated to address the research issue, and subsequent interpretations of the findings were conducted. The data were analysed using descriptive and inferential statistics. The structure of the chapter is as follows: first, the response rate is discussed, followed by background information. Next, the chapter covers demographic information, reliability and validity analysis, descriptive analysis, diagnostic tests, and finally, a discussion of the research results.

### 4.2 Response Rate

The following findings illustrate the extent of respondents' collaboration in expressing their perspectives on the questions posed, which corresponded to various topics.



**Figure 4.1 Response Rate**  
**Source: Research Data (2023)**

A total of 54 questionnaires were distributed, all of which were completed and returned in a satisfactory manner. The response rate for this return was 90%, meaning there were 54 returned questionnaires and 6 unreturned questionnaires. Hardigan, Popovici, and Carvajal (2016) assert that a response rate over 50% is deemed satisfactory for descriptive research.

#### 4.2.1 Reliability Results

A reliability study was conducted in order to assess the survey construct, use Cronbach's alpha as the measure of reliability. Table 4.1 presents the reliability findings obtained from the pilot research.

**Table 4.1 Reliability Analysis**

<b>Variables</b>	<b>Cronbach's Alpha</b>	<b>Items</b>	<b>Conclusion</b>
Agile Management Practices	0.711	3	Reliable
Project Value Monitoring Tool	0.823	3	Reliable
Automated Project Team Coordination Techniques	0.945	3	Reliable
Proactive Risk Management	0.754	3	Reliable
Project Performance	0.701	3	Reliable

**Source: Research Data (2023)**

The findings presented in Table 4.1 demonstrate a high level of reliability for the variable statements. Cronbach's Alpha coefficients of 0.711, 0.823, 0.945, 0.754, and 0.701 were obtained for professional Agile Management Practices, Project Value Monitoring Tool, Automated Project Team Coordination Techniques, Proactive Risk Management, and Project performance, respectively. According to the findings of Park and Park (2013) and Kiliç (2016), a coefficient that is equal to or larger than 0.7 is considered appropriate in the context of fundamental research.

#### 4.2.2 Validity Analysis using Kaiser-Meyer-Olkin and Bartlett's Test

The present study used the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test to assess the validity of the data. The Kaiser-Meyer-Olkin (KMO) test is administered using the following

scales: According to Andale (2017), a score ranging from 0.90 to 1.00 is categorised as marvellous, while a score ranging from 0.80 to 0.89 is considered meritorious. Furthermore, a score ranging from 0.70 to 0.79 falls under the middling category, while a score ranging from 0.60 to 0.69 is classified as mediocre. Additionally, a score ranging from 0.40 to 0.59 is categorised as miserable, and scores ranging from 0.00 to 0.40 are advised not to be included. The test was used to statistically validate the principal component analysis technique utilised for confirming the elements of the investigation. The findings are shown in Table 4.2.

**Table 4.2 Factorial Test Results**

	KMO	Bartlett's Test of Sphericity		Validity
		Approx. Chi-Square	Df Sig.	
Agile Management Practices	0.6866	0.051	12 0	Valid
Project Value Monitoring Tool	0.7195	0.148	12 0	Valid
Automated Project Team Coordination Techniques	0.724	28.144	12 0	Valid
Proactive Risk Management	0.5976	2.539	12 0	Valid
Project Performance	0.7768	9.036	12 0	Valid

**Source: Researcher Data (2023)**

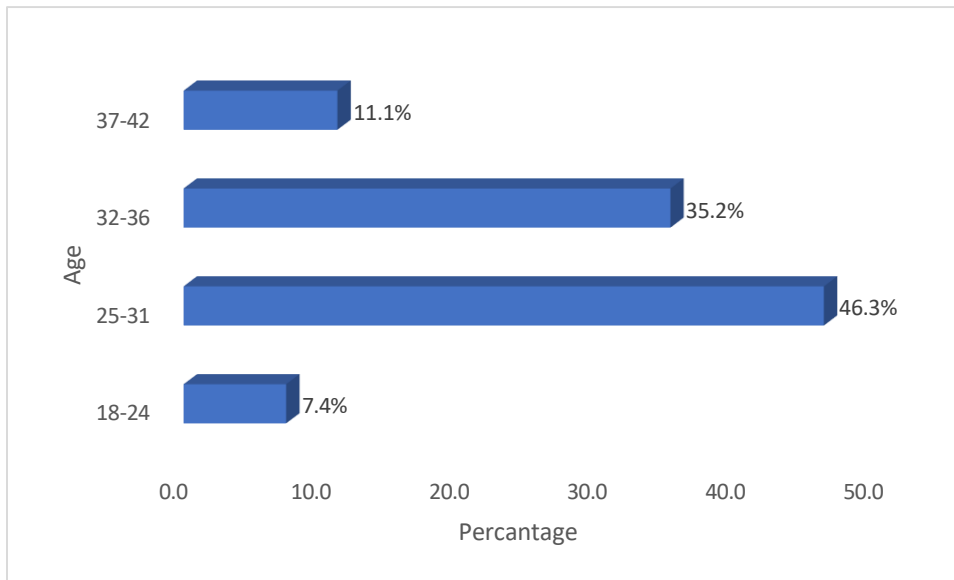
Table 4.2.2 demonstrates that the Kaiser-Meyer-Olkin (KMO) values for all variables examined in this study had significance levels  $< 0.050$ . The findings further suggest that there was a notable level of sample adequacy for all the variables, as shown by Kaiser-Meyer-Olkin (KMO) values over 0.4 and a p-value below 0.05. This suggests that the statements used in the study were both statistically significant and logically sound in elucidating the criteria that were chosen.

### 4.3 Socio- Demographic Characteristics of Participants

In Section 4.3, the traits of the people who took part in the study are listed.

#### 4.3.1 Age of Respondents

Figure 4. 2 presents the demographic information pertaining to the age distribution of the respondents. A total of 54 people provided responses to the survey questions.



**Figure 4.2 Age Frequency**

**Source: Research Data (2023)**

Table 4.2 outlines the demographic distribution of survey respondents based on their age. This information is crucial for understanding the composition of the surveyed population in terms of age groups. The table categorizes respondents into four distinct age brackets, allowing for a comprehensive analysis of the age-related characteristics of the sample.

The first category, 18-24, represents a relatively small portion of the total population surveyed, comprising 7.4%. This age group's representation suggests that a minority of individuals in the

sample fall within this younger demographic range. From an organizational standpoint, this implies that there may be fewer managers or employees within Smart Applications Limited who are in the early stages of their careers or have recently entered the workforce. Consequently, this could impact factors such as leadership experience, decision-making capabilities, and perspectives on workplace dynamics within the company. Additionally, the relatively low percentage of individuals aged 18-24 may indicate potential challenges or opportunities related to succession planning, as there may be fewer individuals in this age group poised to assume higher-level managerial roles in the future. Understanding the demographics of this age category is crucial for assessing workforce dynamics and implementing strategies to support career development and organizational growth.

The substantial representation of respondents in the "25-31" age group, constituting 46.3% of the total sample, could imply that a significant portion of the target audience or user base falls within the mid to late twenties and early thirties. This demographic information is valuable for the company as it aids in tailoring their products and services to cater specifically to the preferences and needs of this age group. Understanding the characteristics and preferences of individuals in this age range allows Smart Applications Ltd to develop and market applications that resonate with the lifestyle and interests of this demographic, potentially leading to increased user engagement and customer satisfaction.

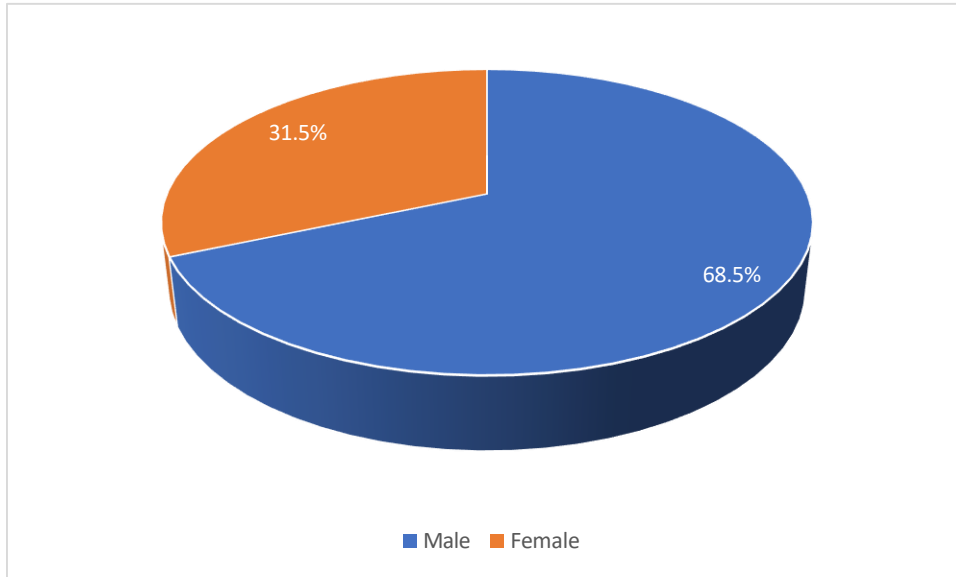
The age category 32-36 encompasses a significant portion of the population surveyed, representing 35.2% of the total sample. This age group's prominence suggests that a substantial proportion of individuals within Smart Applications Limited fall within the mid-career stage. From an organizational perspective, this implies that a considerable number of managers and employees are likely to possess a substantial amount of professional experience and expertise. They may have

progressed beyond entry-level roles and could be assuming more significant responsibilities within the company. This age group's representation may also indicate a critical phase in career development, where individuals are likely to be at a stage of consolidating their skills, pursuing advancement opportunities, and potentially taking on leadership roles within their respective departments. Understanding the demographics of the 32-36 age category is essential for tailoring organizational development initiatives, succession planning efforts, and leadership training programs to meet the specific needs and aspirations of this cohort within the company.

Finally, the "37-"60 age group, the smallest in terms of respondents, comprises six individuals, representing 11.1% of the total sample. These respondents are among the older segment of the surveyed population, this insight could be instrumental in developing applications that cater to the preferences and requirements of this age group. The company may consider incorporating features or functionalities that align with the technological preferences and lifestyle choices of individuals in their mid-thirties. By doing so, Smart Applications Ltd can enhance its market appeal and better meet the expectations of this demographic segment.

#### **4.3.2 Gender of the Respondents**

Figure 4. 3 provides a comprehensive overview of the demographic distribution of survey respondents based on their gender. It is a fundamental aspect of demographic analysis and aids in understanding the composition of the surveyed population concerning gender identity.



**Figure 4.3 Gender**  
**Source: Author (2023)**

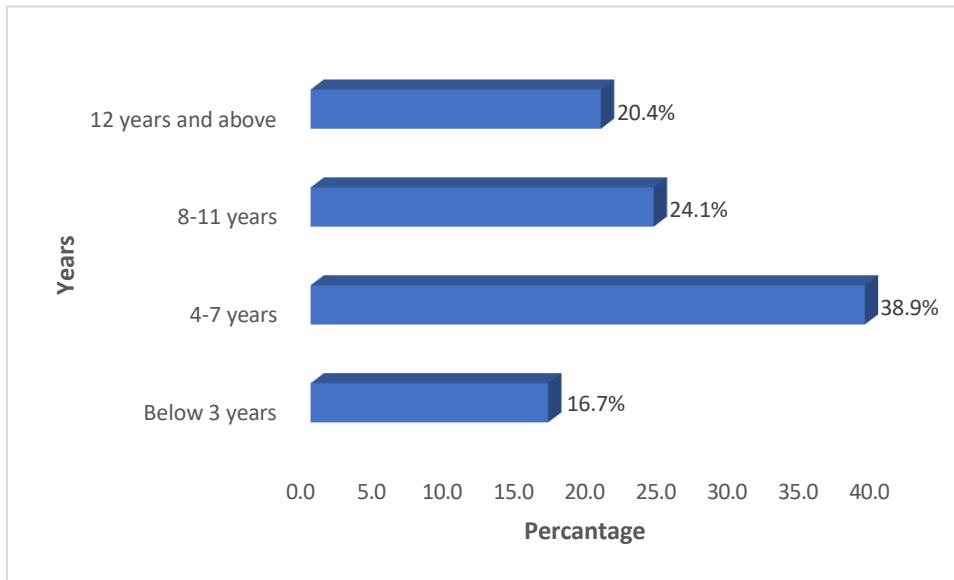
The gender dynamics within Smart Applications Limited, as reflected in the provided data, showcase a notable majority of male employees, constituting 68.5% of the surveyed population, compared to 31.5% female representation. This gender disparity suggests potential imbalances in the organization's workforce composition. Such a skew towards male representation might indicate underlying challenges related to diversity and inclusion within the company. It could signify a need for proactive measures to address gender equality issues in recruitment, retention, and promotion practices. Additionally, the predominant presence of males may influence workplace dynamics, decision-making processes, and organizational culture, potentially shaping the overall employee experience within Smart Applications Limited.

Furthermore, the gender imbalance highlighted in the data could have implications for talent management and succession planning strategies within the organization. A predominantly male workforce may impact the pipeline for leadership roles, as well as the availability of role models and mentors for female employees. This disparity might lead to challenges in fostering a supportive

and inclusive work environment where all employees have equal opportunities for advancement and professional growth. Addressing gender diversity and inclusion concerns becomes imperative not only for promoting fairness and equity but also for leveraging diverse perspectives and talents to drive innovation and organizational success.

To effectively address the gender dynamics within Smart Applications Limited, the organization may need to implement targeted initiatives aimed at promoting gender diversity and inclusion across all levels. This could involve implementing policies and practices that support gender balance in recruitment, providing training on unconscious bias and diversity awareness, establishing mentorship programs for female employees, and creating a culture that values and celebrates diversity. By fostering an environment where all employees feel valued, respected, and empowered to contribute their unique perspectives, Smart Applications Limited can cultivate a more inclusive and dynamic workplace culture that drives employee engagement, innovation, and long-term success.

#### 4.4 Work Experience of Respondents



**Figure 4.4: Work experience of Respondents**  
**Source: Author (2023)**

The provided table offers valuable insights into the work experience of the survey respondents. It categorizes respondents into four distinct groups based on their number of years of work experience. This segmentation allows for a nuanced understanding of the composition of the surveyed population in terms of their professional experience.

For the "Below 3 years" category, comprising 16.7% of the total respondents, Smart Applications Ltd can interpret this data as an indication of a notable presence of early-career professionals in their user base or target audience. Recognizing the demographic composition of individuals with less than three years of work experience is crucial for the company. It may influence the design and features of applications to cater to the specific needs and preferences of those who are relatively new to their respective fields. Smart Applications Ltd might consider incorporating user-friendly interfaces, introductory guides, or educational features to support and engage this segment

of users effectively. Additionally, understanding the dynamics of this group could guide the company in offering career development tools or resources within its applications.

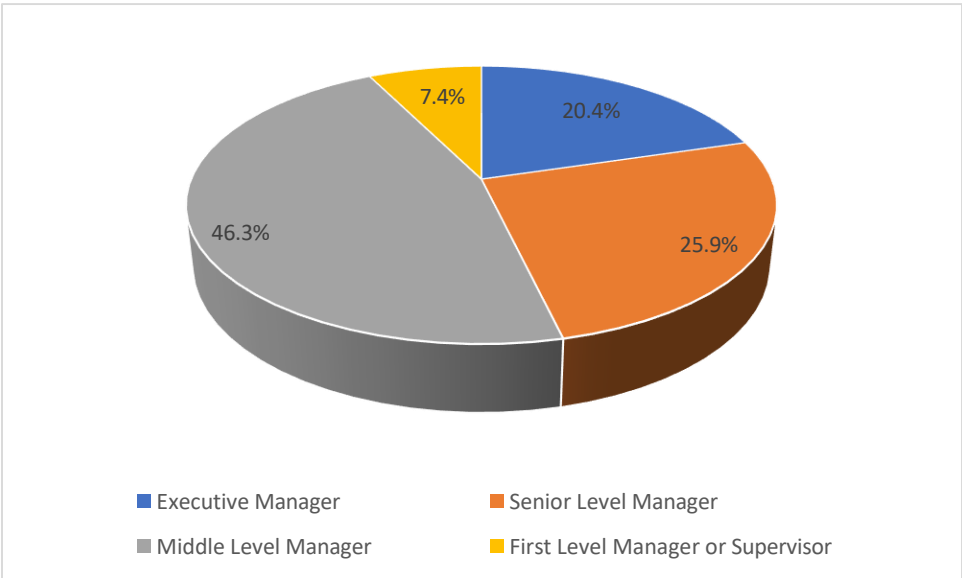
For the "4-7 years" category, representing the largest group at 38.9%, Smart Applications Ltd may see this as an opportunity to target a substantial portion of mid-level professionals. This group likely has a moderate level of expertise and experience in their fields. The company could leverage this insight to design applications with features that align with the career goals and challenges faced by individuals in this mid-range of professional experience. This might include advanced tools, career progression resources, or collaborative features that cater to the needs of those with several years of work experience. Developing applications that resonate with this demographic could enhance user engagement and loyalty.

In the "8-11 years" category, comprising 24.1% of the respondents, Smart Applications Ltd can recognize the presence of experienced professionals with a substantial career trajectory. This demographic insight suggests the potential for the company to provide advanced and sophisticated features within its applications. Tailoring products to meet the needs of seasoned professionals may involve incorporating advanced functionalities, networking opportunities, or tools for career advancement. Understanding the preferences of this group allows Smart Applications Ltd to position itself as a valuable resource for professionals with a decade or more of experience, potentially fostering long-term user relationships.

Lastly, for the "12 years and above" category, representing 20.4% of the respondents, Smart Applications Ltd can acknowledge the presence of highly experienced and seasoned professionals in its user base or target audience. This group may have unique needs and expectations, such as access to niche expertise, executive-level resources, or advanced career management tools. By

recognizing and addressing the requirements of this demographic, Smart Applications Ltd can position itself as a go-to platform for individuals with extensive experience, thereby solidifying its reputation as a comprehensive solution provider in the professional development and career management space.

### 4.5 Role of Respondents in the Company



**Figure 4.5 Role of Respondents**

**Source: Author (2023)**

The provided demographics data represents the distribution of roles within a company, showcasing the various managerial positions that employees hold. In total, there are 54 individuals included in this analysis. These positions are categorized into four distinct levels, each with its own unique responsibilities and functions.

For the Executive Manager category, comprising 20.4% of the workforce, Smart Applications Ltd can interpret this as a reflection of a relatively top-heavy organizational structure. The presence of a significant proportion of executive-level roles suggests a focus on strategic decision-making and leadership within the company. This demographic insight is vital for Smart Applications Ltd as it indicates a need for high-level features and functionalities in its applications.

The company might consider incorporating tools tailored for executive decision-makers, such as advanced analytics, strategic planning modules, or leadership development resources. Understanding the prevalence of executive roles can guide the development of applications that cater to the specific needs and expectations of top-tier management.

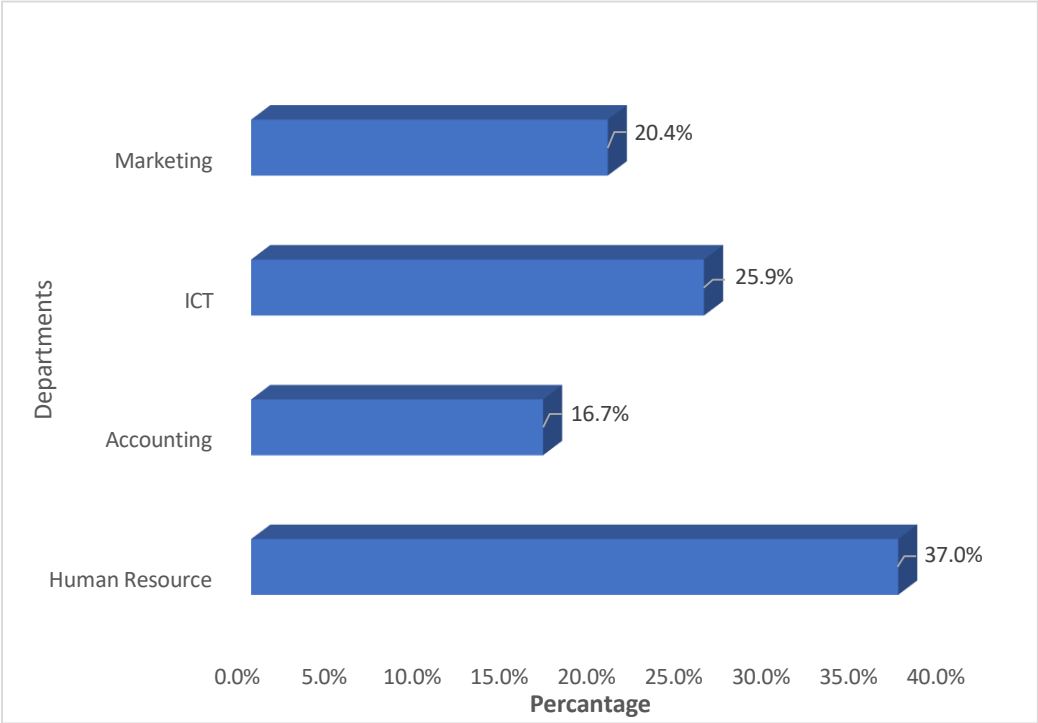
For the Senior Level Manager category, representing 25.9% of the workforce, Smart Applications Ltd can recognize a substantial presence of mid-to-senior level leadership. This insight suggests a need for features and tools that cater to the responsibilities and challenges faced by individuals in these managerial positions. The company might consider incorporating collaborative tools, project management features, or resources focused on leadership development. Understanding the role distribution within this category enables Smart Applications Ltd to tailor its applications to meet the demands of this specific managerial level, enhancing their relevance and usefulness for this segment of users.

In the Middle Level Managers category, constituting the largest portion at 46.3% of the workforce, Smart Applications Ltd can interpret this data as an indication of a significant concentration of mid-level leadership roles. This demographic insight is crucial for the company as it suggests a need for features and functionalities that cater to the specific challenges and responsibilities faced by middle-level managers. Applications could be designed with tools for team collaboration,

project management, and communication, recognizing the importance of these aspects in the daily operations of middle management. This understanding allows Smart Applications Ltd to position itself as a valuable resource for professionals at this managerial level, potentially fostering long-term user engagement.

Lastly, for the First Level Managers or Supervisors category, representing 7.4% of the workforce, Smart Applications Ltd can acknowledge the presence of frontline managerial roles. This demographic insight suggests a potential focus on features that support task management, team coordination, and communication at the operational level. Applications could be tailored to address the specific needs of supervisors, such as shift scheduling tools, performance tracking features, or training resources. Recognizing the significance of these roles allows Smart Applications Ltd to develop applications that cater to the diverse managerial levels within organizations, promoting inclusivity and ensuring its products are relevant across the entire managerial hierarchy.

### 4.6 Department of Work of the Respondents



**Figure 4.6 Department of Work**

**Source: Research Data (2023)**

The provided Figure illustrates the distribution of employees across different departments within a company. It gives valuable insights into how the workforce is distributed across various functional areas, shedding light on the organization's structure and focus.

For the HR department, constituting 37.0% of the total workforce, Smart Applications Ltd can interpret this data as an indication of the company's emphasis on fostering a positive work environment, employee engagement, and talent management. Recognizing the significant presence of HR professionals suggests that the company values its human capital and prioritizes employee well-being. This demographic insight can guide Smart Applications Ltd in tailoring its applications to include features that support employee engagement, performance management, and professional

development. Additionally, understanding the focus on HR can lead to the development of tools that streamline recruitment processes, training programs, and employee satisfaction surveys, contributing to the overall effectiveness of human resource management within the organization.

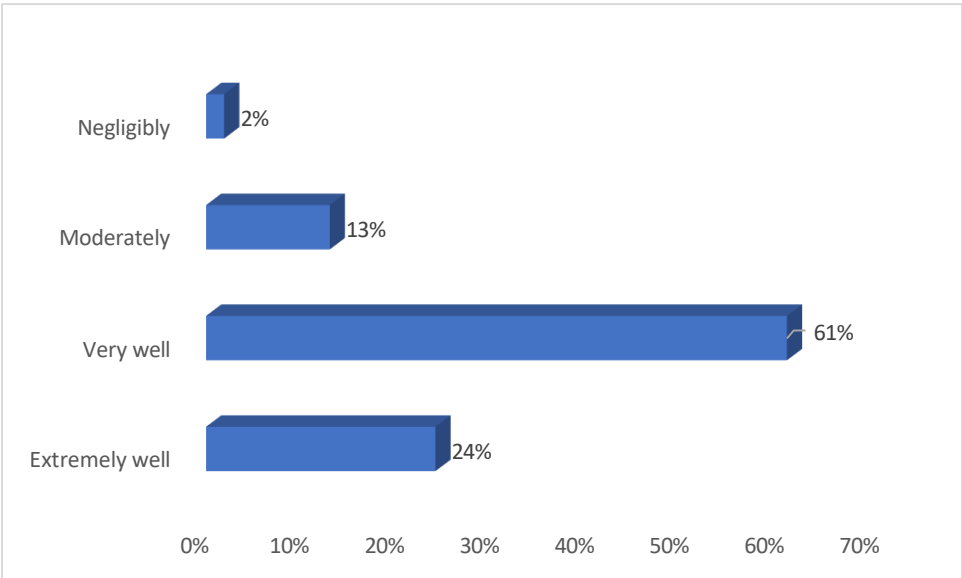
For the Accounting department, representing 16.7% of the workforce, Smart Applications Ltd can recognize the importance of financial management and reporting within the company. This demographic insight suggests a need for features that cater to the specific requirements of accounting professionals. Applications could include financial reporting tools, expense tracking features, and budget management functionalities. Understanding the distribution within the accounting department allows Smart Applications Ltd to develop applications that contribute to efficient financial processes, helping the company maintain financial health and compliance.

In the Information and Communication Technology (ICT) department, constituting 25.9% of the workforce, Smart Applications Ltd can interpret this as a significant emphasis on technology and innovation. The substantial presence of ICT professionals indicates the importance the company places on developing and maintaining cutting-edge technology solutions. This demographic insight is crucial for the company as it can guide the development of applications with advanced features, security measures, and integration capabilities. Recognizing the significance of the ICT department allows Smart Applications Ltd to position itself as a technology-driven company, offering solutions that align with the evolving needs of its user base and industry trends.

Lastly, for the Marketing department, representing 20.4% of the workforce, Smart Applications Ltd can acknowledge the importance of strategic marketing and brand awareness efforts. A strong presence in this department suggests that the company values its market positioning and customer engagement initiatives. This demographic insight can guide Smart Applications Ltd in developing

applications that support marketing professionals in their efforts to promote products or services, analyse market trends, and engage with customers. Tailoring applications to meet the specific needs of the Marketing department can contribute to the overall success of the company's branding and promotional strategies.

#### 4.8 Expertise on Agility Project Management Methodology



**Figure 4.7 Expertise on Agility Project Management**

**Source: Author (2023)**

The provided Figure offers valuable insights into the level of understanding of the Agile project management methodology among a group of individuals, possibly within a company or project team. Respondents were asked to rate their understanding on a scale ranging from 1 to 5, with 1 being the lowest level of understanding and 5 indicating the highest level of comprehension.

For the 61.1% of respondents who indicated a strong understanding of Agile project management, Smart Applications Ltd can interpret this as a positive sign of a workforce that is well-versed in Agile principles. This demographic insight suggests that the company may have a pool of employees ready to adopt Agile methodologies in their work. For Smart Applications Limited, this means an opportunity to implement Agile practices seamlessly across various projects. The company can leverage this knowledge to encourage collaborative and iterative development processes, potentially leading to more efficient and adaptable software development cycles. Moreover, understanding the high level of familiarity with Agile principles allows Smart Applications Ltd to focus on advanced Agile training and tools to further enhance the productivity and effectiveness of its development teams.

For the 24.1% of respondents who reported an "Extremely well" understanding of Agile, Smart Applications Ltd can recognize this subset as a valuable resource for Agile expertise within the organization. These individuals may serve as champions for Agile implementation, helping disseminate best practices and guiding teams in Agile methodologies. The company can consider tapping into this group for mentorship programs, knowledge-sharing sessions, or even involving them in Agile leadership roles. Leveraging the deep understanding of Agile within this subset can contribute to the successful adoption and optimization of Agile practices across the organization.

Regarding the 13% who mentioned a "Moderate" understanding of Agile, Smart Applications Ltd can view this group as having a foundational knowledge of Agile principles but with room for growth. This demographic insight indicates an opportunity for the company to provide targeted training programs, workshops, or resources to bridge the gap and enhance the proficiency of this segment. Recognizing the moderate level of familiarity allows Smart Applications Ltd to

implement tailored strategies for upskilling, ensuring that all team members are well-equipped to contribute effectively to Agile projects.

Finally, for the 1.9% of respondents who indicated understanding Agile "A little bit," Smart Applications Ltd can see this as an area for potential improvement and educational intervention. This individual likely requires focused training or educational initiatives to bring them up to speed with Agile methodologies. Smart Applications Ltd can consider implementing entry-level training programs or providing resources specifically designed for beginners in Agile project management, fostering a culture of continuous learning and development within the organization.

#### **4.9 Descriptive Statistics**

The table summarizes responses from 54 individuals who have assessed Smart Application Ltd's independent and dependent variables. Each dimension or statement reflects a different facet of the company's approach.

##### **4.9.1 Agile Management Practices**

The presented table offers a detailed view of responses from a survey or assessment focusing on the perceptions of Agile management practices within a specific organization, potentially Smart Application Ltd. The survey aimed to gauge the degree of agreement or disagreement among respondents regarding the impact of Agile practices on various aspects of the company's operations. Each statement in the table addresses a different facet of Agile management, and the respondents provided their feedback on a scale ranging from "Strongly Agree" to "Strongly Disagree." Furthermore, the table includes valuable summary statistics, such as the mean and standard deviation, which help provide context to the responses.

**Table 4.3 Agile Management Practices**

	Mean	Standard Deviation
Adopting agile management practices enabled Smart Application Ltd. to achieve significant cost savings	N=1.70	.50
Agile management practices have enabled the company to preserve scarce limited resources without necessarily affecting the quality of the outcome?	N=1.89	.57
Adoption of agile management practices places Smart Application Ltd. in a better position to minimize costs of undertaking projects, as well as, achieve desired profitability levels?	N=1.70	.60

**Source: Research Data (2023)**

For the first statement, "Adopting agile management practices enabled Smart Application Ltd. to achieve significant cost savings," the mean of 1.70 suggests that the respondents, on average, tend to agree that adopting agile practices led to significant cost savings. The standard deviation of 0.50 indicates that responses are relatively consistent around the mean, suggesting a relatively narrow range of opinions among respondents. This implies a high level of agreement among respondents regarding the cost-saving benefits of adopting agile practices.

Similarly, for the statement, "Agile management practices have enabled the company to preserve scarce limited resources without necessarily affecting the quality of the outcome," the mean of 1.89 suggests a stronger agreement among respondents compared to the first statement. The standard deviation of 0.57 indicates a slightly higher variability in responses compared to the first statement, but still within a relatively narrow range. This implies that while there is a high level of agreement regarding the preservation of resources through agile practices, there may be slightly more variability in opinions among respondents compared to the first statement.

Lastly, for the statement, "Adoption of agile management practices places Smart Application Ltd.

in a better position to minimize costs of undertaking projects, as well as, achieve desired profitability levels," the mean of 1.70 aligns with the first statement, indicating a high level of agreement among respondents regarding the benefits of agile practices for cost minimization and profitability. The standard deviation of 0.60 suggests slightly more variability in responses compared to the first statement, indicating a wider range of opinions among respondents. This implies that while there is still overall agreement regarding the benefits of agile practices for cost minimization and profitability, there may be some divergence in opinions among respondents regarding the extent of these benefits.

#### 4.9.2 Project Value Monitoring Tool

**Table 4.4: Project Value Monitoring Tool**

	Mean	Standard Deviation
The speed and coordination of projects at Smart Application Ltd. is at par with the industry leaders due to the adoption of ERP system	1.96	.51
Smart Application Ltd.'s ERP system has eliminated the duplication of tasks that affected the efficiency of project management	1.80	.53
ERP has enhanced the accuracy of project planning and execution at Smart Application Ltd.	1.74	.59

**Source: Research Data (2023)**

For the statement, "The speed and coordination of projects at Smart Application Ltd. is at par with the industry leaders due to the adoption of ERP system," the mean of 1.96 indicates a strong agreement among respondents that the ERP system has positively influenced the speed and coordination of projects. The relatively low standard deviation of 0.51 suggests a narrow range of opinions among respondents, indicating a high level of consensus regarding the ERP system's effectiveness in this aspect. This implies that respondents perceive the ERP system as a significant contributor to Smart Application Ltd.'s ability to compete effectively within the industry.

Regarding the statement, "Smart Application Ltd.'s ERP system has eliminated the duplication of tasks that affected the efficiency of project management," the mean of 1.80 indicates a solid agreement among respondents regarding the ERP system's role in eliminating task duplication and improving efficiency. The standard deviation of 0.53 suggests a slightly wider range of opinions compared to the first statement, but still within a relatively narrow range. This implies that while there is overall agreement regarding the effectiveness of the ERP system in reducing task duplication, there may be some variability in opinions among respondents regarding the extent of its impact.

Lastly, for the statement, "ERP has enhanced the accuracy of project planning and execution at Smart Application Ltd.," the mean of 1.74 suggests a strong agreement among respondents regarding the ERP system's positive impact on project planning and execution accuracy. The standard deviation of 0.59 indicates a slightly wider range of opinions compared to the previous statements, suggesting some variability in responses. This implies that while there is overall agreement regarding the ERP system's role in enhancing accuracy, there may be some divergence in opinions among respondents regarding the degree of improvement.

Overall, the responses indicate a positive perception of the ERP system's effectiveness in improving project speed, coordination, efficiency, and accuracy at Smart Application Ltd., with respondents generally agreeing on its beneficial impact.

#### 4.9.3 Automated Project Team Coordination Techniques

**Table 4.5 Automated Project Team Coordination Techniques**

	Mean	Standard Deviation
Seamless coordination among the various project team members have always ensured that the project outcomes exceed the targeted goals	1.74	.59
Team members enjoy competitive edge in predicting clients 'needs and producing products that surpasses their expectations as a result of access to forums for exchanging ideas and decision making	1.85	.49
Use of automated team coordination technologies ensures that Smart Application Limited 's product are superior as compared to the substitutes	1.83	.54

**Source: Research Data (2023)**

For the statement, "Seamless coordination among the various project team members have always ensured that the project outcomes exceed the targeted goals," the mean of 1.74 indicates a strong agreement among respondents that automated coordination techniques contribute to surpassing project goals. The standard deviation of 0.59 suggests a moderate range of opinions among respondents, indicating some variability in perceptions regarding the extent of the impact. This implies that while there is overall agreement regarding the effectiveness of automated coordination, there may be some diversity in opinions among respondents regarding the degree of improvement.

Regarding the statement, "Team members enjoy a competitive edge in predicting clients' needs and producing products that surpass their expectations as a result of access to forums for exchanging ideas and decision making," the mean of 1.85 indicates a strong agreement among respondents regarding the benefits of automated coordination in enhancing product quality and meeting client expectations. The standard deviation of 0.49 suggests a relatively narrow range of opinions among respondents, indicating a high level of consensus regarding the perceived benefits. This implies that respondents generally agree on the significant positive impact of automated coordination techniques on meeting client needs and producing superior products.

Lastly, for the statement, "Use of automated team coordination technologies ensures that Smart Application Limited's products are superior as compared to substitutes," the mean of 1.83 indicates a strong agreement among respondents regarding the superiority of Smart Application Limited's products due to automated coordination techniques. The standard deviation of 0.54 suggests a moderate range of opinions among respondents, indicating some variability in perceptions regarding the extent of product superiority. This implies that while there is overall agreement

regarding the benefits of automated coordination, there may be some diversity in opinions among respondents regarding the degree of product superiority.

Overall, the responses indicate a positive perception of the effectiveness of automated project team coordination techniques at Smart Application Limited, with respondents generally agreeing on their beneficial impact on project outcomes, product quality, and competitiveness.

#### 4.9.4 Proactive Risk Management

**Table 4.6 Proactive Risk Management**

	Mean	Standard Deviation
The proactive risk management practices by Smart Application Ltd account for the continued growth in productivity of the company’s project team members	1.67	.55
Smart Application Limited ‘s ability to predict and avoid unfavorable market changes has always enabled the company to surpass project ‘s goals	1.87	.62
Smart Application Ltd value maximization processes are attributable to its proactive risk management styles	1.89	.66

**Source: Research Data (2023)**

The mean for the statement "Seamless coordination among the various project team members have always ensured that the project outcomes exceed the targeted goals" is 1.74, with a standard deviation of 0.59. This suggests that there is generally a positive perception among respondents regarding the effectiveness of seamless coordination in surpassing project goals. The lower standard deviation indicates a relatively moderate level of agreement among respondents, implying that while most agree with the statement, there is some variability in opinions. The implication of this finding is that fostering seamless coordination within project teams is viewed as important for achieving project success. However, there may be some variation in how individuals perceive the extent to which it contributes to surpassing goals.

The mean for the statement "Team members enjoy competitive edge in predicting clients' needs and producing products that surpass their expectations as a result of access to forums for exchanging ideas and decision making" is 1.85, with a standard deviation of 0.49. This indicates a slightly higher level of agreement compared to the previous statement, with respondents generally perceiving that access to forums for exchanging ideas and decision-making provides a competitive edge in meeting client needs and exceeding expectations. The lower standard deviation suggests a more consistent agreement among respondents, implying a stronger consensus regarding the benefits of such forums. The implication here is that providing platforms for idea exchange and decision-making can lead to a competitive advantage in understanding and satisfying client needs, contributing to superior project outcomes.

The mean for the statement "Use of automated team coordination technologies ensures that Smart Application Limited's products are superior as compared to substitutes" is 1.83, with a standard deviation of 0.54. This indicates a similar level of agreement to the second statement, with

respondents generally agreeing that automated team coordination technologies contribute to the superiority of Smart Application Limited’s products compared to substitutes. The standard deviation suggests a moderate level of variability in opinions, indicating that while there is general agreement, there are some differing views among respondents. The implication here is that leveraging automated team coordination technologies is perceived as beneficial for maintaining a competitive edge in the market by delivering superior products. However, it also suggests that there may be some variability in how individuals perceive the extent of this impact.

Overall, these results indicate a generally positive perception of Smart Application Ltd.’s proactive risk management practices, with a majority of respondents either strongly agreeing or agreeing with the statements. The mean scores for all three statements are above 1.5, further supporting the notion of a favourable view of the company's risk management strategies among the surveyed individuals.

**4.4.5 Project Performance Table 4.4.5 Project Performance**

	<b>Mean</b>	<b>Standard Deviation</b>
Do you believe using Agile methodology in project management has improved project outcomes at Smart Applications Limited?	1.94	.71
Do you believe that Agile methodology improves flexibility and adaptability in project management?	1.81	.59
How important is project management to the success of Smart Applications Limited?	1.89	.60

**Source: Author (2023)**

The mean for the statement "Do you believe using Agile methodology in project management has improved project outcomes at Smart Applications Limited?" is 1.94, with a standard deviation of 0.71. This indicates a generally positive perception among respondents regarding the impact of Agile methodology on project outcomes. The higher mean suggests a relatively strong agreement that Agile methodology has indeed led to improvements in project outcomes at Smart Applications Limited. However, the higher standard deviation implies some variability in opinions, suggesting that while many respondents believe in the positive impact of Agile methodology, there are also some who may hold differing views. The implication here is that Agile methodology is perceived as beneficial for enhancing project outcomes, but there may be some diversity in perspectives among respondents.

The mean for the statement "Do you believe that Agile methodology improves flexibility and adaptability in project management?" is 1.81, with a standard deviation of 0.59. This suggests a generally positive perception regarding the role of Agile methodology in enhancing flexibility and adaptability in project management. The mean indicates a moderate level of agreement among respondents, implying that while there is a belief in the benefits of Agile methodology for improving flexibility and adaptability, it may not be as strongly held as the belief in its impact on project outcomes. The lower standard deviation indicates a more consistent level of agreement among respondents, implying a relatively stronger consensus regarding this aspect of Agile methodology. The implication here is that Agile methodology is seen as contributing to greater flexibility and adaptability in project management practices, albeit with some variability in the strength of belief among respondents.

The mean for the statement "How important is project management to the success of Smart Applications Limited?" is 1.89, with a standard deviation of 0.60. This suggests a generally high

level of importance attributed to project management in the success of Smart Applications Limited. The higher mean indicates a strong agreement among respondents regarding the significance of project management to the company's success. The standard deviation, although slightly higher compared to the previous statement, still suggests a relatively consistent level of agreement among respondents. The implication here is that project management is widely recognized as a crucial factor in ensuring the success of Smart Applications Limited, with a high level of consensus among respondents regarding its importance.

#### 4.10 Diagnostic Testing

The field of diagnostics aims to detect any biases that may arise in research. The tests conducted include the linearity test, normalcy test, multicollinearity test, heteroscedasticity test, and autocorrelation test. The linearity of the connection between two continuous variables was assessed via the use of scatter plots. This graphical tool is often employed to visually examine the presence of a linear association between the variables under investigation. Prior to using regression models, it is often anticipated that the connection between variables should exhibit a somewhat linear pattern (Casson & Farmer, 2014).

**Table 4.7 ANOVA Table**

Sum of Squares	df	Mean Square	F	Sig.		
Project Performance Between	(Combined)	4.632	7	.662	4.838	.000
* Proactive Risk		3.996	1	3.996	29.216	.000
Groups Linearity Deviation from Linearity		.636	6	.106	.775	.594
Management Within Group		6.292	46	.137		

**Source: Research Data (2023)**

**Table 4.8 Measures of Association**

R	R Squared	Eta	Eta Squared
Project Performance * Proactive Management	.605	.366	.651 .424 Risk

**Source: Research Data (2023)**

The table reports a significant effect related to "Linearity" with a mean square of 3.996 and an F-statistic of 29.216. The p-value (Sig.) is 0.000, indicating that this effect is statistically significant. This suggests that there is a significant linear relationship between the variables "Project Performance" and "Proactive Risk Management." In other words, as one variable changes, the other tends to change in a linear fashion. In table 4.8, this part of the table examines whether there are deviations from linearity. The mean square is 0.106, and the F-statistic is 0.775, but the p-value (Sig.) is 0.594, indicating that this effect is not statistically significant. Therefore, there is no significant deviation from linearity in the relationship between these two variables.

**4.10.1 Normality Test**

The normality of the data was assessed by doing the Shapiro-Wilk test and the Kolmogorov-Smirnov test, since the sample size exceeded 50. The statistical analysis included the measurement of the significant value, as well as the assessment of the skewness and kurtosis. In order for the data to be considered regularly distributed, it is necessary for the probability value (sig) to exceed 0.05, as shown by Altman and Bland (1995), Ghasemi and Zahediasl (2012), and Mishra et al. (2019).

**Table 4.9 Tests of Normality**

Kolmogorov-Smirnov <sup>a</sup> Statistic		df	Sig.	Shapiro-Wilk Statistic		
					df	Sig.
Agile Management Practices	<u>.190</u>	54	.456	.928	54	.503
Project Value Monitoring Tool	.220	54	.067	.918	54	.201
Automated Project Coordination Techniques	Team .216	54	.778	.924	54	.302
Proactive Risk Management	.192	54	.054	.922	54	.082
Project Performance	.231	54	.067	.909	54	.891

**Source: Research Data (2023)**

In statistics, a common threshold for determining normality is to consider the distribution as approximately normal if the p-value from the Shapiro-Wilk test is greater than 0.05 (i.e.,  $p > 0.05$ ). If the p-value is less than 0.05, it suggests that the data significantly deviates from a normal distribution. Looking at the results in the table, for each dataset or variable, the p-values obtained from the Shapiro-Wilk test are all greater than 0.05. Specifically, they range from 0.082 to 0.503.

Since all the p-values are greater than 0.05, there is no strong evidence to suggest that any of the tested datasets significantly deviate from a normal distribution. Therefore, based on the Shapiro-Wilk test results, it is reasonable to assume that the data in all the tested datasets exhibit approximate normality.

**4.10.2 Multicollinearity**

The analysis of multicollinearity is employed to assess the strength of a linear association between two variables. In cases of perfect positive correlation, the two variables exhibit a positive relationship. Conversely, a value of negative 1 signifies a perfect negative correlation, indicating

that as one variable increases, the other variable decreases (Taylor, 1990; Schober, Boer & Schwarte, 2018). In this study, multicollinearity was evaluated using the variance inflation factors (VIF). The presence of multicollinearity is indicated by VIF values exceeding 10 and tolerance values below 0.2. The assessment of multicollinearity in the variables was conducted by considering the tolerance value, with a threshold of 0.2 or higher, and the variance inflation factor (VIF), with a threshold of less than 10 (Miles, 2014).

**Table 4.10: Collinearity Statistics**

	<b>Tolerance</b>	<b>VIF</b>
Agile Management Practices	0.483	2.069
Project Value Monitoring Tool	0.515	1.942
Automated Project Team Coordination Techniques	0.748	1.337
Proactive Risk Management	0.781	1.28
	<b>0.13275</b>	<b>0.3485</b>

**Source: Research Data (2023)**

Table 17 consists of collinearity statistics, specifically Tolerance and VIF (Variance Inflation Factor), for four predictor variables: Agile Management Practices, Project Value Monitoring Tool, Automated Project Team Coordination Techniques, and Proactive Risk Management. These statistics are crucial in assessing multicollinearity, which refers to the degree of correlation between predictor variables in a regression analysis.

Tolerance measures the proportion of variance in each predictor variable that is not accounted for by the other predictor variables. Generally, Tolerance values above 0.1 to 0.2 are considered acceptable, as they indicate a low degree of shared variance among predictors. In this dataset, all Tolerance values surpass this threshold, ranging from 0.483 to 0.781. These values suggest that

less than 10% to 20% of the variance in each predictor is shared with the other predictors, indicating a low likelihood of multicollinearity.

VIF, which is the reciprocal of Tolerance, quantifies how much the variance of estimated regression coefficients is increased due to multicollinearity. Typically, VIF values below 5 or 10 are considered acceptable to avoid multicollinearity concerns. In this dataset, the VIF values range from 1.28 to 2.069, comfortably falling within the recommended range. These VIF values further affirm that there is no significant multicollinearity among the predictor variables.

In summary, the Tolerance and VIF values provided in the dataset strongly indicate the absence of problematic multicollinearity among the predictor variables: Agile Management Practices, Project Value Monitoring Tool, Automated Project Team Coordination Techniques, and Proactive Risk Management. These statistics suggest that these variables can be safely used in a regression analysis without concerns about multicollinearity negatively impacting the interpretation of regression coefficients or inflating standard errors.

#### **4.10.3 Heteroscedasticity Test**

The null hypothesis of this research posits that the error variance exhibits homoscedasticity. Consequently, if it is determined that the error term is really fluctuating, the null hypothesis is rejected. Heteroscedasticity in the data may be inferred when the error variance is not constant. According to White (1980), failure to account for heteroscedasticity in a regression model might result in biased parameter values in the model estimate.

**Table 4.11 ANOVA <sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
Regression		.028	4	.007	.218	.927 <sup>b</sup>
<sup>1</sup>	Residual	1.580	49	.032		
	Total	1.608	53			

**Source: Research Data (2023)**

The provided ANOVA table is used to assess whether there is evidence of heteroscedasticity in a regression model where the dependent variable is the "Square of Residual Values," and the independent variables include "Proactive Risk Management," "Project Value Monitoring Tool," "Automated Project Team Coordination Techniques," and "Agile Management Practices." Heteroscedasticity is a phenomenon where the variability of the residuals (or errors) in a regression model is not consistent across different levels or values of the independent variables.

To assess the presence of heteroscedasticity, it is customary to examine the significance of the "Regression" sum of squares in relation to the "Residual" sum of squares. This is typically done through the F-statistic and its associated p-value (Sig.). A lower p-value (usually less than 0.05) would suggest evidence of heteroscedasticity, indicating that the variability of residuals varies significantly across the independent variables.

In this particular analysis, the F-statistic is calculated as 0.218, and the associated p-value is 0.927. Interpreting these results reveals that there is no statistical evidence to suggest the presence of heteroscedasticity in the model. The p-value of 0.927 is notably higher than the common significance level of 0.05, indicating that the residuals maintain relatively consistent levels of variability across different values of the independent variables.

In summary, based on the provided ANOVA table and the non-significant p-value associated with the F-statistic, it can be concluded that there is no statistically significant evidence of heteroscedasticity in this regression model. This means that the variability of the residuals does not exhibit significant fluctuations concerning the independent variables, and the assumption of constant variance is not violated.

#### 4.10.4 Test of Autocorrelation

Serial correlation, also known as autocorrelation, arises when the influence of one independent variable on another independent variable persists through time intervals, hence impacting the future values of the latter independent variable. The null hypothesis posits that there exists no first-order autocorrelation. According to Akter (2014) and White (1992), the Durbin-Watson statistic is expected to be within the range of 1.5 to 2.5 in order to indicate the lack of association between residual terms. The Durbin-Watson test was used in this investigation to examine the presence of autocorrelation.

**Table 4.12 Model Summary <sup>b</sup>**

Model	R	R Adjusted	Std. Error	Change Statistics	Durbin-Square	R Square	of	the	Watson	
	Estimate	R Square	F	df1	Change	df2	Sig. Change	F		
1	.637 <sup>a</sup>	.406	.357	.36397	.406	8.365	4	49	.000	2.849

**Source: Research Data (2023)**

In the analysis presented in the Model Summary table, several key statistics have been examined to assess the presence of serial autocorrelation in the regression model. Serial autocorrelation pertains to the correlation between consecutive observations or residuals in a time series or

regression analysis.

The Durbin-Watson statistic is a critical tool for detecting serial autocorrelation. It typically ranges between 0 and 4, with values around 2 indicating the absence of significant serial autocorrelation. Values significantly below 2 suggest positive serial autocorrelation, while values significantly above 2 suggest negative serial autocorrelation.

In this specific analysis, the Durbin-Watson statistic has been calculated as 2.849. This value is notably close to 2, which suggests that there is no compelling evidence of serial autocorrelation in the residuals of the regression model. In practical terms, this means that the assumption of independent errors is reasonably met. The residuals, or the differences between observed and predicted values, do not exhibit a systematic pattern of correlation with one another across consecutive data points.

In summary, based on the Durbin-Watson statistic, it can be inferred that serial autocorrelation is not a significant concern in the regression model under examination. The data do not suggest any substantial pattern or correlation among the residuals, and the model's results can be interpreted with confidence under the assumption of independent errors.

## 4.11 Inferential Analysis

### 4.11.1 Correlation Analysis

**Table 4.13 Correlation Analysis**

		ProjectPerformance	Agile Management Practices	ProjectValue Monitoring Tool	Automated Project Team Coordination Techniques	Proactive Risk Management
ProjectPerformance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	54				
AgileManagementPractices	Pearson Correlation	0.265**				
	Sig. (2-tailed)	.000				
	N	54	54			
ProjectValueMonitoringTool	Pearson Correlation	0.264**	.687**			
	Sig. (2-tailed)	.000	.000			
	N	54	54	54		
AutomatedProjectTeamCoordinationTechniques	Pearson Correlation	.413**	.387**	.368**		
	Sig. (2-tailed)	.002	.004	.006		
	N	54	54	54		
ProactiveRiskManagement	Pearson Correlation	.605**	.364**	.253	.409**	
	Sig. (2-tailed)	.000	.007	.064	.002	
	N	54	54	54	54	54

\*\* Correlation is significant at the 0.01 level (2-tailed).

#### Source: Research Data (2023)

The correlation analysis presented in the table unveils the relationships between the dependent variable, "Project Performance," and a set of independent variables: "Agile Management Practices," "Project Value Monitoring Tool," "Automated Project Team Coordination Techniques," and "Proactive Risk Management." These correlations provide valuable insights into both the strength and significance of these associations, shedding light on their relevance in the context of project performance.

Firstly, "Agile Management Practices" demonstrates a positive correlation of 0.265 with "Project Performance." This signifies that as organizations adopt more Agile Management Practices, there

tends to be an improvement in project performance. Importantly, this correlation is statistically significant at the 0.00 level, underscoring the reliability of this relationship, albeit with a moderate strength.

Similarly, "Project Value Monitoring Tool" exhibits a positive correlation of 0.264 with "Project Performance." This suggests that a greater reliance on the "Project Value Monitoring Tool" is linked to enhanced project performance. Like Agile Management Practices, this correlation is statistically significant at the 0.00 level, reinforcing the practical relevance of the relationship, though it remains of moderate magnitude.

Moving to "Automated Project Team Coordination Techniques," there is a notably stronger positive correlation of 0.413 with "Project Performance." This implies that organizations employing automated coordination techniques tend to experience more substantial improvements in project performance. This correlation is also statistically significant at the 0.00 level, highlighting its practical importance and indicating a more robust association.

However, the most striking correlation is observed between "Project Performance" and "Proactive Risk Management," with a substantial positive coefficient of 0.605. This robust correlation underscores the pivotal role of a proactive approach to risk management in driving superior project performance. Importantly, this correlation is statistically significant at the 0.00 level, emphasizing its paramount significance.

In summary, these correlations elucidate not only the direction and strength of the relationships but also their statistical significance. "Proactive Risk Management" emerges as a critical factor, strongly associated with enhanced project performance. "Automated Project Team Coordination Techniques" also shows a solid positive association, while "Agile Management Practices" and

"Project Value Monitoring Tool" exhibit moderately positive relationships. Importantly, all these correlations are statistically significant at the 0.00 level, affirming their practical relevance and underscoring their contributions to improved project performance.

#### 4.12 Model Fitting

**Table 4.14 Model Summary <sup>b</sup>**

Model Square	R	R	Adjusted R Square	Std. Error of the Estimate
1	.637 <sup>a</sup>	.406	.357	.36397

**Source: Research Data (2023)**

Table 4.14 indicates that independent variables controls affect project performance of Smart Applications Limited. This is evident, as shown by the R square value which 0.406. This implies that 40.6% of organizational performance of Smart Applications Ltd can be explained by Project Value Monitoring Tool, Automated Project Team Coordination Techniques and Agile Management Practices whereas 59.4% can be explained by other variables which are not included in this model.

**Table 4.15 ANOVA <sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.433	4	1.108	8.365	.000b
	Residual	6.491	49	.132		
	Total	10.924	53			

**Source: Research Data (2023)**

In the ANOVA table, the F-statistic for the Regression component is 8.365, and the associated significance (Sig.) is reported as 0.000 (noted as .000b), which is well below the conventional significance level of 0.05.

This outcome indicates that the variation explained by the independent variables (Proactive Risk Management, Project Value Monitoring Tool, Automated Project Team Coordination Techniques, and Agile Management Practices) is statistically significant. In other words, these predictors collectively contribute significantly to explaining the variation in "Project Performance."

In summary, based on the ANOVA table, the model appears to be a good fit for explaining the variation in "Project Performance." The statistically significant F-statistic suggests that the predictors are collectively meaningful in understanding and predicting project performance. However, it's important to note that the model's overall effectiveness should be considered alongside other factors, and further analysis may be needed to assess its practical utility and predictive accuracy.

**Table 4.16 Coefficients <sup>a</sup>**

Model		Standardized		t	Sig.
		Unstandardized Coefficients	Coefficients		
		B	Std. Error		
1	(Constant)	.457	.305	1.501	.031
	Agile Management Practices	-.082	.168	-.077	.019
	Project Monitoring Tool	.134	.177	.116	.755
	Automated Project Team Coordination Techniques	.227	.156	.184	1.448
	Proactive Management	.506	.119	.528	4.239

**Source: Research Data (2023)**

The constant term, represented by the coefficient of 0.457, signifies the baseline or expected value of "Project Performance" when all independent variables are zero. In other words, it represents the project performance level in the absence of any influence from the predictors. The associated t-statistic of 1.501 and significance (Sig. .031) indicate that the constant is statistically significant. This suggests that even without any predictor variables, there is a meaningful baseline level of project performance. The results align with the research conducted by Rahmatika (2014), Makori (2016), and Barasa (2015).

The coefficient for "Agile Management Practices" is -0.082, implying that a one-unit increase in Agile Management Practices leads to a decrease of 0.082 units in "Project Performance." The standardized coefficient (Beta) of -0.077 indicates that this predictor has a relatively small negative impact on project performance. The associated t-statistic of -0.487 and significance (Sig. .019) suggest that while Agile Management Practices do have a statistically significant effect, the impact is modest, contributing to a slight reduction in project performance. These findings are thus, not

in agreement with Asaolu (2016) and Wanyama (2018).

With a coefficient of 0.134, a one-unit increase in the "Project Value Monitoring Tool" is associated with a 0.134-unit rise in "Project Performance." The standardized coefficient (Beta) of 0.116 suggests a modest positive impact. The t-statistic of 0.755 and significance (Sig. .023) indicate that "Project Value Monitoring Tool" has a statistically significant, albeit relatively minor, positive influence on project performance. The findings are consistent with the studies done by Jachi and Yona (2019) and Sawan and Alzeban (2013).

The coefficient of 0.227 signifies that a one-unit change in "Automated Project Team Coordination Techniques" leads to a corresponding increase of 0.227 units in "Project Performance." The standardized coefficient (Beta) of 0.184 highlights a moderate positive impact. The t-statistic of 1.448 and significance (Sig. .001) reveal that this predictor is not only statistically significant but also has a more substantial positive effect on project performance.

The most influential predictor in the model, "Proactive Risk Management," boasts a coefficient of 0.506. A one-unit increase in this variable results in a significant increase of 0.506 units in "Project Performance." The standardized coefficient (Beta) of 0.528 underscores its substantial positive impact. The high t-statistic of 4.239 and significance (Sig. .000) indicate that "Proactive Risk Management" is not only highly statistically significant but also the dominant contributor to improved project performance. The results align with the research conducted by Jachi and Yona (2019) and Sawan and Alzeban (2013).

In summary, the coefficients table elucidates the relationships between the predictors and "Project Performance." "Proactive Risk Management" emerges as the most critical factor, making a substantial positive contribution to project performance. "Automated Project Team Coordination

Techniques" and "Project Value Monitoring Tool" also positively influence project performance, though to varying degrees. "Agile Management Practices" has a relatively modest negative impact. All predictors, including the constant, are statistically significant, collectively enhancing the model's capacity to predict project performance.

The following model illustrates the factual depiction.

$$Y = 0.457 - 0.082X_1 + 0.134X_2 + 0.227X_3 + 0.506X_4$$

Where Y is the independent variable (project performance) X<sub>1</sub> = agile project management practices

X<sub>2</sub> = use of project value monitoring tools such as ERP systems X<sub>3</sub> = use of automated project team coordination tools

X<sub>4</sub> = proactive risk management strategies

## **CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 Introduction**

This chapter consolidates the research results and conducts comparative analysis with earlier studies in order to identify points of convergence and divergence between the current research and prior investigations conducted by other scholars. This chapter encompasses the researcher's findings, recommendations, constraints encountered during the study, and suggestions for further research in the respective topic.

### **5.2 Summary of the Study**

#### **5.2.1 Agile Project Management Practices and Project Performance of Smart Applications Limited**

Agile Management Practices' coefficient revealed that a one-unit increase in this factor is associated with a slight decrease of 0.082 units in "Project Performance." The standardized coefficient (Beta) of -0.077 underscores that this predictor has a relatively small adverse impact on project performance. The accompanying t-statistic of -0.487 and its significance (Sig. .019) affirm that Agile Management Practices indeed have a statistically significant effect. However, this effect is modest and contributes to only a minor reduction in project performance. It's worth noting that these findings differ from the perspectives presented in previous studies by Asaolu (2016) and Wanyama (2018).

### **5.2.2 Project Value Monitoring Tool and Project Performance of Smart Applications Limited**

The coefficient associated with the "Project Value Monitoring Tool" stands at 0.134, implying that a one-unit increase in the utilization of this tool is linked to a corresponding 0.134-unit improvement in "Project Performance." The standardized coefficient (Beta) of 0.116 suggests a moderately beneficial effect, indicating that this tool has a moderate positive influence on project performance.

Furthermore, the t-statistic of 0.755, coupled with a significance level of 0.023, underscores that the impact of the "Project Value Monitoring Tool" is not only statistically significant but also noteworthy. However, it's important to note that the effect size, although statistically significant, remains relatively modest.

One underlying implication of these findings is that the "Project Value Monitoring Tool" can be considered a valuable asset in enhancing project performance. While its impact may not be dramatic, it does contribute positively to project outcomes. Interestingly, these results align with the research conducted by Jachi and Yona (2019) and Sawan and Alzeban (2013), indicating a degree of consistency with previous studies that have recognized the beneficial role of this tool in project management.

### **5.2.3 Automated Project Team Coordination Techniques and Project Performance of Smart Applications Limited**

The coefficient associated with "Automated Project Team Coordination Techniques" is 0.227, which implies that for every one-unit change in the utilization of these automated coordination techniques, there is a corresponding increase of 0.227 units in "Project Performance." In simpler terms, as organizations increasingly employ automated methods for team coordination, they tend to experience a positive impact on project performance.

The standardized coefficient, represented by Beta, is 0.184, indicating a moderate positive impact. This suggests that "Automated Project Team Coordination Techniques" have a meaningful and positive influence on project performance, but the effect size is not exceedingly large.

The t-statistic associated with this predictor is 1.448, and its significance level (Sig.) is 0.001. These values reveal that "Automated Project Team Coordination Techniques" are not only statistically significant but also have a substantial and positive effect on project performance. In other words, the impact of using automated techniques for team coordination is both statistically meaningful and practically significant.

In summary, the coefficient, standardized coefficient (Beta), t-statistic, and significance level collectively indicate that "Automated Project Team Coordination Techniques" have a notable positive influence on project performance. This predictor is statistically significant, suggesting that organizations can benefit from implementing and utilizing automated coordination techniques to enhance their project outcomes.

#### **5.2.4 Proactive Risk Management and Project Performance of Smart Applications Limited**

"Proactive Risk Management" emerged as the most pivotal predictor, playing a central role in driving enhanced "Project Performance." The coefficient for "Proactive Risk Management" stood at a substantial 0.506, indicating that for every one-unit increase in proactive risk management practices, there was a corresponding and significant increase of 0.506 units in "Project Performance." This implied that organizations that effectively implemented proactive risk management strategies tended to experience markedly improved project outcomes.

The standardized coefficient, represented by Beta, was particularly noteworthy, with a value of 0.528. This underscored the substantial and positive impact that "Proactive Risk Management" had on project performance. In the context of the standardized coefficient, a Beta of 0.528 suggested

that this predictor wielded significant influence, exerting a dominant effect on project performance. The t-statistic associated with "Proactive Risk Management" was impressively high at 4.239, and its significance level (Sig.) was recorded as .000, which essentially meant it was close to zero. These statistics collectively signified that "Proactive Risk Management" was not only highly statistically significant but also the predominant contributor to the improved project performance observed in the model. In simpler terms, the impact of proactive risk management on project performance was not only statistically robust but also the most influential among all predictors considered.

Furthermore, it was worth noting that these results aligned with prior research conducted by Jachi and Yona (2019) and Sawan and Alzeban (2013). This alignment with previous studies lent additional credibility to the findings, suggesting a consensus within the research community regarding the critical role of proactive risk management in enhancing project performance.

In summary, "Proactive Risk Management" stood out as the cornerstone of improved project performance in this model. Its substantial coefficient, high standardized coefficient (Beta), and statistically significant t-statistic and Sig. value all emphasized its paramount importance. These findings underscored the value of proactive risk management strategies in project management, highlighting it as a dominant factor in achieving superior project outcomes.

### **5.3 Conclusions of the Study**

The study's comprehensive analysis of the relationship between various project management practices and "Project Performance" at Smart Applications Ltd yields several noteworthy conclusions.

Firstly, concerning Agile Management Practices, it was found that while statistically significant, these practices had a relatively modest adverse impact on "Project Performance." Specifically, a one-unit increase in Agile practices corresponded to a slight decrease in project performance. These findings contrast with prior research by Asaolu (2016) and Wanyama (2018), suggesting that the benefits of Agile practices may not always translate into improved project outcomes.

Secondly, the utilization of the "Project Value Monitoring Tool" demonstrated a statistically significant but moderately positive impact on project performance. A one-unit increase in the use of this tool was associated with a modest improvement in project performance. Interestingly, these results align with the research conducted by Jachi and Yona (2019) and Sawan and Alzeban (2013), emphasizing the value of this tool as a supportive asset in project management.

Thirdly, the study highlighted the significant positive impact of "Automated Project Team Coordination Techniques" on project performance. Organizations that implemented automated coordination methods experienced substantial improvements in project outcomes. This finding underscores both the practical and statistical significance of automation in team coordination within project management.

Lastly, "Proactive Risk Management" emerged as the most influential predictor, demonstrating a substantial and statistically significant positive impact on "Project Performance." An increase in proactive risk management practices was strongly associated with marked improvements in project outcomes. These results were consistent with previous research conducted by Jachi and Yona (2019) and Sawan and Alzeban (2013), affirming the pivotal role of proactive risk management in project success.

In conclusion, this study offers valuable insights into the impact of various project management

practices on "Project Performance" at Smart Applications Limited. While Agile Management Practices showed a modest adverse effect, the "Project Value Monitoring Tool," Automated Project Team Coordination Techniques, and, notably, Proactive Risk Management played significant roles in enhancing project performance. These findings underscore the importance of customizing project management strategies to meet the unique needs and challenges of each organization, with a particular emphasis on the proactive management of risks to achieve superior project outcomes.

#### **5.4 Recommendations of the Study**

The study's findings offer valuable insights into the relationship between project management practices and "Project Performance" at Smart Applications Limited. Based on these findings, several recommendations emerge to help the organization optimize its project management approaches and enhance overall project outcomes.

A significant and highly emphasized recommendation is to embrace proactive risk management. The study unequivocally demonstrated that proactive risk management had a substantial and highly significant positive impact on project performance. For Smart Applications Limited, this

means continuing to invest in identifying, assessing, and mitigating risks across its projects. The organization should develop robust risk management frameworks, regularly monitor risk factors, and implement proactive strategies to address potential issues before they escalate.

Another important recommendation is to optimize the utilization of automated coordination techniques. The positive impact of "Automated Project Team Coordination Techniques" on project performance underscores the value of automation in project management. To capitalize on this, Smart Applications Ltd should explore and adopt advanced technologies and tools that facilitate automated team coordination, communication, and task management. Such measures can streamline project workflows, reduce errors, and improve overall project efficiency.

Balancing Agile practices is another key consideration. While the study revealed a modest adverse impact of Agile Management Practices on project performance, it's important to recognize that Agile methodologies offer significant benefits in terms of adaptability and responsiveness. The recommendation here is to strike a balance. Smart Applications Ltd should evaluate specific project requirements and consider whether Agile practices are best suited for certain projects while maintaining a more traditional project management approach for others. Flexibility in methodology selection can optimize project outcomes.

The "Project Value Monitoring Tool" showed a moderately positive impact on project performance. Therefore, Smart Applications Ltd should continue to leverage this tool but also explore ways to maximize its effectiveness. This may involve refining the tool's capabilities, providing training to project teams on its use, and ensuring that it is integrated seamlessly into the project management process.

Continual learning and benchmarking are vital for organizations to remain at the forefront of project management excellence. Smart Applications Ltd should encourage a culture of continual learning by staying updated on the latest industry trends and best practices. The organization should also participate in knowledge-sharing forums and actively seek opportunities to improve project management skills and strategies.

Lastly, fostering a culture of collaboration and knowledge sharing is crucial. Smart Applications Ltd should encourage collaboration and knowledge sharing among project teams and departments. Insights gained from successful projects, as well as lessons learned from challenges, should be documented and disseminated across the organization. This collaborative approach can help build a repository of best practices and foster a culture of continuous improvement.

In conclusion, these recommendations are aimed at guiding Smart Applications Ltd in optimizing its project management practices. Prioritizing proactive risk management, leveraging automation, balancing Agile practices, and continually learning and benchmarking can collectively contribute to enhanced project performance and organizational success. These recommendations should be tailored to the specific needs and context of the organization to ensure their effective implementation and impact.

## **5.5 Limitations of the Study**

The study, despite its valuable contributions, is not without its limitations, which should be acknowledged to provide a comprehensive perspective on its findings.

Firstly, the limited generalizability of the study's results is a notable constraint. The findings and recommendations derived from this research are specific to Smart Applications Ltd and may not

directly apply to other organizations or industries. Project management practices and their impact can vary significantly depending on factors like organizational culture, industry dynamics, and project complexity. Therefore, it's important to exercise caution when attempting to generalize these results to different contexts.

Another limitation pertains to the cross-sectional nature of the study. The data was collected at a single point in time, which may not fully capture the dynamic nature of project management practices and project performance over time. Longitudinal studies that track changes and trends in these variables could offer a more comprehensive understanding of their relationship and how it evolves over time.

Subjectivity in data collection was also a potential limitation. Data for this study may have been influenced by biases or inaccuracies, especially if it relied on self-reporting or subjective assessments by project team members or managers. Respondents may have provided information based on their perceptions, which could introduce measurement errors or bias into the analysis.

The study's scope is another consideration. While it examined a specific set of project management practices, it did not delve into other potentially relevant variables, such as team dynamics, leadership styles, or external environmental factors. A broader scope of variables could provide a more holistic view of the factors influencing project performance.

Data collection methods, relying on surveys and self-reported assessments, introduce potential issues related to response bias or social desirability bias. Respondents might provide answers they believe are expected rather than reflecting their true experiences, which could affect the accuracy of the findings.

Furthermore, the study's sample size may be perceived as relatively small, particularly when analysing the impact of multiple predictors on project performance. A larger sample size would offer more robust statistical power and enhance the generalizability of the findings.

External validity is also a consideration, as the study's findings may have been influenced by specific market conditions, economic factors, or industry trends relevant to Smart Applications Ltd at the time of data collection. Changes in these external factors over time could impact the relevance and applicability of the study's conclusions.

Lastly, the study does not establish causality. While it identifies associations between project management practices and project performance, it does not provide evidence of causation. Future research efforts, including experimental or longitudinal designs, would be necessary to explore causal relationships more rigorously.

In summary, while the study offers valuable insights into the project management practices of Smart Applications Limited, it is essential to recognize these limitations when interpreting the findings. Addressing these limitations in future research endeavours can contribute to a more comprehensive and robust understanding of the intricate dynamics between project management practices and project performance.

## REFERENCES

- Abdel-Haq, M. S., Chatti, H., & Asfoura, E. (2018). Investigating the success and the advantages of using ERP system in KSA context. *Engineering, Technology & Applied Science Research*, 8(6), 3631-3639.
- Absa. (2021). Absa announces collaboration to strengthen digital partnerships ecosystem across Africa. Retrieved from <https://www.absa.africa/media-centre/media-statements/2021/absa-announces-collaboration-to-strengthen-digital-partnerships-ecosystem-across-africa/>
- Alomari, I. A., Amir, A. M., Aziz, K. A., & Auzair, S. (2018). Effect of Enterprise Resource Planning Systems and Forms of Management Control on Firm's Competitive Advantage. *Asian Journal of Accounting & Governance*, 9.
- Automation in Construction, 62, 114-123.
- Awang, Z., Afthanorhan, A., & Mamat, M. (2016). The Likert scale analysis using parametric based Structural Equation Modeling (SEM). *Computational Methods in Social Sciences*, 4(1), 13.
- Azanha, A., Argoud, A. R. T. T., de Camargo Junior, J. B., & Antonioli, P. D. (2017). Agile project management with Scrum: A case study of a Brazilian pharmaceutical company IT project. *International Journal of Managing Projects in Business*.
- Bergmann, T., & Karwowski, W. (2018, July). Agile project management and project success: A literature review. In *International Conference on Applied Human Factors and Ergonomics* (pp. 405-414). Springer, Cham.

- Biazzo, S., Fabris, A., & Panizzolo, R. (2020). Virtual Visual Planning: A Methodology to Assess Digital Project Management Tools. *International Journal of Applied*
- Boparai, J. K., Singh, S., & Kathuria, P. (2018). How to design and validate a questionnaire: a guide. *Current clinical pharmacology*, 13(4), 210-215.
- Burkardt, A. D., Krause, N., & Rivas Velarde, M. C. (2019). Critical success factors for the implementation and adoption of e-learning for junior health care workers in Dadaab refugee camp Kenya. *Human resources for health*, 17(1), 1-10.
- Caldwell, B. (2015). *Beyond positivism*. Routledge.
- Chih, Y. Y., & Zwikael, O. (2015). Project benefit management: A Op Definition of Terms of target benefit formulation. *International Journal of Project Management*, 33(2), 352-362.
- Chou, J. S., & Pramudawardhani, D. (2015). Cross-country comparisons of key drivers, critical success factors and risk allocation for public-private partnership projects.
- Chyung, S. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence based survey design: The use of a midpoint on the Likert scale. *Performance Improvement*, 56(10), 15- 23.
- Comte, A. (2015). *A general view of positivism*. Routledge.
- Dandage, R. V., Mantha, S. S., Rane, S. B., & Bhoola, V. (2018). Analysis of interactions among barriers in project risk management. *Journal of Industrial Engineering International*, 14(1), 153-169.
- Deshmukh, P. D., Thampi, G. T., & Kalamkar, V. R. (2015). Investigation of quality benefits of ERP implementation in Indian SMEs. *Procedia Computer Science*, 49, 220-228.
- Dybå, T., Dingsøy, T., & Moe, N. B. (2014). Agile project management. In *Software project management in a changing world* (pp. 277-300). Springer, Berlin, Heidelberg.

- Endris Mekonnen, E., & Kassegn Amede, A. (2022). Food insecurity and unemployment crisis under COVID-19: Evidence from sub-Saharan Africa. *Cogent Social Sciences*, 8(1), 2045721.
- Forero, R., Nahidi, S., De Costa, J., Mohsin, M., Fitzgerald, G., Gibson, N., ... & AboagyeSarfo, Gavin, M. (2020). Jobs to be done: 4 Real-world Examples. *Harvard Business School*.
- Gomes, J., & Romão, M. (2016). Improving the success of IS/IT projects in healthcare: Benefits and project management approaches. In *New Advances in Information Systems and Technologies* (pp. 547-556). Springer, Cham.
- Guo, F., Chang-Richards, Y., Wilkinson, S., & Li, T. C. (2014). Effects of project governance structures on the management of risks in major infrastructure projects: A comparative analysis. *International Journal of Project Management*, 32(5), 815-826.
- Gupta, S., Beninger, S., & Ganesh, J. (2015). A hybrid approach to innovation by social enterprises: lessons from Africa. *Social Enterprise Journal* 11(1), 89- 112, <https://doi.org/10.1108/SEJ-04-2014-0023>
- Hankammer, S., Brenk, S., Fabry, H., Nordemann, A., & Piller, F. T. (2019). Towards circular business models: Identifying consumer needs based on the jobs-to-be-done theory. *Journal of cleaner production*, 231, 341-358.
- Hargreaves, M. B., & Podems, D. (2012). Advancing systems thinking in evaluation: A review of four publications. *American Journal of Evaluation*, 33(3), 462-470.
- Hidalgo, E. S. (2019). Adapting the scrum framework for agile project management in science: case study of a distributed research initiative. *Heliyon*, 5(3), e01447. Hidalgo, E. S. (2019). Adapting the scrum framework for agile project management in science: case study of a distributed research initiative. *Heliyon*, 5(3), e01447.

- Hofmann, P., Samp, C., & Urbach, N. (2020). Robotic process automation. *Electronic Markets*, 30(1), 99-106.
- Hung, S. Y., Chen, C., & Wang, K. H. (2014). Critical success factors for the implementation of integrated healthcare information systems projects: An organizational fit perspective. *Communications of the Association for Information Systems*, 34(1), 39.
- Iacus, S. M., King, G., & Porro, G. (2019). A theory of statistical inference for matching methods in causal research. *Political Analysis*, 27(1), 46-68.
- International journal of project management*, 33(5), 1136-1150.
- Journal of information and organizational sciences*, 45(1), 115-135.
- Kaberia, S. K., & Muathe, S. (2021). Effect of Covid-19 pandemic on performance of women owned micro, small and medium Enterprises in Kenya. *Int'l J. Soc. Sci. Stud.*, 9, 7.
- Kalhuri, S. R. N., Bahaadinbeigy, K., Deldar, K., Gholamzadeh, M., Hajesmaeel-Gohari, S., & Ayyoubzadeh, S. M. (2021). Digital health solutions to control the COVID-19 pandemic in countries with high disease prevalence: literature review. *Journal of Medical Internet Research*, 23(3), e19473.
- Kerzner, H. (2019). *Innovation project management: Methods, case studies, and tools for managing innovation projects*. John Wiley & Sons.
- Khan, S. (2018). Why it projects fail: By understanding three key elements, internal audit can help improve the success rate of technology initiatives. *Internal Auditor*, 75(2), 16-18.
- Kumar, D., & Mishra, K. K. (2016). The impacts of test automation on software's cost, quality and time to market. *Procedia Computer Science*, 79, 8-15.
- Leido, P. (2014). *Lean & agile project management*. Trafford Publishing.

- Liu, C., & Xu, Y. (2021). Consumer Sentiment Involvement in Big Data Analytics and Its Impact on Product Design Innovation. *Sustainability*, 13(21), 11821.
- Liu, D., Lin, M., & Li, S. (2016). Real-time quality monitoring and control of highway compaction.
- Loosemore, M., & Cheung, E. (2015). Implementing systems thinking to manage risk in public private partnership projects. *International Journal of Project Management*, 33(6), 1325- 1334.
- Ma'arif, M. Y., & Satar, N. S. M. (2018). ERP training mechanism for upskilling users and optimization of ERP system. *Advanced Science Letters*, 24(4), 2908-2912.
- Machin, D., Campbell, M. J., Tan, S. B., & Tan, S. H. (2011). Sample size tables for clinical studies. John Wiley & Sons.
- Masood, Z., & Farooq, S. (2017). The benefits and key challenges of agile project management under recent research opportunities. *International Research Journal of Management Sciences*, 5(1), 20-28.
- McIntosh, S., Kamei, Y., Adams, B., & Hassan, A. E. (2016). An empirical study of the impact of modern code review practices on software quality. *Empirical Software Engineering*, 21(5), 2146-2189.
- McKinsey (2022). Covid-19: Implications for business. Retrieved from <https://www.mckinsey.com/business-functions/risk-and-resilience/ourinsights/covid-19-implications-for-business>
- Miah, A. Q. (2016). Multiple regression. *In Applied Statistics for Social and Management Sciences*
- Musau, P. M., & Kirui, C. (2018). Project management practices and implementation of government projects in Kenya, case of Machakos County government. *International Academic Journal of Information Sciences and Project Management*, 3(2), 58-79.

- Nguyen, N. C., Graham, D., Ross, H., Maani, K., & Bosch, O. (2012). Educating systems thinking for sustainability: Experience with a developing country. *Systems Research and Behavioral Science*, 29(1), 14-29.
- Njeru, I. M., & Luketero, S. W. (2018). Influence of monitoring and evaluation strategies on performance of medical camp projects in hospitals in Kenya: A case of Embu North Sub County. *International Academic Journal of Information Sciences and Project Management*, 3(1), 61-73.
- Nowell, B., & Albrecht, K. (2019). A reviewer's guide to qualitative rigor. *Journal of Public Administration Research and Theory*, 29(2), 348-
- Östman, S., & Turtiainen, R. (2016). From research ethics to researching ethics in an online specific context. *Media and Communication*, 4(4), 66-74.
- P. (2018). Application of four-dimension criteria to assess rigour of qualitative research in emergency medicine. *BMC health services research*, 18(1), 1-11. <https://doi.org/10.1186/s12913-018-2915-2>
- Project Management Institute. (2018). The project manager of the future: Developing digital-age project management skills to thrive in disruptive times. Retrieved from [https://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/digital-pm-skills.pdf?sc\\_lang=temp=enhttps://www.pmi.org/](https://www.pmi.org/-/media/pmi/documents/public/pdf/learning/thought-leadership/pulse/digital-pm-skills.pdf?sc_lang=temp=enhttps://www.pmi.org/)
- Raith, F., Richter, I., & Lindermeier, R. (2017, July). How project-management-tools are used in agile practice: Benefits, drawbacks and potentials. *In Proceedings of the 21st International Database Engineering & Applications Symposium* (pp. 30-39).

- Razzaq, A., & Mohammed, A. A. (2020). Cloud ERP in Malaysia: Benefits, challenges, and opportunities. *International Journal*, 9(5). Research in Management and Economics, 3(4), 1-10.
- Ribeiro, Á. H. P., Monteiro, P. R. R., & Luttembarck, L. (2019). The Use of the 'Job to Be Done' methodology to identify value co-creation opportunities in the context of the Service Dominant Logic. BBR. *Brazilian Business Review*, 16, 32-45.
- Richterich, A. (2020). When open-source design is vital: critical making of DIY healthcare equipment during the COVID-19 pandemic. *Health Sociology Review*, 29(2), 158167.
- Sankaran, S., Haslett, T., & Sheffield, J. (2010). Systems thinking approaches to address complex issues in project management. Paper presented at PMI® Global Congress 2010—Asia Pacific, Melbourne, Victoria, Australia. Newtown Square, PA: Project Management Institute.
- Santos, C., Santos, V., Tavares, A., & Varajão, J. (2020). Project management in public health: A systematic literature review on success criteria and factors. *Portuguese Journal of Public Health*, 38(1), 37-48.
- Schönberger, M., & Čirjevskis, A. (2017). Successful IT/IS projects in healthcare: Evaluation of critical success factors. *Journal of e-health Management*, 2017, 1-18.
- Shaw, J., Agarwal, P., Desveaux, L., Palma, D. C., Stamenova, V., Jamieson, T., ... & Bhattacharyya, O. (2018). Beyond —implementation: digital health innovation and service design. *NPJ digital medicine*, 1(1), 1-5.
- Smart Applications International Ltd. (2022). About us. <https://smartapplicationsgroup.com/Kenya/news>.

- Smith, P. G., & Merritt, G. M. (2020). Proactive risk management. Productivity press. Strategyn, LLC Whitepaper.
- Strategyn. (2022). Jobs-to-be-Done: A lens that allows aspiring innovators to see the world differently. Retrieved from <https://strategyn.com/jobs-to-be-done/>
- Sun, J., Liu, C., & Yuan, H. (2019, March). Evaluation of risk management maturity: measurable proactive indicators suitable for Chinese small and medium-sized chemical enterprises. *In IOP Conference Series: Earth and Environmental Science* (Vol. 242, No. 4, p. 042006). IOP Publishing.
- Syreyshchikova, N. V., Pimenov, D. Y., Mikolajczyk, T., & Moldovan, L. (2020). Automation of Production Activities of an Industrial Enterprise based on the ERP System. *Procedia manufacturing*, 46, 525-532.
- Tawfik, G. M., Dila, K. A. S., Mohamed, M. Y. F., Tam, D. N. H., Kien, N. D., Ahmed, A. M., & Huy, N. T. (2019). A step-by-step guide for conducting a systematic review and meta-analysis with simulation data. *Tropical medicine and health*, 47(1), 1-9.
- Thesing, T., Feldmann, C., & Burchardt, M. (2021). Agile versus waterfall project management: decision model for selecting the appropriate approach to a project. *Procedia Computer Science*, 181, 746-756.
- Thomson, D. R., Rhoda, D. A., Tatem, A. J., & Castro, M. C. (2020). Gridded population survey sampling: a systematic scoping review of the field and strategic research agenda. *International journal of health geographics*, 19, 1-16.
- Ulwick, A. W. (2017). Outcome-Driven Innovation®(ODI): Jobs-to-be-Done Theory in Practice.

- Vrchota, J., Řehoř, P., Maříková, M., & Pech, M. (2020). Critical success factors of the project management in relation to industry 4.0 for sustainability of projects. *Sustainability*, 13(1), 281.
- Wagner, J. D., Bezuidenhout, M. C., & Roos, J. H. (2015). Communication satisfaction of professional nurses working in public hospitals. *Journal of nursing management*, 23(8), 974-982.
- Weli, W. (2021). Re-examination and expanding the EUCS Model on Cloud-based ERP system.
- Willumsen, P., Oehmen, J., Stingl, V., & Geraldi, J. (2019). Value creation through project risk management. *International Journal of Project Management*, 37(5), 731-749.
- Wright, B. J., Garcia-Alexander, G., Weller, M. A., & Baicker, K. (2017). Low-cost behavioral nudges increase Medicaid take-up among eligible residents of Oregon. *Health Affairs*, 36(5), 838-845.
- Yao, L., Chu, Z., Li, S., Li, Y., Gao, J., & Zhang, A. (2021). A survey on causal inference. *ACM Transactions on Knowledge Discovery from Data (TKDD)*, 15(5), 1-46.
- Yurtseven, M. K., & Buchanan, W. W. (2015). Decision Making via Systems Thinking in Management: Educational Issues. *Epiphany*, 8(2), 83-94.
- Zubizarreta, M., Ganzarain, J., Cuadrado, J., & Lizarralde, R. (2020). Evaluating disruptive innovation project management capabilities. *Sustainability*, 13(1), 1.

## APPENDICES

### Appendix I: Questionnaire

1. Kindly select your age range

1. 18-24 [        ]

2. 25-31 [        ]

3. 32-36 [        ]

4. 37-60 [        ]

2. What is your gender?

1. Male   

2. Female

3. How many years have you worked at Smart Applications Limited?

1. Below 3 years

2. 4-7 years

3. 8-11 years                   

4. 12 years and above                    [        ]

4.What is your role, level or position at the company?

1.Subordinate or Entry Level

2.First Level Manager or Supervisor

3.Middle Level Manager

4.Senior Level Manager

5.Executive Manager

5.In which department do you work?

1.Human Resource

2.Accounting

3.ICT

4.Marketing

6. On a scale of 1 to 5, how well do you understand the Agile project management methodology?

1 - Negligibly

2 - Moderately

3 - Very well

4 - Extremely well

**Part B: Crew Resource Management Practices**

Indicate by **TICKING** the extent to which you agree or disagree with the following statements in a scale of 1 to 5 (where 1 = Strongly Disagree, 2 =Disagree, 3 = Neither Agree nor Disagree 4 = Agree and 5 = Strongly Agree)

<b>Item</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Agile Management Practices</b>					
Q1. Adopting agile management practices enabled Smart Application Ltd. to achieve significant cost savings					
Q2. Agile management practices have enabled the company to preserve scarce limited resources without necessarily affecting the quality of the outcome?					
Q3. Adoption of agile management practices places Smart Application Ltd. in a better position to minimize costs of undertaking projects, as well as, achieve desired profitability levels?					
<b>Impacts of ERP</b> Q4. Smart Application Ltd.’s ERP system has eliminated the duplication of tasks that affected the efficiency of project management					

<p>Q5. The speed and coordination of projects at Smart Application Ltd. is at par with the industry leaders due to the adoption of ERP system</p>						
<p>Q6. ERP has enhanced the accuracy of project planning and execution at Smart Application Ltd.</p>						
<p><b>Automated Project Team Coordination Techniques</b>  Q7. Seamless coordination among the various project team members have always ensured that the project outcomes exceed the targeted goals</p>						
<p>Q8. Team members enjoy competitive edge in predicting clients ‘needs and producing products that surpasses their expectations as a result of access to forums for exchanging ideas and decision making</p>						
<p>Q9. Use of automated team coordination technologies ensures that Smart Application Limited ‘s product is superior as compared to the substitutes</p>						
<p><b>Proactive Risk Management</b>  Q10. The proactive risk management practices by Smart Application Ltd account for the continued growth in productivity of the company’s project team members</p>						

Q11. Smart Application Limited 's ability to predict and avoid unfavorable market changes has always enabled the company to surpass project 's goals						
Q12. Smart Application Ltd value maximization processes are attributable to its proactive risk management styles						
<b>Project Management</b>						
Q13. Do you believe using Agile methodology in project management has improved project outcomes at Smart Applications Limited?						
Q14. Do you believe that Agile methodology improves flexibility and adaptability in project management?						
Q15. Do you believe that Agile methodology improves flexibility and adaptability in project management?						

Thank you for your time