FACTORS AFFECTING ADOPTION OF E-GOVERNMENT PROJECT MANAGEMENT SYSTEM BY CONTRACTORS IN NAIROBI

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AN APPLIED RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF BUSINESS ADMINISTRATION DEGREE OF AFRICA NAZARENE UNIVERSITY

APRIL, 2024

DECLARATION

DECLARATION

Declaration by the Candidate

I declare that this applied research project is my original work and that it has not been presented in any other university for academic credit.

Signature:..... **Date:** 19/06/2024.

Moses Ng'ong'a

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Declaration by Supervisors

This applied research project is submitted for examination with my approval as the university supervisor.

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To my father Remjius Ng'ong'a and my late mother Mercilina Ng'ong'a and the entire family of Ng'ong'a, for their support and encouragement throughout the course of my studies.

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ABSTRACT

The purpose of this study was therefore to establish the effects of extrinsic factors on adoption of e-government project management system by contractors, A Case of National Construction Authority (NCA), Nairobi Kenya. The study addressed problems witnessed in the construction industry, non-compliance, quacks working in the construction industry and provide an enabling environment for construction industry. The study had four objectives, to find the effects of perceived ease of use and adoption, the effects of perceived usefulness and adoption, the effect of social norm on adoption and the effect of facilitation condition on adoption. The theories supporting the study were reviewed and the theory supporting the study was unified theory of user acceptance and use of technology. The target population for the study was contractors in category 4. The sample that was used for the study was 281 selected from a population of 945 contractors. Data collection instruments for the study was self-administered questionnaires. The data collection instrument tested before being used in the collection of data. The data was screened, coded and analysed. The results indicated that perceived ease of use had positive and significant effect (p-value of 0.000) on adoption of e-government Project Management Systems. Perceived usefulness had a p-value of 0.000 which meant it had a positive and significant effect on adoption of e-government Project Management Systems. Social norms had a p-value of 0.000 which resulted to positive and significant effect on adoption of e-government Project Management Systems. Facilitating conditions had a p-value of 0.000 which implied it had a positive and significant effect on adoption of e-government Project Management Systems. On the other hand, the regression analysis revealed that the extrinsic factors explained up to 70.3% change in adoption of e-government Project Management Systems. The study concluded that extrinsic factors significantly influence adoption of e-government Project Management Systems by Contractors in Nairobi County. The study recommended that there is need of prioritizing user training to enhance skills and understanding, incorporating user-friendly features to simplify interactions, and providing continuous support to address varied experiences and perceptions of system complexity. Based on the study's findings, recommendations for optimizing the adoption of e-government Project Management Systems (e-GPMS) by contractors in Nairobi County should involve emphasizing and promoting the tangible benefits and positive impacts of the system on productivity, task efficiency, and overall professional effectiveness within the construction industry.

TABLE OF CONTENTS

DECLARATION.....**i**

DEDICATION.....Error! Bookmark not defined.

ACKNOWLEDGEMENT..... **iii**

ABSTRACT.....**iv**

TABLE OF CONTENTS .....**v**

LIST OF TABLES ..... **viii**

LIST OF FIGURES .....**ix**

LIST OF ABBREVIATIONS .....**x**

OPERATIONAL DEFINITION OF TERMS.....**xi**

CHAPTER ONE **1**

INTRODUCTION AND BACKGROUND OF STUDY **1**

1.1 Introduction.....1
1.2 Background of the Study 1
1.2.1 Adoption of E-Government Project Management System 2
1.2.2 Overview of Global, Regional and Kenya Perspective of e-government Project Management System.....2
1.3 Purpose of the Study 6
1.4 Statement of the Problem.....6
1.5 Objectives 8
1.5.1General Objective 8
1.5.2 Specific Objectives 8
1.6 Hypotheses.....8
1.7 Significance of the Study 9
1.8 Scope of the Study 10
1.9 Limitation of the Study 10
1.10 Delimitation of the Study.....11
1.11 Assumption of the Study.....11
1.12 Theoretical Framework.....12
1.13 Conceptual Framework.....15

CHAPTER TWO **18**

LITERATURE REVIEW **18**

2.1Introduction.....18
2.2 Empirical Studies.....18
2.2.1 The Perceived Ease of Use and Adoption of E-government Systems 18
2.2.2 The Perceived Usefulness and Adoption of E-government Systems.....21
2.2.3 The Facilitating Conditions and Adoption of E-government Systems ...25
2.2.4 The Social Norm and Adoption of E-government Systems.....30

CHAPTER THREE 38

RESEARCH DESIGN AND METHODOLOGY 38

3.1Introduction 38
3.2 Research Site 38
3.3 Target Population 38
3.4 Study Sample and Sampling Technique 39
3.4.1 Sampling Techniques and Procedure 39
3.4.2 Sample Size Determination 39
3.5 Research Instrument 40
3.5.1 Data Collection Instruments 40
3.5.2 Pilot Study 41
3.5.3 Validity of Data 41
3.5.4 Reliability of Data 42
3.5.5 Piloting for Validity and Reliability of research instruments 42
3.5.5 Data Collection Procedures 44
3.6 Data Analysis 45
3.6.1 Multiple regression analysis 46
3.6.2. Multiple regression model assumptions 46
3.7 Ethical Considerations 47

CHAPTER FOUR 48

RESEARCH FINDINGS AND DISCUSSIONS 48

4.1 Introduction 48
4.2 Response Rate 48
4.4 Demographic Characteristics 49
4.4.1 Age of the Respondents 49
4.4.1 Distribution of Respondents by Gender 50
4.4.2 Distribution of Respondents by Nationality 51
4.4.3 Respondents Duration Using ICT 52
4.5 Descriptive Statistics 53
4.5.1 Perceived Ease of Use 53
4.5.2 Perceived Usefulness 56
4.5.3 Social Norm 59
4.5.4 Facilitating Conditions 62
4.5.5 Adoption of e-government Project Management Systems by Contractors in Nairobi County 65
4.6 Inferential Statistics 68
4.6.1 Testing of Regression Model Assumptions 68
4.6.2 Linear Regression Results 72
4.6.3 Multiple Regression Analysis 80
4.6.4 Testing Hypotheses 85

CHAPTER FIVE 87

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS 87

5.1 Introduction....87
5.2 Discussion of Findings....87
5.3 Summary of the Major Findings....95
5.3.1 Influence of Perceived ease of use on Adoption of e-government Project Managements Systems....95
5.3.2 Influence of Perceived usefulness on Adoption of e-government Project Managements Systems....97
5.3.3 Influence of Social norm on Adoption of e-government Project Managements Systems....98
5.3.4 Influence of Facilitating conditions on Adoption of e-government Project Management Systems by Contractors in Nairobi County....99
5.4 Conclusions....101
5.5 Recommendations....102
5.6 Areas for Further Research....103

REFERENCES....104

APPENDICES....111

Appendix I: Introduction Letter....111
Appendix II: Questionnaire....112
Appendix III: NACOSTI Permit....117
Appendix IV: Estimated Research Budget....119
Appendix V: Research Work Plan....120

LIST OF TABLES

Table 1. 1: Contributing Theories and Core Constructs 15
Table 3. 1: Targeted Population 39
Table 3. 2: Sample Size 40
Table 4. 1: Reliability Test 43
Table 4. 2: Age of the Respondents 49
Table 4. 3: Distribution of Respondents by Gender 50
Table 4. 4: Education Level 51
Table 4. 6: Perceived ease of use 53
Table 4. 7: Perceived usefulness 57
Table 4. 8: Social norm 60
Table 4. 9: Facilitating conditions 63
Table 4. 10: Adoption of e-government Project Managements Systems 66
Table 4. 11: Multicollinearity Test 69
Table 4. 12: Pearson Correlation Analysis 71
Table 4.13: Regression Results of Perceived ease of use and Adoption of e-government Project Managements Systems 73
Table 4.14: Regression Results of Perceived usefulness and Adoption of e-government Project Management Systems by Contractors 75
Table 4.15: Regression Results of Social norm and Adoption of e-government Project Management Systems by Contractors in Nairobi County 77
Table 4.16: Regression Results of Facilitating conditions and Adoption of e-government Project Managements Systems 79
Table 4. 17: Model Summary 81
Table 4. 18: Model of Fit (ANOVA Table) 81
Table 4. 19: Regression Coefficients 83

LIST OF FIGURES

Figure 1.1: Conceptual Framework 16

Figure 4.1: Duration Using ICT 52

Figure 4.2: Normality Distribution 70

LIST OF ABBREVIATIONS

BI	**:**	Behaviour Intentions
BU	**:**	Behaviour Usage (Adoption)
FC	**:**	Facilitating Conditions
ICT	:	Information Communication Technology
ICU	:	Intention to Continue Using
IF-MIS	:	Integrated Finance Management Information System
IS	:	Information Systems
IT	:	Information Technology
NCA	:	National Construction Authority
PE0U	:	Perceived Ease of Use
PU	**:**	Perceived Usefulness
SCT	:	Social Cognitive Theory
SN	:	Social Norm
TAM	:	Technology Acceptance Model
TPB	:	Theory of Planned Behaviour
TRA	:	Theory of Reason and Action
UTAUT	:	Unified Theory of Acceptance and Use of Technology

OPERATIONAL DEFINITION OF TERMS

Adoption (Behaviour usage): refers to the extent to which citizens, government agencies, and other stakeholders embrace and use electronic or digital technologies and platforms to interact with and use in government processes.

Perceived Ease of Use: refers to the degree to which an individual believes that using electronic government services will be free of effort.

Facilitating Conditions: refer to the various enabling factors and circumstances that support the successful implementation and operation of electronic government initiatives.

Perceived Usefulness: refers to the subjective assessment of how valuable and beneficial individuals perceive a government's electronic services or systems to be in helping them accomplish their tasks, access information, or interact with government agencies.

Social Norms: refer to the unwritten rules, expectations, and shared behaviors that guide the interactions and behaviors of individuals, communities, and institutions in the digital realm.

Extrinsic factors refer to external influences and elements that can impact or shape the success and functioning e-government initiatives.

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF STUDY

1.1 Introduction

This section presents a synopsis to the study which include; background to the study, purpose of the study, statement of the problem, general and specific objectives, research hypothesis, the significance of the study, scope of the study, the assumption of the study, limitations of the study, delimitations of the study and the conceptual framework that will guide the study. This chapter gives an insight to the research area in the e-government project management system and adoption by contractors in National Construction Authority (NCA).

1.2 Background of the Study

The current world is characterized by turbulence and rapid changes as a result of information and communication technologies (ICTs) making most countries to shift from the old ways of running economies and industries to digitalization and computerization (Muoki, 2022). The introduction and advancement of ICT in government processes and procedures has enabled rationalization to be realized in the public sector (Oyuga, Gwaya & Njuguna, 2023). Progressively, the use of ICT has led to transformational changes in public policies, processes, as well as functions. The development of ICT could be viewed as an indicator of an innovative and informative economy; investors are likely to invest in an economy that is more technologically advanced since that environment creates business opportunities and increases efficiency, productivity and growth (Otido & Omwenga, 2019). The public could easily adopt to the e-governance or electronic governance technologies especially in regards

to service evaluation, if customer or citizen satisfaction and impressions of its service quality and impacts are emphasized (Verkijika & De Wet, 2018).

1.2.1 Adoption of E-Government Project Management System

ICT has changed the ways and means by which governments are transacting the social contract to improve service delivery in terms of public efficiency, effectiveness, transparency and accountability and reduction of costs and wastage in their functions and operations (Soong, Ahmed & Tan, 2020). E-governance is therefore, considered the lever for change and transformation of governments (Zaman, 2020). The introduction of e-governance has made it possible for citizens to access government services at a faster rate leading to improved service delivery and employee performance (Bamufleh *et al.,* 2021). Most governments have initiated e-governance programs with focus to deliver services and avail information to the people, notwithstanding the fact that service delivery platforms have continued to be disconnected across several public organizations. According to Elmansori and Ishak (2021), the attention on service delivery has become intertwined with attainment of cost saving measures, enhanced efficiency and effectiveness and therefore, governments are analyzing, synthesizing ICT implementation as a tool for service delivery to facilitate effective inter-organizational linkages and improve governance systems.

1.2.2 Overview of Global, Regional and Kenya Perspective of e-government Project Management System

Best practices on e-governance in the United States proves that successful large scale electronic information implementation is possible, with the best example being the digitalization and application of scientific and technical transactions in the Department

of Energy to collect, organize, archive, disseminate, and apply information so collected in research and development (Mensah, 2020). According to the European Union (EU) e-Government Report 2023, the application of e-governance in Europe has tremendously increased with the online access to public services standing at 81% within the European Union (EU) economic region.

The Government of the people's Republic of China deliberately embarked on expanding use of e-governance in 2001 to improve individual, team and Adoption of e-government Project Managements Systems with the intention of promoting socio-economic change and development (Li & Xue, 2021). It was important to note that the country started implementing programs that could facilitate e-governance even before its global networks were fully connected (Li & Shang, 2020) primarily to offer public services on the internet as either government to citizen (G2C) through online forums or government to government (G2G) through intranet.

Africa has also made significant gains in developing similar electronic governance platforms (Mohammad *et al.,* 2020). E-governance was forced down the throat of African states under the banner of New Public Management (NPM) by the western world as part of austerity measures to improve governance in developing nations. In Sub Saharan Africa, e-governance was therefore introduced to open up the democratic space, promote popular participation and investments in ICT related ventures (Park & Lee, 2018). However, lack of accountability and transparency is still a common occurrence in most African countries leading to corruption (Sukma & Leelasantitham, 2022). Government services are also still paper based hence increasing the frequency of human interaction (Twizeyimana, Larsson & Grönlund, 2018), despite the

introduction of ICT in government operations. This calls into question the role of ICT in government operations in the sub-Saharan Africa and therefore, the need for this study.

According to Information Communication Technology Kenya Master plan of 2021, Government of Kenya has introduced technology in a number of sectors to improve on service delivery and address compliance, for instance in the collection of revenue, itax has been introduced by the government, government has attempted to introduced cash less payment system through e-citizen platform, in the public procurement, the government has introduced the Integrated Financial Management Information System (IFMIS) payment platform. From the ICT policy of 2019, the current support in the introduction of e-government project management system is envisage to address efficiency and compliance in the construction industry sectors according to Kenya Government third medium plan 2018-2022 (Ambira, Kemoni & Ngulube, 2019).

The introduction of e-government project management system in construction industry by the NCA is assume will improve the service delivery and reduces the number of man power required to deliver services in the whole country. This was envisaged to address demand of service delivery in construction industry and further address compliance to regulatory requirement according to 2021 NCA performance report (Wanyembi, Gichuki & Kibaara, 2018). Similar attempts have been made in the transport sector by National Transport and Safety Authority (NTSA) according to their 2019 annual report, however it has not been adopted by the passengers and the road transport operators. In the NCA annual performance report of 2019, the project management system was up and running at the end of 2019. In the construction industry, this too could only be

realized if the e-government project management system introduced by government through NCA was adopted by the contractors.

The project management systems incorporation in the construction industry service delivery was based on the premise that given proper adoption in the public sector, it will guarantee equitable access to construction services and it would provide regulations to address failures inherent in the construction sector thus e-government project management systems could be used to improve efficiency and quality service according to ICT policy 2019. Therefore, the need to understand the extent that factors would have on the adoption of e-government project management system by the contractors (Ogola & Nyang'au, 2021).

National Construction Authority is a regulatory body in the construction industry in Kenya, according to the Kenya Government Gazette Notice of 2011. Its' roles were to regulate the construction industry and coordinate its developments, through registration of contractors, accreditation, construction projects registration training of the players in the construction industry, renewal of practising licence, research and development of policies to guide the industry.

Considering that most technical obstacles have been gradually eliminated, the question that arises was whether people were willing to use these new technological achievements (Chismar & Wiley-Patton, 2018). A better understanding of how people use technology and the possibility of using the information technology systems in accessing government services was therefore required, in order for better government

services, government to improve e-government adoption and maximizing its possible acceptance level by the users.

1.3 Purpose of the Study

The purpose of the study was to find out the extent that the factor that affected the adoption of NCA e-government project management system by the contractors in Nairobi, Kenya.

1.4 Statement of the Problem

Despite the potential benefits that E-Government systems can offer in terms of efficiency, transparency, and accountability in project management, there were several pressing challenges and problems that need to be addressed in the context of NCA's operations (Edith & Minja, 2023). Attempts to improve on service delivery and compliance in the construction industry by NCA has not achieved despite introducing e-government construction management system to automate registration of contractors and works, the organization reports of 2021 recorded an increase of 19% in accidents cases in the construction industry, these cases were reported not to be using e-government project management system too. Further, 20% of registered construction workers in the NCA e-government project management system, therefore, a need to undertake a study on the relationship between extrinsic factors and adoption of NCA e-government project management system by the contractors in Kenya (Mbuvi, 2021).

The adoption of E-Government Project Management Systems among contractors working with NCA appears to be at a relatively low level. This raises concerns about the extent to which these systems were being utilized to enhance project management

processes, and whether barriers preventing their widespread use (Korir, 2021). Contractors in the construction industry might face significant challenges related to the availability and adequacy of digital infrastructure, as well as access to necessary resources such as internet connectivity and compatible devices. These factors could impede the effective implementation of E-Government systems (Mbuthia, 2022).

Resistance to change, whether due to a lack of digital literacy, fear of job displacement, or inertia within the industry, could hinder the successful adoption of E-Government Project Management Systems. This resistance might be particularly pronounced among contractors, who may have established routines and practices. The collection and management of sensitive project-related data in E-Government systems raise concerns regarding data security and privacy. Contractors, as well as NCA itself, need to ensure that robust safeguards were in place to protect sensitive information from unauthorized access or breaches (Gacheru & Diang'a, 2021).

The gap in the knowledge public sector adoption of e-government is confirmed by other scholars, the urgent need to investigate the factors that influence contractors' acceptance of e-government project management systems (Vimarland & Olve, 2018). Knowing what determines, what hinders and what drives contractors' acceptance of e-government project management systems is crucial to construction industry (Wilson & Lankton 2018; Shortliffe, 2019; Lansing & Andreassen, 20019; Lofstedt, 2019).

Past studies rightly acknowledged that technology adoption could serve as an important component to improve public service delivery (Gohar *et al.,* 2020). Further studies by Paul *et al.,* (2018) identify the social influences on the technology use. A review of past

studies provides scanty evidence on the construction industry in developing countries. The adoption of E-Government Project Management Systems by contractors, with a specific focus on the National Construction Authority (NCA) in Nairobi, Kenya, presents a critical issue that warrants comprehensive investigation and analysis. The study looked at the extrinsic factors which is operationalized as perceived ease of use, perceived usefulness, social norm and facilitation conditions as independent variables and Adoption as dependent variable.

1.5 Objectives

1.5.1General Objective

Factors affecting the adoption of e-government project management system by Contractors in Nairobi.

1.5.2 Specific Objectives

i. To established effects of Perceived Ease use on adoption of e-government Project Management Systems by Contractors in Nairobi.
ii. To established the effects of Perceived Usefulness on adoption of e-government Project Management Systems by Contractors in Nairobi.
iii. To evaluate the effects of Facilitating Conditions on e-government Project Management Systems on Adoptions by Contractors in Nairobi.
iv. To assess the effects of Social Norm on e-government Project Management Systems on Adoption by Contractors in Nairobi.

1.6 Hypotheses

i. Ho_1(a): Perceived Ease of Use positively affect Adoption of e-government

Project Management Systems by Contractors in Nairobi.

ii. Ho_2(a): Perceived Usefulness positively affect Adoption e-government Project Management Systems by Contractors in Nairobi.

iii. Ho_3(a): Social Norm positively affect Adoption of e-government Project Managements Systems by Contractors in Nairobi.

iv. Ho_4(a): Facilitating Conditions positively affect Adoption of e-government Project Managements Systems by Contractors in Nairobi.

1.7 Significance of the Study

The study was envisaged to be a basis through which the Kenya Government could be guided to develop a policy paper on e-government project management systems roll out in construction industry. The key development partners, could be guided by the study to assist the Kenya Government to address service delivery through implementation of e-government.

The Vision 2030 has ICT as the key growth pillar that would drive the development of Kenya to achieve the Vision 2030 plans, therefore from the study, an empirical literature would guide the construction sector to make informed choice on the implementation of e-government in project management systems. The private vendors in the technology based organizations require empirical evidence to assist them develop technology that would be accepted by the targeted groups according to ICT 2019 policy paper. Therefore, an insight on the e-government adoption by the public would assist the technology based firms to avoid investing in areas that the technology may not be accepted and invest in areas where there are potential gaps.

The study would be of use to the practitioners, policy makers, IT professionals, construction information management practitioners and adopting ICT as a new strategy to address cost and improve service delivery. From the study, the success of e-government project management systems adoption by contractors would assist to address a reduction in human errors, improve compliance in construction industry, and eliminate quacks in the industry.

It would add to the body of knowledge in the Technology Acceptance and Adoption of e-government, it would further bridge gaps in the studies in this area, more so in developing countries.

1.8 Scope of the Study

The scope of a study was the extent to which it explored a particular research area. It defined the boundaries of the study and the parameters within which it was conducted. The study was undertaken in the construction industry within Nairobi City County. Data for this study was collected during the months of November 2023 to December, 2023. The study covered class 4 contractors registered in Nairobi County under NCA. The reasons for choosing Nairobi, was because it is an urban centre with high construction projects. The area has internet fibres serving most areas that make it effective in delivering e-government project management systems infrastructure and support heavy use of the online services. In this study the contractor was the unit of analysis.

1.9 Limitation of the Study

Limitations of a study refer to the constraints, shortcomings, or weaknesses in the research design, methodology, data collection, and analysis that might affect the

validity, generalizability, or interpretation of the study's findings. The findings of this study however, was considered in the light of their limitations. The researcher may not get responses from some of the owners of the construction's companies targeted for the study. This was addressed by ensuring they are contacting on phone and appointment arranged before visiting them. The research sought the assistance of the manager to fill in the questionnaire which may compromise the level of responses. The study relied on self-reported data from contractors to measure their adoption of the EGPM system. This data may be biased, as contractors may have over- or under-reported their adoption of the system.

1.10 Delimitation of the Study

The study delimited itself to construction industry within Nairobi City County regulated by National Construction Authority. This implies that the remaining 46 counties in Kenya were not form part of the study.

1.11 Assumption of the Study

The assumptions of a study refer to the underlying beliefs or conditions that researchers make about the variables, relationships, and the environment in which their research was conducted. These assumptions serve as the foundation upon which the study was built and help guided the research design, data collection, and data analysis.

The following were assumptions of this study. The study assumed that the sample was a representative of the larger population, it further assumed that through validation and reliability, the study assumed that findings from the sample could be generalized to a larger population. The study also assumed that respondents were available to

participate in the study and lastly, the study assumed that respondents were able to differentiate extrinsic factors from other factors.

1.12 Theoretical Framework

Unified Theory of Acceptance and Use of Technology (UTAUT) is an amalgamation of eight technological acceptance models by Venkatesh *et al.,* (2013). UTAUT formulates four main variables, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. For this study performance expectancy and effort expectancy would be replace by Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) respectively which is said to be an exogenous variable. Two behavioral intention variables and use behavior as endogenous variables. UTAUT was one of the most important acceptance theories because it can predict the acceptance of information technology around 70% of the cases according to (Sarstedt, *et al.*, 2017; R. W. Witjaksono, 2020).

Compared with the Technology Acceptance Model (TAM), it could only predict the acceptance of information technology, approximately 40% of cases that have been studied by previous researchers. Besides, UTAUT could link exogenous variables with behavioral intention and use behaviour (Adoption). The construct was a UTAUT construct that has been modified in such a way as to make it simpler. This scale includes six aspects, namely performance expectancy (PE), effort expectancy (EE), social influence (SI), facilitating conditions (FC), behavioral intention (BI), and (Adoption) use behavior. The UTAUT was related to the current study, the four independent variables were covered and dependent variable too was covered in the study, therefore the reason for adopting this model for the current study.

The Unified Theory of Acceptance and Use of Technology (UTAUT) was a well-established model that seeks to understand and predict individuals' acceptance and use of technology. It has been widely applied to various contexts, including the adoption of e-government systems. In the case of contractors adopting an e-government project management system, UTAUT could be a valuable framework to assess and predict their acceptance and use of such a system.

Contractors were likely to adopt an e-government project management system if they believe that it would improve their performance in managing government projects. This could include expectations related to efficiency, accuracy, and effectiveness. Contractors' perceptions of how easy or difficult it was to use the e-government project management system could significantly influence adoption. If the system was perceived as user-friendly and not too complex, it was more likely to be adopted.

Contractors might be influenced by their peers, colleagues, or industry experts. If influential individuals or groups endorse the use of the e-government system, it can positively impact adoption. Additionally, peer pressure and recommendations can play a role. availability of necessary resources, training, and support for contractors is crucial. If the government provides adequate training and resources for using the project management system, it can encourage adoption. Contractors need to trust the e-government system and the government's ability to safeguard data and maintain system reliability. Perceived security and trust in the system are key factors in adoption.

Contractors may perceive risks associated with adopting the system, such as data security or potential negative consequences. The government needed to address these

concerns to increase adoption. The intention to use the e-government project management system was a direct predictor of actual use. Factors such as performance expectancy, effort expectancy, social influence, and trust could influence this intention. Ultimately, UTAUT aimed to predict actual technology usage. If contractors had a positive intention and perceive the system as easy to use and beneficial, they were more likely to use it for managing government projects.

Table 1.1: Contributing Theories and Core Constructs

Theory/Model and Discussion	Core Constructs
Social Cognitive Theory (SCT)	
SCT was one of the most powerful theories of human behaviour (Bandura, 1986). Compeau & Higgins (1995b) applied and extended SCT to the level of computer utilization (Compeau *et al.,* 1999). Although Compeau and Higgins (1995b) studied computer use, the nature of the model and the underlying theory allow it to be extended to the acceptance and use of Information Technology in general (Venkatesh *et al.,* 2003).	• Outcome Expectations-Performance • Outcome Expectations-Personal • Self-Efficacy • Anxiety
Technology Acceptance Model (TAM)	
TAM (Davis, 1989; Davis *et al.,* 1989) was adapted from TRA and tailored to the context of technology acceptance and usage. Unlike TRA, the final conceptualization of TAM excludes the attitude construct in order to better describe intention parsimoniously.	• Perceived Ease of Use • Perceived Usefulness
Extended Technology Acceptance Model (TAM2)	
TAM2 extended TAM by including subjective norm as an additional predictor of intention in the case of mandatory settings (Venkatesh and Davis, 2000).	• Perceived Ease of Use • Perceived Usefulness • Subjective Norm
Unified Theory of Acceptance and Use of Technology (UTAUT)	
The UTAUT (Venkatesh *et al.,* 2003) integrates the fragmented theory and research on individual acceptance of IT into a unified theoretical model that captures the essential elements of eight established models: TRA, TAM, TPB, C-TAM-TPB, Motivational Model (MM), Model of PC Utilization (MPCU), IDT, and SCT. The UTAUT was able to account for 70% of the variance in usage intention – a considerable improvement over any of the original eight models and their extensions.	• Performance Expectancy • Effort Expectancy • Social Influence • Facilitating Conditions

Source: Adapted from Rana *et al.,* (2012)

1.13 Conceptual Framework

This was a diagrammed representation of the direct relationship between independent variables (perceived ease of use, perceived usefulness, facilitating conditions and social norms) and the dependent variable (Adoption of e-government Project Management System) as shown in figure 1.1.

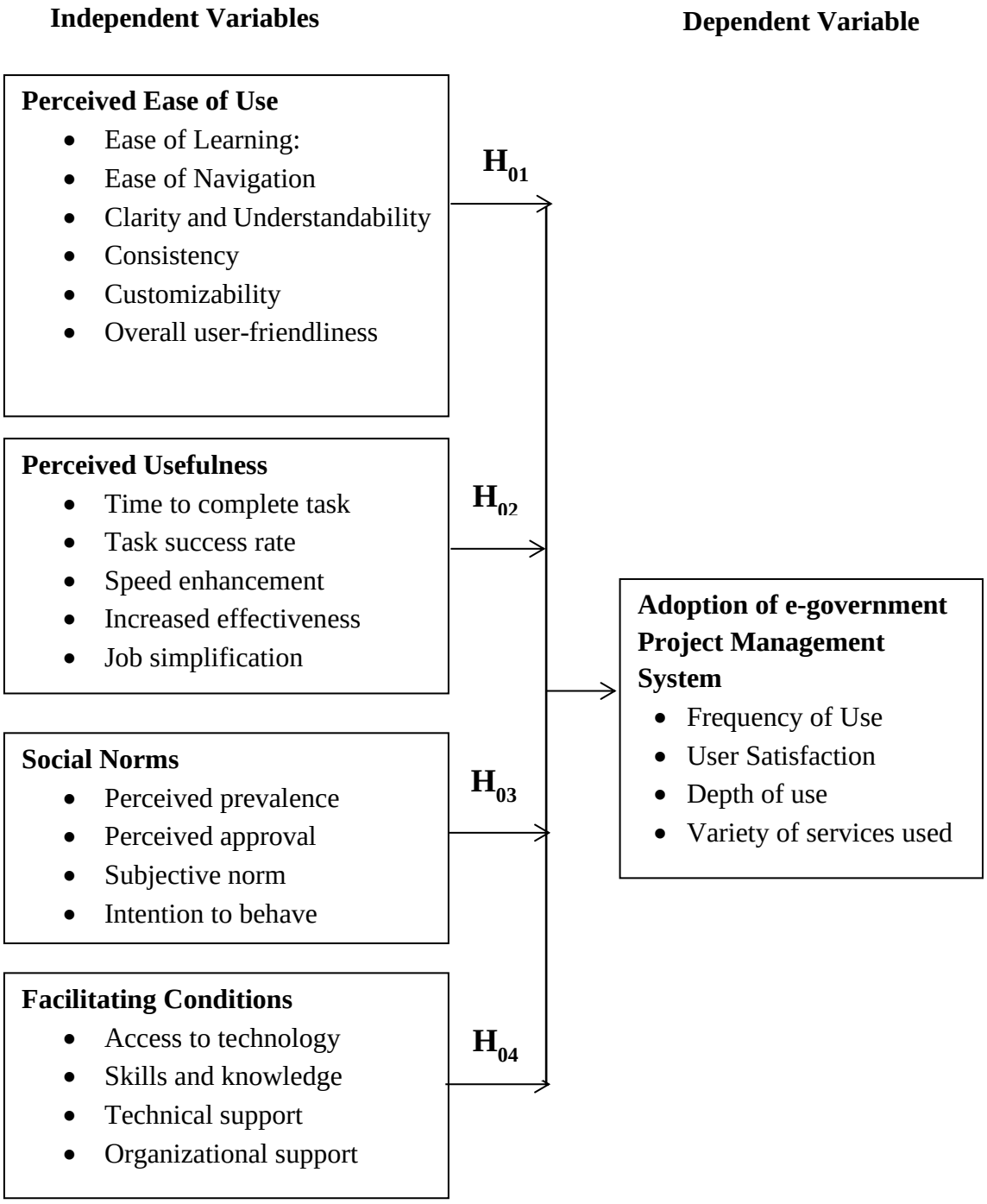


Figure 1.1: Conceptual Framework

Source: *Researcher, 2023*

From the conceptual framework, the study sought to examine the hypothesized relationship between the independent variables (perceived ease of use, perceived usefulness, facilitating conditions and social norms) and the dependent variable (Adoption of e-government Project Management System). The aim was to either accept or reject the alternate hypotheses on whether there exists a significant relationship between each conceptualized independent variables (perceived ease of use, perceived usefulness, facilitating conditions and social norms) and the dependent variable (Adoption of e-government Project Management System).

CHAPTER TWO

LITERATURE REVIEW

2.1Introduction

This chapter explains the concepts that were used in the study. The chapter was organized as follows. The next section describes existing relationships between variables as discussed in past research studies, empirical literature, typologies of the theories supporting the study. Further has literature the construct to be tested in the study, these are Adoption (behaviour usage), Perceived Ease of Use, perceived Usefulness, Facilitating Conditions, Social Norm and demography.

2.2 Empirical Studies

2.2.1 The Perceived Ease of Use and Adoption of E-government Systems

Perceived ease of use (PEOU) was the "degree to which a person believes that using a particular system would be free from effort" (Zhao, Ahn & Manoharan, 2021). Munyoka (2020) suggest that an individual's perception of a system as ease to use or requiring less effort to achieve a task is determined by several factors; the main one being one's level of education, previous experience in using related systems and one's motivation. In the context of e-government adoption and utilisation, citizens who regarded themselves as technologically and Internet savvy, and motivated were most likely to view e-government systems as ease to use and adoptable. For the case of the contractors using the e-project system for service interface between the contractors and NCA, one of the independent constructs that was measured was the PEOU of the system.

In light of this, several studies were attempted to analyze and understand the factors influencing the adoption of e-government services, the e-project management system was an example of the e-government that supports contractors at NCA. Some of these recent studies were indicated that perceived ease of use, perceived service quality, trust, and language were positive determinants of the willingness to adopt e-government services.

Zaman (2020) investigated the impact of perceived ease of use, perceived usefulness, ERP system adoption and end user acceptance in the domain of project management. For this study, a survey was conducted for material handling from employees of project-based organizations including Bini telecom, Robstam, ground zero technologies and IT solutions located in Rawalpindi and Islamabad. The survey questionnaires were administered to the sample of 250 respondents using convenience sampling technique. Data was analyzed by using SPSS version 21. Analysis of collected data indicates that a statistically significant relationship exists between perceived ease of use (PEOU), perceived usefulness (PU) and end user acceptance. Moreover, the results showed that ERP system adoption significantly mediates the relationship between PEOU, PU and end user acceptance. Practical and theoretical implications for this study were also discussed that will be helpful for the employees and project managers. Moreover, researchers on larger scale could draw more promising impacts which would be helpful for the future researchers and project-based organizations.

Elmansori and Ishak (2021) aimed to identify influencing individual and technological factors on the behavioural intention to use the e-government services in Libya. Furthermore, the study sought to identify the influence level of trust factors on the use

behaviour of e-government services. TAM model was utilised to build the constructs of the study. The study carried out structural equation modelling (SEM) to empirically examine the conceptual framework. Results of the structural model indicated a significant positive effect of perceived ease of use, perceived usefulness, IT knowledge, privacy, and facilitating conditions on behavioural intention while the impact of security on behavioural intention was found an insignificant effect. On the other hand, the impact of trust in government, trust in internet, and behavioural intention on use behaviour were significantly affected. Hence, these findings imply that the government, policymakers, and the related authorities should do their best to build the trust of the citizens not only in the government but also towards the internet.

Mensah *et al.*, (2018) sought to investigate the willingness of Russian students in China to use e-government services. The Technology Acceptance Model (TAM) was used as the theoretical framework while the data capture and analysis were done with SPSS. The results indicated that perceived ease of use, perceived service quality, trust, and language were significant in determining the willingness to use e-government services. Language also had a positive impact on the perceived service quality and perceived ease of use. Perceived usefulness was however not significant in influencing the willingness to use. Age, gender and education had a significant direct impact on the perceived ease of use of e-government services. These demographic factors were not significant in deciding the perceived usefulness.

Verkijika and De Wet (2018) sought to contribute to extant knowledge by evaluating the usability of e-government websites from Sub-Saharan Africa (SSA). This was particularly important as little was known about the usability of e-government websites

in the region, and worst still, it is the least advanced region in terms of e-government development. This study evaluated a total of 279 e-government websites from 31 SSA countries. The findings showed that most e-government websites in SSA were characterised by poor usability. The average usability score for the websites was 36.2%, with the most usable website having a score of only 64.8%. The study also showed that the usability of e-government websites was positively associated with the E-Government Development Index (EGDI) and the E-Participation Index (EPI).

Sawalha, Al-Jamal and Abu-Shanab (2019) measured the influence of social networks represented by Facebook on e-government in Jordan. The study extended UTAUT2 with personal innovativeness and yielded a full support of all hypotheses assumed. Performance expectancy, social influence, effort expectancy, personal innovativeness and enjoyment significantly predicted the continuous use of e-government pages on Facebook. The estimated coefficient of determination R^2 was 0.48.

2.2.2 The Perceived Usefulness and Adoption of E-government Systems

Perceived usefulness was defined as the extent to which the individual user believes that using new information technologies would improve his or her job performance (Han & Sa, 2021). It does follow naturally that the user perception that the adoption of new technology would enabled the realization of the objective for the use of such technologies would definitely encourage its usage. The significant impact of perceived usefulness on the intention to use e-government services has been well established in the literature (Chemisto & Rivett, 2018; Mensah *et al.*, 2018). However, the user perception of the perceived usefulness of new technologies such as e-government services can also influence the user to recommend the adoption of it.

Technology acceptance models (TAMs) were also used in a few studies within the construction domain. In a very recent study, Liu *et al.,* (2018) developed an extended TAM to reflect the changes in attitude of construction practitioners that were modelled from a two-year longitudinal study which was conducted in parallel with the development of a e-government system for housing construction. The results of that research show that e-government construction system developers should always improve the usefulness and user-friendliness of a system to facilitate its adoption.

In another study, Niu *et al.,* (2018) discussed that the initiatives of radio frequency identification (RFID) technologies and RFID-enabled management systems are yet to be fully accepted and adopted in practice. Moreover, they proposed findings as a guiding framework to give a better understanding of the practitioners' adoption and use behaviors. The research demonstrated that the construction practitioners' attitude is changing and heavily affected by the project managers who take the roles of system execution, or by peers who have harvested the benefits of such e-government-based systems.

TAM have also been used for studying technology acceptance. In a very recent study on using technology acceptance models for e-government systems acceptance, Hong and Yu (2018) summarized the external variables that influences the use of e-government applications and explained the predicted impacts when the relationship among those external variables are assumed and verified by TAM. In another recent study, (Dieck & Jung, 2018) developed an AR-TAM model that proposed seven other external variables such as data quality, the cost of utilizing, recommendations, system quality, risk, innovativeness and facilitating conditions.

Li and Shang (2020) developed a chain model of e-government service quality, perceived value, and citizens' continuous-use intention to explain the relationship between government website service quality and perceived value, as well as how that relationship influences citizens' reuse intention. Using data collected from a survey of 1,650 citizen users living in one direct-controlled municipality and four high-population cities in China, this study verifies the components of e-government service quality through partial least squares (PLS) analysis and then tests the proposed concept model using structural equation modelling. The results reveal that the concept of e-government service quality has eight contributing dimensions: system quality, reliability, security, accessibility, information quality, service capability, interactivity, and responsiveness. Perceived service value is a powerful mediator between service quality and citizens' continuous-use intention. The intention to use is a consequence of service quality, service value, and satisfaction.

Mohammad, Ebrahimzadeh, Sargolzae and Sepasgozar (2020) conducted a study with the goal of identifying influential factors that have an impact on the development of user intentions. The theoretical research model has been designed based on the technology acceptance model (TAM), as well as technology adoption theory, technology dissemination theory, and planned behavior theory. This study adopted an empirical approach to investigate key acceptance factors in a case organization. The statistical population of this research consisted of customers and employees in different branches of a financial institution called Mehr bank in Iran. The data was collected by means of questionnaires that were completed by 200 customers and employees who work at Mehr bank or have business relationships with it. In addition, structural

equations have been used for inferential analysis. The findings of this study confirmed the direct impact of “perceived usefulness” and “perceived ease of use” towards user attitudes. In addition, results show that “attitude” and “perceived usefulness” have a direct impact on the development of usage intention in customers. However, the results didn’t confirm the role of subjective norms on the development of user intent. This study was limited to a selected organization, and the proposed model should be examined by applying it in different contexts.

Sukma and Leelasantitham (2022) examined the essential aspects that influence a community’s perception of E-Government Continuance Intentions Toward E-Services. A questionnaire with a five-point Likert scale was issued to 1,000 community water consumers, and the researcher received 627 valid responses. Data were collected using a simple random sampling technique with a sampling ratio of 14 villages. Subsequently, descriptive statistics characterize the data (frequency distributions, percentages, averages, medians, and standard deviation). Furthermore, PLS-SEM was utilized to study the interactions between variables and launch the conceptual model via partial least squares (PLS) path modelling. This research demonstrated that digital technologies were critical to boosting community expectations and satisfaction with e-Services. Numerous factors contribute to its growth. Moreover, this paper presented an excellent case study approach based on expectation confirmation theory for examining people’s community participation behaviors regarding e-services. In addition, community water consumers participate in electronic services by confirming their expectations with satisfaction.

Wairiuko, Nyonje and Omulo (2018) sought to establish the influence of ICT Infrastructure on adoption of E-government in the County government of Kajiado in

Kenya. The study was based on pragmatic paradigm. Descriptive survey was used in this study. A sample of 335 respondents was drawn from the target population of 2660 employees from the devolved 10 ministries in Kajiado County using Cochran (2007) formulae. Quantitative data was collected through open and closed-ended questionnaires while qualitative data was collected through an interview guide. Regression models and correlation were used to analyze inferential data and test hypotheses. The study found that ICT infrastructure had a strong positive influence on adoption of E-government. Thus, the study concludes that ICT infrastructure has a significant influence on the adoption of E-government in the County Government of Kajiado. The study recommends that the government of Kenya should develop ICT policy specifically for County governments so as to ensure that challenges such as slow network, lack of infrastructure and power interruptions are addressed.

2.2.3 The Facilitating Conditions and Adoption of E-government Systems

Facilitating conditions were the bedrock upon which the successful adoption of e-government initiatives was built. To harness the full potential of e-government, governments must invest in technological infrastructure, promote digital literacy, prioritize data security and privacy, establish a strong legal framework, demonstrate political commitment, engage citizens, and ensure interoperability. These conditions collectively create an enabling environment where e-government could thrive, ultimately leading to more efficient, transparent and citizen-centric government services. By addressing these facilitating conditions, governments can unlock the transformative power of e-government and deliver on its promises of improved governance and public service delivery.

Facilitating conditions was confirmed as a strong predictor of intention to use e-government systems. This study emphasizes the value on the necessity of governmental agency to give technical support (especially hands on) on e-government systems to citizens that were less technologically-savvy. These findings confirmed and concurred with findings of prior studies (Bwalya, 2018; San *et al.,* 2017; Munyoka and Maharaj, 2017; Venkatesh *et al.,* 2012; Yang and Forney, 2013) in their studies found that when citizens receive the right support (access to better training, ICT resources, time and money) they tend to build some confidence and trust towards adoption as they found such systems ease to use, affordable and of value to them. Consequently, by not rendering the right support to citizens, the entire effort of rolling out e-government may not work.

Previous studies have shown that performance expectancy, social influence, perceived risk, and computer self-efficacy were significant predictors of the attitudes toward the adoption of e-government services (Dwivedi *et al.*, 2017; Verkijika & De Wet, 2018). Also, attitudes, facilitating conditions, the trust of government, and trust in the internet had a direct influence on the individual behavioral intention to use e-government services (Dwivedi *et al.,* 2017; Verkijika & De Wet, 2018). Also, PE, social influence, effort expectancy, personal innovation, and enjoyment were found to significantly determine the continued intention to use e-government services (Sawalha *et al.,* 2019). All these e-government adoption factors integrated models from the information system/technology (IS/IT) theories.

Facilitating conditions was the individual perception that there is available the right technical and organizational capacity and infrastructure to enable him or her to use new technologies successfully (Venkatesh *et al.,* 2013). In the context of e-government,

facilitating conditions depicts the degree to which contractors believe that there are available enough resources to facilitate and encourage them to use and have access to e-government services through the e-project management systems (Verkijika & De Wet, 2018).

The significant impact of facilitating conditions on the behavioral intention to use e-government services and effort expectancy were demonstrated by previous studies (Dwivedi *et al.,* 2017; Kurfalı *et al.,* 2017; Verkijika & De Wet, 2018; Williams *et al.,* 2016). It thus follows that when contractors were sure that there were available the requisite facilitation conditions, it would influence their intention to use and improve their understanding of the effort expectancy of e-government services through the use of project management systems platform.

Bamufleh, Alshamari Alsobhi, Ezzi and Alruhaili (2021) sought to explore factors that determine the public's acceptance of and adoption behavior toward e-government health applications launched in Saudi Arabia (SA) by the Ministry of Health (MOH) during the COVID-19 pandemic. The research relied on several theories: the technology acceptance model (TAM), information system success model (ISSM), mobile services acceptance model (MSAM), and unified theory of acceptance and use of technology (UTAUT). The constructs of perceived ease of use (PEOU), perceived usefulness (PU), attitude (ATT), trust (TR), information quality (IQ), facilitating condition (FC), and social influence (SI) were utilized to investigate the user's intention toward using e-government health applications. The proposed model and its seven hypotheses were tested by conducting a survey across social media among citizens and residents in SA. A total of 785 valid responses were analyzed by Smart PLS and a

structural equation modelling technique. After analysis, the results showed that PEOU, PU, ATT, TR, IQ, FC, and SI have positive effects on behavioral intentions. As for contributions, this paper was the first research paper to investigate the adoption of e-government health applications launched by MOH in SA during the COVID-19 pandemic and to provide a theoretical framework for pursuing future research work in a similar scope.

Mensah (2020) explored the impact of political trust on the adoption of e-government services in China. The data for this study was generated through a research questionnaire instrument. The technology acceptance model (TAM) was used as the theoretical framework for the study while the analysis was done with SPSS. The results indicated that political trust is a significant predictor of the intention to use e-government services. The results also demonstrated that whilst political trust was not significant in predicting the perceived usefulness of e-government services, it was significant in determining the perceived ease of use of e-government services. In addition, this study has shown that political trust has a significant moderating effect on both the impact of perceived usefulness and perceived ease of use on the intention to use e-government services.

Li and Xue (2021) developed a comprehensive model, which consists of antecedents of post-use trust, perceived usefulness, satisfaction, and citizens' continuous-use intention of e-government, to explain how interactional, government, and environmental factors influence citizens' post-use trust as well as how post-use trust influences citizens' continuous-use intention. Using data collected from a survey of 1867 citizen users living in one direct-controlled municipality and four high-population cities in China,

this study tests the proposed concept model using structural equation modelling. The results show that trust in government, trust in the internet, service quality, and information quality have positive effects on citizens' post-use trust. Factors that do not determine a user's post-use trust are the perception of privacy and security, as well as system quality. Another finding was that citizens' post-use trust does not directly influence their continuous intention to use e-government. Post-use trust would impact continuous-use intention through whether or not citizens find using e-government useful and satisfying.

Mensah and Mwakapesa (2023) examined the extent to which e-government information quality dimensions could stimulate the acceptance and utilization of e-government services. The Unified Theory of Acceptance and Use of Technology (UTAUT) was used as the theoretical basis for this paper and the data congregated was evaluated with Analysis of Moment Structures (AMOS) statistical software using the structural equation modelling (SEM) approach. The results have revealed that both effort expectancy and facilitating conditions significantly drive the intention to use and recommend the adoption of e-government services. Also, e-government information quality dimensions such as availability, objectivity, utility, confidentiality, and integrity were all found to positively drive the intention to use e-government services. Additionally, people's intention to use e-government was significant in driving the recommendation behavior of e-government services to others. The practical and research repercussions of these discoveries on the development and deployment of e-government-empowered services were deliberated.

Mansour (2021) conducted a study to identify the factors that influence the use behavior of e-government service among employees of SMEs in Saudi Arabia. This article addressed the effect of behavioral intention as a mediation factor between facilitating condition and the use of e-government services among SMEs in Saudi Arabia. The data were collected from SMEs operating in Riyadh region and SEM-AMOS software was used for data analysis. It was found that the behavioral intention mediates the relationship between Facilitating condition and the use behaviour. The results provide the importance of facilitating condition which linked with the output of the use behavior.

2.2.4 The Social Norm and Adoption of E-government Systems

Social Norm is the extent to which the decision of the individual user to adopt new technologies is influenced by the close relations, friends, and important persons they have respect for. The research findings of social influence on technology adoption are mixed. Although other studies have demonstrated that social influence is positively related to the technology adoption (Oliveira *et al.,* 2016), others have shown otherwise that social influence. This fear has the potential to limit the nature of the interaction of citizens with e-government services (Verkijika & De Wet, 2018).

It thus could be illustrated that when contractors feel that the risk of accessing e-government services was high, they would be discouraged or have negative attitudes toward the adoption of e-government services. Empirical studies have shown that perceived risk was negatively related to both the attitudes and the intention to use e-government services (Veeramootoo *et al.,* 2018; Verkijika & De Wet, 2018).

Subjective norms as a proxy for social influence have been extracted from a theoretical model such as TRA, TPB, TAM2, and C-TAM-TPB, etc. Social influence was also known as peer influence or social influence. The subjective norm is a potent factor that explains the impact of social influence on a person's behavior (Davis, 2019). It was because of subjective norms that people might use a technology to abide by others instead of their own feelings and faiths (Al-Somali, Gholami & Clegg 2019). It was reported as a significant factor in predicting the intent of a contractor towards e-government project management.

Soong, Ahmed and Tan (2020) examined Malaysian small and medium-sized enterprises (SMEs) Adoption of electronic government procurement (EGP) in the post-introduction phase as the portal was introduced in the early year 2000. This study integrated electronic public services into two acceptance theories (the technology acceptance model [TAM] and unified theory of acceptance and use of technology [UTAUT] framework) and having a direct measurement of the criterion. Both TAM and UTAUT models measure the behaviour intention to use and indirectly measure the criterion of actual usage along with behavioural intention. Besides, this study conducted a systematic sampling survey in SMEs located in Klang Valley (the business hub in Malaysia). The results confirm that effort expectancy, performance expectancy and social influences had a direct effect on the adoption of EGP in the private sector. Rather than the original UTAUT setup, the behavioural intention would influence user behaviour. The implications and policy recommendations of these findings will be used by both SMEs and the government to improve the EGP delivery.

Afieroho, Perkins, Zhou, Hoanca and Protasel (2023) utilized the unified theory of acceptance and use of technology to investigate determining factors for the Nigerian public to adopt e-government tools to promote public participation in monitoring PIPs execution. It adopted questionnaire survey and structural equation modelling techniques to show that performance expectancy, facilitating conditions, social influence, and effort expectancy significantly and positively affected behavioral intention to adopt e-government tools to monitor PIPs execution in Nigeria. This study provided scholars with an exploratory baseline for extension of e-government adoption to public infrastructure project management. This study also provided recommendations to policy makers, government technocrats, and project engineers on the need for policy changes, creation of interactive and up-to-date project websites for PIPs in Nigeria.

Using a panel data set gathered from 57 countries over the period 2003 to 2014, Zhao, Ahn and Manoharan (2021) examined the impact of cultural factors on the relationship between e-government development and corruption. The analysis revealed that e-government development had a weak and positive impact on the corruption levels across all countries but varied according to the different cultural factors. Based on the cultural typology of the Globe project, the authors found that e-government development was more effective in reducing corruption in countries with certain cultural characteristics. Cultures that put less emphasis on controlling uncertainty shared power more equally among members, valued individualism, and focused more on future development were more favorable to e-government development than others.

Zahid and Haji Din (2019) aimed to examine the antecedents of the intention to use e-government among the employees of the public universities in Pakistan. The decompose theory of planned behavior (DTPB) model was enriched with the extension of the factor trust and its decomposition by relational bonds. Trust with the support of relational bonds was an effective instrument to build long term relationships, limit the anxiety of the users, and increase behavioral intention. A total of 396 valid responses were collected using the simple random sampling technique from the employees of public universities and responses were evaluated with the SEM. The results indicated that trust and its antecedents (economic bonds, social bonds, and structural bonds), attitude and its antecedents (performance expectancy, effort expectancy), subjective norms and their antecedents (mass media influence, family influence), perceived behavioral control and its antecedents (self-efficacy) have significant and positive effect on intention. However, perceived risk and facilitating condition have insignificant influence on attitude and perceived behavioral control, respectively.

2.3 Summary and Research Gap

The chapter has previous findings and theoretical framework that are relevant the study. The four independent variables in the study and the dependent variable have been covered based on previous study done in different service industry areas. Studies by Dwivedi *et a.,*. (2017) confirms that there are lack fundamental theoretical development in the context of e-government adoption research, therefore a need to further studies in this area. More so in the construction industry in Kenya that has reported an increase of 20% of cases of non-compliance according to NCA report 2020. The four independent variables that will be used in the study have been taken from previous

studies in the technology adoption. These are Technology Adoption Model, Social Cognitive model and Unified Theory of Acceptance and Use of Technology.

The ICT adoption research in the construction sector has concentrated on the prevalence of (ICT) (Ogundile *et al.,* 2019), and the contextual impact on its application according to Chan *et al.,* 2019, Kivunike, *et al.,* 2019 this has been done on the adoption by the consumers in the construction industry. Most of the study have been done in developed nations such as the United States according to empirical studies done by Adriaanse, A. *et al.,* 2018, Canada Rivard *et al.,* 2019, and Sweden Jacobsson *et al.,* (2018), who have explored this area. Many other reports on its use and impact on organizations' success in the construction sector have been published Afolabi *et al.,* (2019), this concentrated on the private organizations. Despite this exhaustive study around continents, only a few studies were undertaken from the standpoint of developing nations, such as Kenya. This research suggests that ICT work in developing countries in the building industry may theoretically deliver a variety of new insights and improvement in service delivery in the construction industry.

Previous studies done by Abdalrahman *et al.,* (2020), in developing countries, Malaysia, Egypt, Saudi Arabia on the adoption of technology, for specific the Building Information Modelling (BIM) among technical experts in construction industry engineers, architecture and quantity surveys reported gaps in the automation of process in the construction industry and adoption, further studies done by Tom Dieek *et al.,* (2018) shared the same findings. However, these studies focused on the firms and professionals in the construction industry but not the regulatory. This confirms a need to study how the contractors adopt to technology in the construction industry.

A scan through the literature on studies on Technology Acceptance and Adoption in the construction industry was very scanty and very little studies have been done in the developing countries. Further, studies done in Kenya by Mosse *et al. (*2020) and Kimani *et al.,* (2019) recommended need for studies in the government regulator. This research is relevant to the developing countries because there are constraints in the accessing government services, compliance challenges that have been witnessed by collapsed of buildings, collapsed of bridges, high construction accidents and there were limited resources available to support the growing construction industry (Ivatury *et al.,* 2020).

The implementation of e-government particularly in developing countries though promising, it is, however, confronted with some impediments, such as the absence of a well thought-out e-government strategy, lack of technological and IT infrastructure, proper policy and legal framework, nature of government reforms, lack of agency readiness, improper cooperation and coordination between and among government sector agencies, and resistance to reforms and change (Al-rawahna *et al.,* 2019; Chen *et al.,* 2018). The cost of installation, operation and maintenance of e-government system, high cost of training IT professionals, and consultancy and inadequate funding of most public sector agencies are some of the issues associated with the operational cost as a barrier to e-government implementation (Mogale, 2021).

Other scholars have also indicated the lack of a fundamental theoretical development in the context of e-government adoption research and consequently called for the development of an e-government-specific unified model to better analyze e-government adoption (Hyytinen, Tuimala & Hammar, 2022).

Based on this gap of lack of a specific and unique e-government adoption models for e-government adoption studies, Mensah, Zeng and Luo (2020) proposed and validated the Unified Model of Electronic Government Adoption (UMEGA) which was based on the basic principle of the UTAUT model. The proposed UMEGA which was an e-government-specific unified model is expected to outperform the other models, including the UTAUT.

Globally, public organisations were progressively embracing electronic government (henceforth, e-government) to improve their back-office operations and to offer better, efficient and transparent 24/7 services to citizens. Several scholars posited that some commendable progress in rolling out e-government systems in developing countries has been made (United Nations, (UN) 2018; Bwalya, 2018). However, the adoption of such systems by citizens remains sluggish and challenging due to several factors, usually associated with the context of implementation and the unique traits of the target users (Ayaz & Yanartaş, 2020). Across the world, such low adoption and utilisation of e-government systems by citizens was used as a barometer to measure the failure of the system (Munyoka, 2020).

It was therefore, imperative to investigate the different factors that affect citizens' perceptions and decisions to adopt e-government systems in order to get to the root of the problem. Credit be given to e-government's great potential and evidence for bringing government services closer to citizens in an efficient, effective and transparent way (United Nations, 2018; Bwalya, 2018). Access to quality education, better health, clean energies and cities are human rights enshrined in the United Nations 2030 agenda for sustainable development goals (SDGs) and e-government was earmarked and

proven in some instances to make an impact in these areas (United Nations 2018). In the case of NCA, the study would look at the adoption of e-government in the construction industry, that has had reported cases of accidents and non-compliance.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1Introduction

This chapter describes the methodology that was used in the study. It begins by presenting an overview of the construction industry as the study area. The next section discusses research design and the justification for its choice, target population and sample size. The Sampling techniques that were used to arrive at the appropriate sample size, the questionnaires, data collection procedures and proposed data analysis methods was used. Subsequent sections describe measures of variables, validity and reliability, and Issues of ethical considerations that was considered in this study.

3.2 Research Site

The study area was Nairobi. The area served high population of construction activities. The reasons for choosing the area were that it an urban centre with high construction activities. The Nairobi areas has internet fibre serving most areas that made it effective in delivering e-government project management system infrastructure and support heavy use of the online services. The contractors were selected as the target of population because they are the interface between the construction industry and the NCA the regulator, further they were directly involved in the direct first line delivery of construction activities.

3.3 Target Population

The target population were the registered contractors from category 4 as per 2021 Register. These contractors were based in Nairobi County. These contractors had used the e-government project management system. Out of a population of 945 contractors

of category 4 registered in Nairobi, a sample size 281 out of the 945 total population were be targeted for the study.

Table 3.1: Targeted Population

Categories	No of Contractors
4	945
Total Population in Nairobi	**945**

Source: Study 2024

3.4 Study Sample and Sampling Technique

3.4.1 Sampling Techniques and Procedure

A survey of category 4 of contractors was done using simple random sampling method. The assumption of this method was that each member was a representative of the sample in that category. Random sampling techniques required that elements in the sampling frame be assigned unique identification codes, usually by numbering them from 1 to n so as to make sample selection procedure simple (Etikan *et al*., 2019)

3.4.2 Sample Size Determination

Out of a population of 945 registered contractors in category 4 in Nairobi a sample size of 281 contractors was adopted for the study. This is considered satisfactory for a quasi-experiment. Although large samples of up to 500 are recommended for explanatory research designs, low samples of up to 50 are considered acceptable (Hair *et al.*, 2016). The formula that the study was used to arrive at a sample of 281 was based to the following formula according to Yamane (1973).

$$n = \frac{N}{1 + Ne^2}$$

Where:

n is the desired sample size

N is the Target population

e is the standard error

When we substitute the values as per the formula

$\frac{945}{1+945(0.05)2} = 281.0408922$

This translates to 281 respondents

Table 3. 2: Sample Size

Categories	No of Contractors	Sample Size
4	945	281
Total Population		

Source Study: 2024

3.5 Research Instrument

The type of data was primary data for the study and the instruments that were used were questionnaires to the target population which were contractors' category 4 in Nairobi. The data collection used mixed method.

3.5.1 Data Collection Instruments

The main instrument that was used for the study was having five parts questionnaire that assisted in the collection of the data from the respondents. The dependent variable in the study was in part one. It had information on the demography, part two and three had independent variables with five likert scales questions. The section two of the

questionnaire had information on the independent variables; these were the Perceived Ease, Perceived Usefulness, Facilitating Conditions and Social Norm.

3.5.2 Pilot Study

In order to test the validity and efficiency of data collection methods, Kothari (2007) asserts that a pilot study was a small-scale preliminary sample before the main research. For the purposes of this study, in order to ensure consistency of terms and consistency of answers, all components of the questionnaires were reviewed and coded and then validated among category 4 of contractors in Kiambu County. Twenty-eight (28) respondents were used for the pilot analysis since it represents 10% of the 281 category 4 contractors. This was because of the requirement to pre-test the testing instruments in a preparatory procedure on a limited group of respondents to figure out whether there was some flaw in the instruments so that they could be fixed.

3.5.3 Validity of Data

Validity referred to the extent to which the instrument measured what it was intended to measure (Engel & Schutt, 2018). In generating items and developing measures, Churchill and Peter (2015) recommended the following procedures; first, definition of the domain, generating the items, specification of the dimensions and investigation of the dimensional. Measures developed using these procedures developed by Engel & Schutt, 2018 were inferred to have higher construct validity than measures developed using other means. Empirical evidence of relationships between constructs was accepted as evidence of validity of both the measures and theory in which the constructs were embedded (Churchill & Peter, 2015). This approach was adopted for the purposes of the study. The approach was used to measure both content and the construct validity

for the study. The construct validity for this study was valid since it captured PEOU, PU, SN and FC and Adoption (behavior usage).

3.5.4 Reliability of Data

Reliability implies the extent which measures were free from random error. The reliability of a scale could be established by the number of items that define the scale and reliability of those items. An observed score for a person was considered a function of the subjects “real score”, systematic error and random error. Random error affects the reliability of a measure and the extent to which it was large indicates the amount of unreliability. Systematic error could reduce reliability and might be found in a reliable measure. Hence, it was widely accepted to be a necessary but not sufficient condition for validity. Reliability coefficients estimate the amount of systematic variance in the measures chosen according to (Lewis & Sauro, 2017).

Cronbach alpha level was checked for internal consistency of the items in the measurement scales and whether statistically acceptable. Coefficient alpha was based on the assumptions that already form a uni-dimensional set and have equal reliabilities. An item to total correlation was performed using SPPS Version 26 software package to check the acceptable threshold limit chosen. According to Hair *et al.*, (2020), the generally agreed upon lower limits of Cronbach alpha is >0.70.

3.5.5 Piloting for Validity and Reliability of research instruments

Content validity involves a thorough examination of the research instruments to ensure that the questions are clear and the content adequately addresses the study variables. In the context of this study, the content validity check involved a comprehensive review

of each question to assess its clarity, relevance, and alignment with the study's variables. This process ensured that the survey items were free from ambiguity and accurately capture the intended information. Through content validity, researchers could enhance the precision and appropriateness of their instruments, thereby strengthening the overall quality of the study.

Reliability of research instruments was tested using Cronbach alpha; which tests internal consistency and the results in Table 3.3.1 shows Cronbach alpha coefficients values of 0.7 and above confirming that reliability of the research instruments. The piloting of the data collection instrument was done in Kiambu County, a total of 28 questionnaires were administered. From the questionnaires, questions that were not making sense to the responders were adjusted for content validity, typo errors were corrected and formatted before collecting data from Nairobi County. Further a test on the reliability test gave value above cronbach alpha 0.7. Therefore, it was appropriate for study.

Table 3.3: Reliability Test

Variable	**Number of Items**	**Cronbach alpha**
Perceived ease of use	6	0.941
Perceived usefulness	6	0.879
Social norm	6	0.957
Facilitating conditions	6	0.958
Adoption of e-government PMS	6	0.861
Summary	**30**	**0.919**

***Source**: Study, 2024*

According to Table 3.3.1, all of the variables had a Cronbach alpha value greater than 0.7. The numbers span from 0.861 for Adoption of e-government PMS to 0.958 for facilitating conditions. According to Bryman (2014) and Murphay and Davidshofer (2008), the research instrument was deemed reliable for the study due to its high Cranach's alpha coefficient (>0.75). This coefficient exceeded the minimum threshold of 0.7 set for this study, confirming its reliability as a data collection tool. The outcome of the reliability test was used to calibrate the instrument and provide training on identified gaps, particularly during the administration process. Data quality was systematically monitored and regularly reinforced during the whole data gathering period.

3.5.5 Data Collection Procedures

The collection of primary data was done using questionnaires. The questionnaires were administered with the aid of research assistants who was given orientation on the process to minimize errors and bias during data collection.

The research instrument was designed to fit the purposes of the study by reviewing related literature in the field and consulting experts within the field for technical advice. Pre-testing was conducted to assess the quality of the questionnaire and its effectiveness in eliciting maximum and expected responses. The questionnaire was piloted in Kiambu County to reduce measurement errors and elicit desirable responses. Research assistants were identified and trained on data collection procedures. The research assistants selected were knowledgeable and conversant with the topic. The principal researcher coordinated the process and provide guidance where necessary. On completion the instruments were reviewed before the coding process and data analysis.

3.6 Data Analysis

Data was analyzed using descriptive and inferential statistics. Statistical analysis was preferred because it performs using version 256 software for analysis which was considered appropriate because it provided a comprehensive set of data transformation and manipulation and comparison of variables of interest in a study. Descriptive statistics generated the frequency distributions, mean comparisons and standard deviation. The purpose of conducting descriptive statistics was to reduce, summarize data and analyze items and constructs. This provides insights into the characteristics of the samples. Descriptive statistics provides a basis for inferential statistics.

The inferential statistics looked at the four independent variables relationship with the dependent variable base on the alternative hypothesis. Further it looked at how close was the relationship between the independent and dependent variable. The study used simple linear and multiple regression analysis.

Simple linear regression was a statistical method used to model the relationship between two variables when one variable (the dependent variable) was believed to be influenced by the other variable (the independent variable). It was called "simple" because it dealt with only one independent variable. Multiple linear regression was a statistical technique used to analyze the relationship between two or more independent variables and a dependent variable. It extended the concept of simple linear regression, which dealt with only one independent variable and one dependent variable.

3.6.1 Multiple regression analysis

For modelling the association between the independent variable and dependent variables, the following multiple regression equation was applied:

$$\mathbf{Y=\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon}$$

Where;

- γ= Dependent variable [adoption of e-government Project Management Systems by Contractors]
- α= Constant; the y intercept or the average response when predictor variables are 0
- X_1= Independent variable 1 [Perceived Ease]
- X_2= Independent variable 2 [Perceived Usefulness]
- X_3= Independent variable 3 [facilitating conditions]
- X_4= Independent variable 4 [social norm]
- ε= error term
- $\beta_1 \ldots B_4$ = Beta Coefficients

3.6.2. Multiple regression model assumptions

The following regression model assumptions as summarized by Hair *et al.* (2006) were put into consideration;

Normality testing was performed using normal-curve histograms. The findings should display a bell-shaped curve showing that data was roughly naturally distributed to satisfy this presumption of normality testing**.**

Test of Linearity refers to the degree to which the change in the dependent variable was related to the change in the independent. That was the independent and dependent variables must have a linear relationship because regression tests linear relationships. In this study all independent variables (Perceived Ease, Perceived Usefulness, facilitating conditions, and social norm) were examined to confirm if they have significant correlation with the dependent variable (e-government Project Management Systems on Adoption by Contractors).

Multicollinearity Multi-collinearity refers to the relationship among the independent variables. Multi-collinearity exists when the independent variables are highly correlated (r= 0.9 and above). Multiple regressions were very sensitive on this. Tabachnick and Fidell (2001) suggest that you 'think carefully before including two variables with a bi-variate correlation of, say, 0.7 or more in the same analysis. To check for multi-collinearity Variance Inflation Factor and Tolerance level was used. A VIF of less than 10 or a tolerance level of greater than 0.1 is acceptable.

3.7 Ethical Considerations

The study made ethical considerations to the respondent's right to informed consent, privacy, confidentiality, anonymity, and researcher's responsibility. The participants were furnished with adequate information regarding the objectives of the study, expected duration of participation, procedures to be followed, potential benefits of the study and extent of privacy and confidentiality. For clarity and conforming to the Kenya law where the study was conducted, an authorization permit was sought from the relevant authority, the National Commission for Science Technology and Innovation, (NACOSTI).

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the analysis of the empirical data obtained during the data collection in study. It examined the rate of response of the targeted respondents, their demographic characteristics and on the four variables that guided the entire study namely; perceived ease of use, perceived usefulness, social norm and facilitating conditions. Questionnaires were the main instruments utilized in data collection.

4.2 Response Rate

The study targeted 281 registered contractors in category 4 in Nairobi. Out of the 281 sampled respondents, 214 questionnaires were able to be returned duly filled ready for coding and analysis. This signifies a response rate of 76.2%. This response rate was much higher compared to past academic studies. For instance, Wangui (2019) obtained a response rate of 70%, while Macharia (2016) acquired a response rate of 78.12%. According to statistical analysis, the majority of experts suggest that a minimum response rate of 30% is necessary in order to perform comprehensive research (Abok, 2013). The response rate attained in the study was therefore considered adequate for the analysis of this research.

Table 4.1: Response Rate

Target Population Category 4	Response	Percentage
281	214	76.2%

Source: *Study, 2024*

4.4 Demographic Characteristics

This section analyses the demographic pattern of the respondents among them being gender, Age of the Respondents, Nationality and using information communication technology.

4.4.1 Age of the Respondents

Understanding the nuanced relationship between age and the adoption of e-government Project Management Systems was crucial for designing effective strategies, training programs, and support mechanisms. It allows policymakers and organizations to tailor their approaches to address the specific needs and concerns of different age groups within the contractor community. The results are shown in Table 4.2.

Table 4. 1: Age of the Respondents

Education Level	Frequency	Percentage
26-30 years	26	12.1
31-35 years	68	31.0
36-40 years	88	41.1
Above 40 years.	32	14.9
Total	**214**	**100**

Source: *Study, 2024*

As indicated in table above, 12.1% of the respondents were between 26 and 30 years, 31.0% were between 31 and 35 years while 41.1% of the respondents were between 36 and 40 years and 14.1% were above 40 years. The age distribution among respondents reveals a diverse demographic, with a small percentage (14.1%) aged above 40 years. This diversity is noteworthy as it captures insights from both younger and more experienced individuals. This age diversity was valuable in understanding perspectives, experiences, and potential disparities in the adoption of e-government Project

Management Systems. A comprehensive approach considering the varied needs of different age groups will be essential for successful implementation and acceptance across the contractor community.

4.4.1 Distribution of Respondents by Gender

The gender of respondents was considered important in this study. This is because according to the Kenyan constitution there is supposed to be fair distribution of job opportunities to both men and women in various opportunities. The respondents were asked to indicate their gender. The results are as shown in table 4.3.

Table 4.2: Distribution of Respondents by Gender

Response	Frequency	Percentage
Male	173	80.8
Female	41	19.2
Total	**214**	**100.0**

Source: *Study, 2024*

As far as this study is concerned majority of the respondents were males representing 80.8% of the respondents which is just slightly above average while the females were rated at 19.2% of the respondents. The notable gender disparity among respondents, with males comprising 80.8% and females 19.2%, emphasizes a predominance of males in the context of e-government Project Management System adoption among contractors in NCA, Nairobi, Kenya. This gender distribution suggests a potential gender-specific pattern in technology adoption. Addressing any gender-based variations in perceptions, challenges, or preferences will be crucial for ensuring inclusivity and maximizing the effectiveness of the e-government project management system within the contractor community in NCA, Nairobi, Kenya.

4.4.2 Distribution of Respondents by Nationality

The study sought to establish the respondents' nationality. The results are as shown in table 4.4:

Table 4.3: Education Level

Education Level	Frequency	Percentage
Kenyan	144	67.3
Rest of Africa	7	3.3
Europe	9	4.2
USA	1	0.5
Middle East	6	2.8
Asia	47	22.0
Total	**214**	**100**

***Source**: Study, 2024*

From Table 4.4, majority of the respondents 67.3% were contractors from Kenya, 3.3% were from the rest of Africa, 4.2% were from Europe, 0.5% from the USA, 2.8% from Middle East and 22.0% were from Asia. The distribution of respondents in Table 4.4 highlights that the majority, 67.3%, were local contractors from Kenya, reinforcing the focus of the study on the domestic context. The diverse representation of contractors from different continents, including Africa, Europe, the USA, the Middle East, and Asia, suggests a global interest in the adoption of e-government Project Management Systems. This global participation implies that insights gained from this study can potentially contribute to a broader understanding of e-government project management practices, with potential applications and relevance beyond the local Kenyan context.

D4 How long have you been using information communication technology?

[01] Below 1yr [02] 1-2 yrs [03] 2-3 yrs [04] 3-4 yrs [04] 4-5 yrs [05] 5-10 years [06] over 10 years

4.4.3 Respondents Duration Using ICT

The respondents were asked to indicate the number of years they have been using ICT. The results are shown in Figure 4.1, whereby 2.3% of the respondents have been using ICT for between 3 and 4 years, 13.6% having been using between 5 and 6 years, 20.1% have been using ICT for between 7 and 8 years, and 26.2% have been using ICT for between 9 and 10 years. Further, 37.8% of the respondents have been using ICT for more than 10 years.

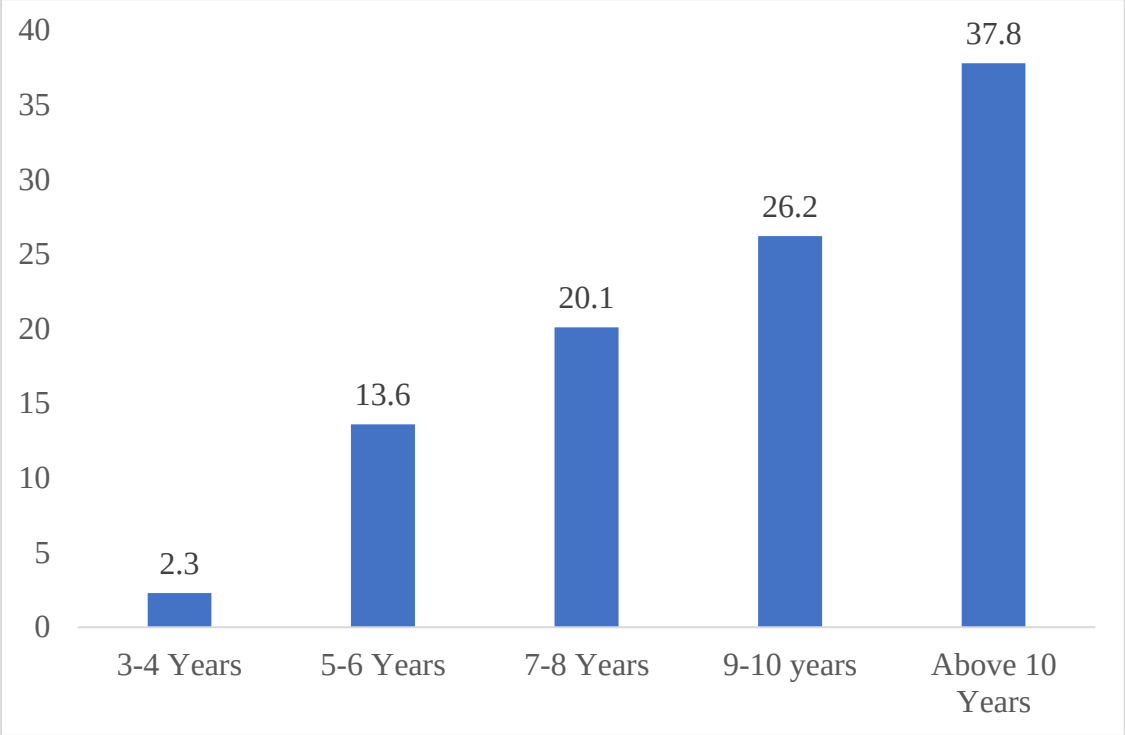


Figure 4.1: Duration Using ICT

The analysis of respondents' experience with ICT in Figure 4.1 reveals a substantial level of expertise, with a notable 37.8% having more than 10 years of experience. This suggested a seasoned and proficient pool of contractors concerning information and

communication technology. The findings imply that the majority of contractors in the study possess a considerable background in ICT, likely influencing their readiness and capability to adopt e-government project management systems. This high level of experience positions the respondents well to comprehend and navigate the complexities associated with integrating technology into project management.

4.5 Descriptive Statistics

The presentation of descriptive statistics was based on the frequencies, percentage, mean and standard deviation of study variables. These variables were perceived ease of use, perceived usefulness, social norm and facilitating conditions which were independent variables while adoption of adoption of e-government Project Management Systems by Contractors in Nairobi County was dependent variable. The respondents were asked to indicate their level of agreement from 1 strongly disagree, 2-Disagree, 3-uncertain, 4-agree and 5 strongly agree. The findings were as follows.

4.5.1 Perceived Ease of Use

The first objective of this study was to examine the effect of perceived ease of use on Adoption of e-government Project Management Systems by Contractors in Nairobi County. In order to achieve this objective, the study therefore sought to find out the extent to which perceived ease of use affects Adoption of e-government Project Managements Systems. The results were presented in Table 4.6 in which percentage are presented inside brackets while frequency outside brackets.

Table 4.4: Perceived ease of use

Perceived ease of use	5	4	3	2	1	Mean	SD
My interaction with e-government project	51.4 (110)	11.2 (24)	25.2 (54)	6.5 (14)	5.6 (12)	3.96	1.24

management systems is clear and understandable							
It was easy for me to become skilful at using at using the e-government project management systems	16.8 (36)	34.6 (74)	28 (60)	15 (32)	5.6 (12)	3.42	1.11
I find the e-government project management system easy to use	31.8 (68)	33.6 (72)	14 (30)	15 (32)	5.6 (12)	3.71	1.22
Learning to operate e-government management systems is easy for me	36.4 (78)	34.6 (74)	16.8 (36)	9.3 (20)	2.8 (6)	3.93	1.08
I find e-government project management systems to be flexible to interact with	37.4 (80)	22.4 (48)	19.6 (42)	15 (32)	5.6 (12)	3.71	1.26
I find it easy to get e-government management systems to do what I want to do	36.4 (78)	19.6 (42)	26.2 (56)	12.1 (26)	5.6 (12)	3.69	1.24
Overall Mean Score						**3.74**	**1.19**

N=214; KEY: 1= Strongly Disagree; 2= Disagree; 3=Uncertain; 4= Agree; 5=Strongly Agree; SD= Standard Deviation.

***Source**: Study, 2024*

From the table 4.6, 51.4 percent (112) of the respondent strongly agreed, 11.2 percent (24) agreed 25.2 percent (54) were neutral, 6.5 percent (14) disagreed while 5.6 percent (12) strongly disagreed that their interaction with e-government project management systems is clear and understandable. This was further supported by a mean of 3.96 and a significant standard deviation of 1.24. Similarly, 16.8 percent (36) of the respondent strongly agreed, 34.6 percent (74) agreed 28 percent (60) were neutral, 15 percent (32) disagreed while 5.6 percent (12) strongly disagreed that it was easy for me to become skilful at using at using the e-government project management systems. This was further supported by a mean of 3.42 and a significant standard deviation of 1.11.

The results further revealed that 31.8 percent (68) of the respondent strongly agreed, 33.6 percent (72) agreed, 14 percent (30) were neutral, 15 percent (32) disagreed while 5.6 percent (12) strongly disagreed that they find the e-government project management

system easy to use. This was also confirmed by a mean of 3.71 and a significant standard deviation of 1.22. Furthermore, 36.4 percent (78) of the respondents strongly agreed, 34.6 percent (74) agreed, 16.8 percent (36) were neutral and 9.3 percent (20) disagreed while 2.8 percent (6) strongly disagreed that learning to operate e-government management systems is easy for them. This was supported by a mean of 3.93 and a significant standard deviation of 1.08.

According to the results, 37.4 percent (80) of the participants strongly agreed, 22.4 percent (48) agreed, 119.6 percent (42) were neutral, 15 percent (32) disagreed while 5.6 percent (12) strongly disagreed that they find e-government project management systems to be flexible to interact with. The results were supported by a mean of 3.71 and a significant standard deviation of 1.26. Moreover, 36.4 percent (78) of the respondents strongly agreed, 19.6 percent (42) agreed, 26.2 percent (56) were neutral and 12.1 percent (26) disagreed while 5.6 percent (12) strongly disagreed that they find it easy to get e-government management systems to do what they want to do with a mean of 3.69 and a significant standard deviation of 1.24.

The comprehensive analysis of respondents' perceptions on their interaction with e-government project management systems yields valuable insights. The majority, with 51.4%, strongly agree that their interaction with the systems was clear and understandable, corroborated by a mean of 3.96. A significant portion (36.4%) also strongly agreed that learning to operate these systems is easy, supported by a mean of 3.93. However, a notable percentage (25.2%) remained neutral on the clarity and ease of use aspects. The results highlighted a need for enhanced user training or support mechanisms to bridge potential gaps in understanding. Additionally, the positive

perceptions regarding flexibility (37.4%) and ease of task accomplishment (36.4%) underscore the potential benefits of e-government project management systems. Organizations should leverage these findings to streamline user interfaces, improve training, and ensure that user-friendly features were prioritized in system design.

The findings from the study with a mean of 3.74 and SD of 119 correlates with the score of 4, this confirms from empirical study that the contractors agree with the measure of PEOU and the SD is very low from the standard mean.

4.5.2 Perceived Usefulness

The second objective of this study was to evaluate the effect of perceived usefulness on Adoption of e-government Project Management Systems by Contractors in Nairobi County. So as to achieve this objective, the study sought to establish the degree to which perceived usefulness influenced Adoption of e-government Project Managements Systems. The findings were as shown in table 4.7 in which percentages were presented inside brackets while frequency outside brackets.

Table 4. 5: Perceived Usefulness

Perceived usefulness	5	4	3	2	1	Mean	SD
I find the e-government project management systems useful in my practice	27.6 (59)	38.8 (83)	22.4 (48)	2.8 (6)	8.4 (18)	3.74	1.14
Using the e-government project management systems enables me to accomplish tasks more quickly	30.4 (65)	23.8 (51)	28 (60)	11.2 (24)	6.5 (14)	3.60	1.21
Using the e-government project management systems increase my practice productivity	17.8 (38)	36.4 (78)	34.6 (74)	8.4 (18)	2.8 (6)	3.58	0.97
If I use the e-government project management systems, I will increase my chances of getting good results in my practice	15.9 (34)	41.6 (89)	28.5 (61)	11.2 (24)	2.8 (6)	3.57	0.98
Using e-government project management systems enhance my effectiveness in construction industry	34.1 (73)	37.9 (81)	16.8 (36)	8.4 (18)	2.8 (6)	3.92	1.05
The e-government project management system simplifies and automates repetitive tasks, freeing up my time for more strategic activities.	34.1 (73)	31.8 (68)	20.1 (43)	8.4 (18)	5.6 (12)	3.80	1.16
Overall Mean Score						**3.7**	**1.09**

N=214; KEY: 1= Strongly Disagree; 2= Disagree; 3=Uncertain; 4= Agree; 5=Strongly Agree; SD= Standard Deviation.

***Source**: Study, 2024*

From the table 4.7, 27.6 percent (59) of the respondent strongly agreed, 38.8 percent (83) agreed 22.4 percent (48) were neutral, 2.8 percent (6) disagreed while 8.4 percent (18) strongly disagreed that they find the e-government project management systems useful in my practice. This was further supported by a mean of 3.74 and a significant standard deviation of 1.14. Similarly, 30.4 percent (65) of the respondent strongly agreed, 23.8 percent (51) agreed 28 percent (60) were neutral, 11.2 percent (24) disagreed while 6.5 percent (14) strongly disagreed that using the e-government project

management systems enables me to accomplish tasks more quickly. This was further supported by a mean of 3.60 and a significant standard deviation of 1.21.

The results further revealed that 17.8 percent (38) of the respondent strongly agreed, 33.4 percent (78) agreed, 34.6 percent (74) were neutral, 8.4 percent (18) disagreed while 2.8 percent (6) strongly disagreed that using the e-government project management systems increase my practice productivity. This was also confirmed by a mean of 3.58 and a significant standard deviation of 0.97. Furthermore, 15.9 percent (34) of the respondents strongly agreed, 41.6 percent (89) agreed, 28.5 percent (61) were neutral and 11.2 percent (24) disagreed while 2.8 percent (6) strongly disagreed that if they use the e-government project management systems, they would increase my chances of getting good results in my practice. This was supported by a mean of 3.57 and a significant standard deviation of 0.98.

According to the results, 34.1 percent (78) of the participants strongly agreed, 37.9 percent (81) agreed, 16.8 percent (36) were neutral, 8.4 percent (18) disagreed while 2.8 percent (6) strongly disagreed that using e-government project management systems enhance my effectiveness in construction industry. The results were supported by a mean of 3.92 and a significant standard deviation of 1.05. Moreover, 34.1 percent (73) of the respondents strongly agreed, 31.8 percent (68) agreed, 20.1 percent (43) were neutral and 8.4 percent (18) disagreed while 5.6 percent (12) strongly disagreed that the e-government project management system simplifies and automates repetitive tasks, freeing up my time for more strategic activities with a mean of 3.80 and a significant standard deviation of 1.64.

From the empirical finding the Standard Deviation was 1.09 and mean was 3.7, this is close to the score of 4 which was agreement with the PU. This was a positive indicator of agreement by the contractors on the use of e-project management system.

The findings from respondents' perceptions regarding the utility and impact of e-government project management systems reveal significant positive sentiments. A substantial proportion, with 27.6% strongly agreeing and 38.8% agreeing, emphasizes the systems' usefulness in practice, supported by a mean of 3.74. Additionally, a considerable percentage acknowledges the systems' role in task efficiency (30.4% strongly agreeing) and productivity enhancement (34.1% strongly agreeing). The positive mean scores in these areas, such as 3.60 and 3.58, affirm the perceived benefits. The emphasis on the systems' contribution to effectiveness in the construction industry (34.1% strongly agreeing) and automation of repetitive tasks (34.1% strongly agreeing) further underscores their potential impact. Organizations could leverage these insights to emphasize the practical benefits of e-government project management systems and tailor training programs to enhance user proficiency and capitalize on these advantages.

4.5.3 Social Norm

The third objective of this study was to determine the effect of social norm on Adoption of e-government Project Management Systems by Contractors in Nairobi County. In order to achieve this objective, the study first sought to establish in what ways social norm influenced Adoption of e-government Project Managements Systems. The findings are in table 4.8 in which percentage were presented inside brackets while frequency outside the brackets.

Table 4.6: Social norm

Social norm	5	4	3	2	1	Mean	SD
My seniors in construction and friends are helpful using E-government project management systems	15 (32)	40.7 (87)	27.1 (58)	14.5 (31)	2.8 (6)	3.50	1.01
Friends think I should use e-government project management system	20.6 (44)	37.9 (81)	27.1 (58)	11.7 (25)	2.8 (6)	3.62	1.03
My contractors in the same category think I should use e-government project management systems	23.4 (50)	37.9 (81)	24.3 (52)	11.7 (25)	2.8 (6)	3.67	1.05
My clients and category below me think I should use e-government project management systems	32.7 (70)	34.1 (73)	22 (47)	8.4 (18)	2.8 (6)	3.86	1.06
My professional body in my practise think I should use e-government project management systems	27.1 (58)	43 (92)	18.7 (40)	8.4 (18)	2.8 (6)	3.83	1.01
I have strong intention to adopt and regularly use the e-Government Project Management System	29.4 (63)	37.4 (80)	24.8 (53)	5.6 (12)	2.8 (6)	3.85	1.00
Overall Mean Score						**3.72**	**1.03**

N=214; KEY: 1= Strongly Disagree; 2= Disagree; 3=Uncertain; 4= Agree; 5=Strongly Agree; SD= Standard Deviation.

***Source**: Study, 2024*

From the table 4.8, 15 percent (32) of the respondent strongly agreed, 40.7 percent (87) agreed 27.1 percent (58) were neutral, 14.5 percent (31) disagreed while 2.8 percent (6) strongly disagreed that their seniors in construction and friends are helpful using E-government project management systems. This was further supported by a mean of 3.50 and a significant standard deviation of 1.01. Similarly, 20.6 percent (44) of the respondent strongly agreed, 37.9 percent (81) agreed 27.1 percent (58) were neutral, 11.7 percent (25) disagreed while 2.8 percent (6) strongly disagreed that Friends think

they should use e-government project management system. This was further supported by a mean of 3.62 and a significant standard deviation of 1.03.

The results further revealed that 23.4 percent (50) of the respondent strongly agreed, 37.9 percent (81) agreed, 24.3 percent (52) were neutral, 11.7 percent (25) disagreed while 2.8 percent (6) strongly disagreed that their contractors in the same category think they should use e-government project management systems. This was also confirmed by a mean of 3.67 and a significant standard deviation of 1.05. Furthermore, 32.7 percent (70) of the respondents strongly agreed, 34.1 percent (73) agreed, 22 percent (47) were neutral and 8.4 percent (18) disagreed while 2.8 percent (6) strongly disagreed that their clients and category below them think they should use e-government project management systems. This was supported by a mean of 3.86 and a significant standard deviation of 1.06.

According to the results, 27.1 percent (58) of the participants strongly agreed, 43 percent (92) agreed, 18.7 percent (40) were neutral, 8.4 percent (18) disagreed while 2.8 percent (6) strongly disagreed that their professional body in my practise think they should use e-government project management systems. The results were supported by a mean of 3.83 and a significant standard deviation of 1.01. Moreover, 29.4 percent (63) of the respondents strongly agreed, 37.4 percent (80) agreed, 24.8 percent (53) were neutral and 5.6 percent (12) disagreed while 2.8 percent (6) strongly disagreed that they have strong intention to adopt and regularly use the e-Government Project Management System with a mean of 3.85 and a significant standard deviation of 1.00.

The study's findings reveal that social influence plays a crucial role in shaping respondents' attitudes toward the adoption of e-government project management systems. A significant percentage, with 40.7% agreeing and 15% strongly agreeing, emphasizes the helpfulness of seniors and friends in using these systems, supported by a mean of 3.50. Similarly, positive sentiments are observed regarding friends' expectations, contractors' views, clients' perceptions, and professional bodies, all contributing to a positive inclination toward system adoption. The mean scores ranging from 3.62 to 3.86, accompanied by significant standard deviations, highlight the diversity in responses. The strong intention expressed by respondents to adopt and regularly use the e-Government Project Management System, with a mean of 3.85, reflects a positive predisposition, underlining the potential for successful implementation. Organizations can capitalize on these social influences to foster a supportive environment for the widespread adoption of e-government project management systems within the construction industry.

The mean of the social norm is 3.72 and SD is 1.03, this points to the majority of the contractors agreeing that social norm influenced their adoption of e-government project management system. The regulator would invest more in their professional bodies to improve on adoption of e-government project management system.

4.5.4 Facilitating Conditions

The fourth objective of this study was to assess the effect of facilitating conditions on Adoption of e-government Project Management Systems by Contractors in Nairobi County. So as to achieve this objective, the researcher sought to find out how facilitating conditions influences the Adoption of e-government Project Managements

Systems. The results are presented in Table 4.9 in which percentage are presented inside brackets while frequency outside brackets.

Table 4. 7: Facilitating Conditions

Facilitating conditions	5	4	3	2	1	Mean	SD
I have the resources necessary to use e-government project management system	20.6 (44)	35.5 (76)	19.6 (42)	5.6 (12)	18.7 (40)	3.34	1.37
e-government project management systems are compatible with other technologies I use	39.7 (85)	31.3 (67)	11.2 (24)	2.8 (6)	15 (32)	3.78	1.39
I can get help from NCA when I have difficulties using e-government project management system	17.8 (38)	43.9 (94)	16.8 (36)	2.8 (6)	18.7 (40)	3.39	1.33
The e-government project management systems are reliable and I can get all the information that I need to use	20.6 (44)	38.3 (82)	22.4 (48)	0 (0)	18.7 (40)	3.42	1.34
The e-government project management systems facilities are easily accessible to me	12.1 (26)	61.7 (132)	11.2 (24)	0 (0)	15 (32)	3.56	1.18
I have requisite skills and technology to use e-government project management system	27.1 (58)	31.8 (68)	22.4 (48)	3.7 (8)	15 (32)	3.52	1.33
Overall Mean Score						**3.5**	**1.32**

N=214; KEY: 1= Strongly Disagree; 2= Disagree; 3=Uncertain; 4= Agree; 5=Strongly Agree; SD= Standard Deviation.

***Source**: Study, 2024*

From the table above, 20.6 percent (44) of the respondent strongly agreed, 35.5 percent (76) agreed 19.6 percent (42) were neutral, 5.6 percent (12) disagreed while 18.7 percent (40) strongly disagreed that they have the resources necessary to use e-government project management system. This was further supported by a mean of 3.34 and a significant standard deviation of 1.37. Similarly, 39.7 percent (85) of the respondent strongly agreed, 31.3 percent (67) agreed 11.2 percent (24) were neutral, 2.8 percent (6) disagreed while 15 percent (32) strongly disagreed that e-government

project management systems are compatible with other technologies they use. This was further supported by a mean of 3.78 and a significant standard deviation of 1.39.

The results further revealed that 17.8 percent (38) of the respondent strongly agreed, 43.9 percent (94) agreed, 16.8 percent (36) were neutral, 2.8 percent (6) disagreed while 18.7 percent (40) strongly disagreed that they can get help from NCA when they have difficulties using e-government project management system. This was also confirmed by a mean of 3.39 and a significant standard deviation of 1.33. Furthermore, 20.6 percent (44) of the respondents strongly agreed, 38.3 percent (82) agreed, 22.4 percent (48) were neutral while 18.7 percent (40) strongly disagreed that the e-government project management systems are reliable and they could get all the information that they need to use. This was supported by a mean of 3.42 and a significant standard deviation of 1.34.

According to the results, 12.1 percent (26) of the participants strongly agreed, 61.7 percent (132) agreed, 11.2 percent (24) were neutral, while 15 percent (32) strongly disagreed that the e-government project management systems facilities are easily accessible to me. The results were supported by a mean of 3.56 and a significant standard deviation of 1.18. Moreover, 27.1 percent (58) of the respondents strongly agreed, 31.8 percent (68) agreed, 22.4 percent (48) were neutral and 3.7 percent (8) disagreed while 15 percent (32) strongly disagreed that they have requisite skills and technology to use e-government project management system with a mean of 3.52 and a significant standard deviation of 1.33.

The findings present a nuanced perspective on the perceived resources and challenges related to the adoption of e-government project management systems among

respondents. Notably, a considerable portion expressed concerns about resource adequacy, with 20.6% strongly agreeing and 35.5% agreeing that they have the necessary resources. This sentiment was reinforced by a mean of 3.34 and a standard deviation of 1.37. Furthermore, the compatibility of e-government systems with other technologies raised mixed sentiments, with 39.7% strongly agreeing and 31.3% agreeing, resulting in a mean of 3.78 and a significant standard deviation of 1.39.

Respondents also conveyed varying perceptions of the support provided by NCA, where 17.8% strongly agreed and 43.9% agreed, yielding a mean of 3.39 and a standard deviation of 1.33. The reliability of e-government systems, as indicated by 20.6% strongly agreeing and 38.3% agreeing, was reflected in a mean of 3.42 and a standard deviation of 1.34. Additionally, respondents acknowledged accessibility challenges, with 12.1% strongly agreeing and 61.7% agreeing, resulting in a mean of 3.56 and a standard deviation of 1.18. The perceived adequacy of skills and technology displayed a mixed response, with 27.1% strongly agreeing and 31.8% agreeing, yielding a mean of 3.52 and a significant standard deviation of 1.33. These findings underscore the multifaceted nature of considerations surrounding the successful implementation of e-government project management systems.

4.5.5 Adoption of e-government Project Management Systems by Contractors in Nairobi County

The general objective of the study was to examine effect extrinsic factor on Adoption of e-government Project Management Systems by Contractors in Nairobi County. The results were presented in Table 4.10 in which percentage were presented inside brackets while frequency outside brackets.

Table 4.8: Adoption of E-government Project Managements Systems

Adoption of e-government Project Managements Systems	5	4	3	2	1	Mean	SD
I am satisfied with the integration of the e-GPMS with other government services	12.1 (26)	36.4 (78)	34.1 (73)	14.5 (31)	2.8 (6)	3.41	0.97
I explore and leverage new features as they become available	12.1 (26)	47.7 (102)	25.7 (55)	11.7 (25)	2.8 (6)	3.55	0.95
I have explored and utilized a variety of services offered by the system, such as document sharing, collaboration tools, or reporting features?	36 (77)	50 (107)	11.2 (24)	0 (0)	2.8 (6)	4.16	0.84
I explore additional modules or features beyond the basic project management tools offered by the system	44.9 (96)	35.5 (76)	14 (30)	2.8 (6)	2.8 (6)	4.17	0.96
I am satisfied with the system's user interface and ease of navigation	42.1 (90)	35 (75)	8.4 (18)	5.6 (12)	8.9 (19)	3.96	1.24
I frequently log in to the system to access project-related information or perform tasks	21 (45)	32.2 (69)	26.2 (56)	12.1 (26)	8.4 (18)	3.45	1.19
Overall Mean Score						**3.78**	**1.03**

N=214; KEY: 1= Strongly Disagree; 2= Disagree; 3=Uncertain; 4= Agree; 5=Strongly Agree; SD= Standard Deviation.

***Source**: Study, 2024*

From the table 4.10, 12.1 percent (26) of the respondent strongly agreed, 36.4 percent (78) agreed 34.1 percent (73) were neutral, 14.5 percent (31) disagreed while 2.8 percent (6) strongly disagreed that they are satisfied with the integration of the e-GPMS with other government services. This was further supported by a mean of 3.41 and a significant standard deviation of 0.97. Similarly, 12.1 percent (26) of the respondent strongly agreed, 47.7 percent (102) agreed 25.7 percent (55) were neutral, 11.7 percent (25) disagreed while 2.8 percent (6) strongly disagreed that they explore and leverage

new features as they become available. This was further supported by a mean of 3.55 and a significant standard deviation of 0.95.

The results further revealed that 36 percent (77) of the respondent strongly agreed, 50 percent (107) agreed, 11.2 percent (24) were neutral, while 2.8 percent (6) strongly disagreed that they have explored and utilized a variety of services offered by the system, such as document sharing, collaboration tools, or reporting features. This was also confirmed by a mean of 4.16 and an insignificant standard deviation of 0.84. Furthermore, 44.9 percent (96) of the respondents strongly agreed, 35.5 percent (76) agreed, 14 percent (30) were neutral and 2.8 percent (6) disagreed while 2.8 percent (6) strongly disagreed that they explore additional modules or features beyond the basic project management tools offered by the system. This was supported by a mean of 4.17 and a significant standard deviation of 0.96.

According to the results, 42.1 percent (90) of the participants strongly agreed, 35 percent (75) agreed, 8.4 percent (18) were neutral, 5.6 percent (12) disagreed while 8.9 percent (19) strongly disagreed that they are satisfied with the system's user interface and ease of navigation. The results were supported by a mean of 3.96 and a significant standard deviation of 1.24. Moreover, 21 percent (45) of the respondents strongly agreed, 32.2 percent (69) agreed, 26.2 percent (56) were neutral and 12.1 percent (26) disagreed while 8.4 percent (18) strongly disagreed that they frequently log in to the system to access project-related information or perform tasks with a mean of 3.45 and a significant standard deviation of 1.19.

The findings from the respondents indicate diverse perspectives on their satisfaction and utilization of the e-Government Project Management System (e-GPMS). Notably, a considerable proportion expressed satisfaction with the integration of e-GPMS with other government services (48.5% strongly agreed or agreed) and their ability to explore and leverage new features (59.8% strongly agreed or agreed). Furthermore, a significant majority reported having explored and utilized various services offered by the system (86.5% strongly agreed or agreed), including document sharing, collaboration tools, and reporting features. Additionally, respondents demonstrated a positive inclination toward exploring additional modules or features beyond basic project management tools (79.3% strongly agreed or agreed). However, satisfaction with the system's user interface and ease of navigation varied, with 77.1% expressing satisfaction. The frequency of logging into the system for project-related tasks also showed mixed responses. These findings collectively suggest a generally positive reception of the e-GPMS, highlighting its perceived effectiveness and utility in project management.

4.6 Inferential Statistics

The study undertook inferential statistics which comprise of simple and multiple linear regression analysis. The purpose of regression analysis was to test the study alternate hypotheses and therefore achieve study specific objectives. All hypotheses were test at significance level of 0.05.

4.6.1 Testing of Regression Model Assumptions

Before conducting linear regression analysis, the study sought to find out if the assumptions of linear regression analysis have been met. This includes

Multicollinearity (VIF), Normality (Histogram with superimposed normal curve) and linearity (Pearson correlation analysis).

Test for Multicollinearity

Multicollinearity is a situation in which the predictor variables in a multiple regression analysis are themselves highly correlated making it difficult to determine the actual contribution of respective predictors to the variance in the dependent variable. The multicollinearity assumption has a VIF threshold value of 10 maximum (Robinson, 2009). The VIF value in the Table 4.11, are less than 10 so there is no multi-Collinearity problem in study variables.

Table 4. 9: Multicollinearity Test

Variable	Tolerance	VIF
Perceived ease of use	.768	1.302
Perceived usefulness	.705	1.418
Social norm	.768	1.302
Facilitating conditions	.729	1.373

***Source**: Study, 2024*

Test for Normality

Ghasemi and Zahedias (2012) recommend that normality be assessed visually. Normality was tested using histograms with normal curve. SPSS outputs attached in the appendix IV shows results of histograms with normal curve graphs that were bell-shaped confirming that data was approximately normally distributed thus met this assumption of normality. Further, the study also used regression plot. A residual plot is a graph that shows the residuals on the vertical axis and the independent variable on the

horizontal axis. If the points in a residual plot are randomly dispersed around the horizontal axis, a linear regression model is appropriate for the data. This is a shown in Figure 4.2.

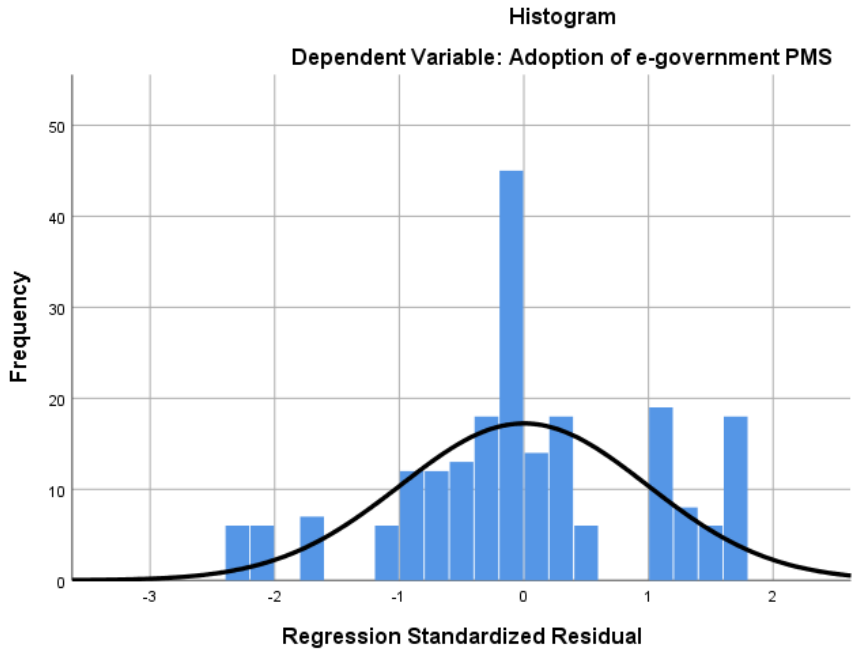


Figure 4.2: Normality Distribution

Test for Linearity

Linearity was tested by use of Pearson Correlation analysis which computes both the linear and nonlinear components of a pair of variables. Linear regression analysis assumes there was linear relationship between independent and dependent variables. The linearity was as a result of significance level being less than 0.05 which was evident for all study variables. All linear relationships were significant at 0.01 (99.0% confidence level). The results are as shown in Table 4.12.

Table 4.10: Pearson Correlation Analysis

		PEU	PU	SN	C
PEU=Perceived ease of use	Pearson Correlation	1			
	Sig. (1-tailed)				
	N	214			
PU=Perceived usefulness	Pearson Correlation	.441**	1		
	Sig. (1-tailed)	.000			
	N	214	214		
SN=Social norm	Pearson Correlation	-.075	.189**	1	
	Sig. (1-tailed)	.278	.005		
	N	214	214	214	
FC =Facilitating conditions	Pearson Correlation	-.033	.288**	.468**	1
	Sig. (1-tailed)	.627	.000	.000	
	N	214	214	214	214
Adoption of e-government PMS	Pearson Correlation	.397**	.663**	.506**	.572**
	Sig. (1-tailed)	.000	.000	.000	.000
	N	214	214	214	214

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

***Source**: Study, 2024*

The results indicated that perceived ease of use had a positive linear relationship (r=0.397) with Adoption of e-government Project Management Systems by Contractors in Nairobi County. This indicated that perceived ease of use plays a major role in ensuring Adoption of e-government Project Managements Systems. The results indicate that there is strong positive linear relationship between perceived usefulness and Adoption of e-government Project Management Systems by Contractors in Nairobi County (Pearson correlation coefficient= 0.663). Perceived usefulness therefore has a very great influence on the Adoption of e-government Project Managements Systems.

The analysis in table 4.12 show that social norm has a positive linear relationship (r= 0.506) with adoption of e-government Project Managements Systems. This indicates that social norm factors cannot be ignored whenever considering the Adoption of e-

government Project Managements Systems. The results showed that there is positive linear relationship between facilitating conditions and Adoption of e-government Project Managements Systems s (Pearson correlation coefficient, r= 0.572). This implies that facilitating conditions is very necessary in attaining Adoption of e-government Project Managements Systems.

4.6.2 Linear Regression Results

Linear regression analyses were used to test the alternate hypotheses used in this study. The study used two types of linear regression analysis, the simple linear regression analysis for each independent variable while multiple linear regression analysis was used to establish the regression coefficients using beta coefficients. The study used significance level of beta coefficients in multiple linear regressions to test alternate hypotheses. The R square was used to tell the amount of change in Adoption of e-government Project Management Systems by Contractors in Nairobi County that is been accounted for by the independent variables. The significance level was at 0.05.

4.6.2.1 Influence of Perceived ease of use on Adoption of e-government Project Management Systems by Contractors in Nairobi County

The first objective of the study was to established effects of Perceived Ease on adoption of e-government Project Management Systems by Contractors. This was achieved by carrying out simple linear regression to establish the coefficient of determination (r^2) which explains changes in Adoption of e-government Project Management Systems by Contractors in Nairobi County that is been accounted for by perceived ease of use. The results are as shown in Table 4.13.

Table 4.11: Regression Results of Perceived ease of use and Adoption of e-government Project Managements Systems

					Change Statistics			
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.397[a]	.158	.154	.73183	.158	39.712	1	212	.000

a. Predictors: (Constant), Perceived ease of use

b. Dependent Variable: Adoption of e-government Project Management Systems

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	21.269	1	21.269	39.712	.000[b]
	Residual	113.543	212	.536		
	Total	134.813	213			

a. Dependent Variable: Adoption of e-government Project Management Systems

b. Predictors: (Constant), Perceived ease of use

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.655	.186		14.290	.000
	Perceived ease of use	.302	.048	.397	6.302	.000

a. Dependent Variable: Adoption of e-government Project Management Systems

***Source**: Study, 2024*

From the Table 4.13, the value of R^2 is 0.158 shows that perceived ease of use explains up to 15.8% of variance in Adoption of e-government Project Management Systems by Contractors in Nairobi County. From the ANOVA results, the significance of the model has a value F (1, 213) =39.712, P=0.000. This implies that perceived ease of use is a useful predictor of Adoption of e-government Project Management Systems by Contractors in Nairobi County. The unstandardized regression coefficient value of perceived ease of use is 0.302 and significance level of p=0.000. This indicated that a unit change in perceived ease of use would result to significant change in Adoption of e-government Project Management Systems by Contractors in Nairobi County by 0.302 units, P<0.01. Hence, there exists a positive and significant influence of perceived ease of use on Adoption of e-government Project Management Systems by Contractors in Nairobi County. The simple linear regression equation is as shown below:

Adoption of e-government PMS (Y) = 2.655+0.302(X_1) Perceived ease of use.

4.6.2.2 Influence of Perceived usefulness on Adoption of e-government Project Managements Systems

The second objective of the study was to established the effects of Perceived Usefulness on adoption of e-government Project Management Systems by Contractors. The results are as shown in Table 4.14.

Table 4.12: Regression Results of Perceived usefulness and Adoption of e-government Project Management Systems by Contractors

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	Sig. F Change
1	.663[a]	.440	.437	.59671	.440	166.622	1	212	.000

a. Predictors: (Constant), Perceived usefulness

b. Dependent Variable: Adoption of e-government Project Management Systems by Contractors in Nairobi County

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	59.328	1	59.328	166.622	.000[b]
	Residual	75.485	212	.356		
	Total	134.813	213			

a. Dependent Variable: Adoption of e-government Project Management Systems by Contractors in Nairobi County

b. Predictors: (Constant), Perceived usefulness

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.510	.181		8.358	.000
	Perceived usefulness	.614	.048	.663	12.908	.000

a. Dependent Variable: Adoption of e-government Project Management Systems by Contractors in Nairobi County

***Source**: Study, 2024*

From the Table 4.14, the value of R^2 is 0.440 reveals that up to 44.0% of change in Adoption of e-government Project Management Systems by Contractors in Nairobi County is accounted for by perceived usefulness. From the ANOVA table, the significance of the model has a value F (1, 213) =59.328, P=0.000. This postulates that perceived usefulness is a significant predictor of Adoption of e-government Project Management Systems by Contractors in Nairobi County (P<0.01). The unstandardized regression coefficient value of Perceived usefulness is 0.614 and significance level of p=0.000. This implies that a unit change in perceived usefulness would result to significant change in Adoption of e-government Project Management Systems by Contractors in Nairobi County by 0.614 (P<0.01). Therefore, there exists a positive and significant influence of Perceived usefulness on Adoption of e-government Project Management Systems by Contractors in Nairobi County. The simple linear regression equation is as shown below:

Adoption of e-government PMS (Y) = 1.510+0.614(X_2) Perceived usefulness.

4.6.2.3 Influence of Social norm on Adoption of e-government Project Management Systems by Contractors in Nairobi County

The third objective of the study was to evaluate the effects of Facilitating Conditions on e-government Project Management Systems on Adoptions by Contractors. The results are as shown in Table 4.15.

Table 4.13: Regression Results of Social norm and Adoption of e-government Project Management Systems by Contractors in Nairobi County

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.509[a]	.259	.255	.68645	.259	74.096	1	212	.000

a. Predictors: (Constant), Social norm

b. Dependent Variable: Adoption of e-government Project Management Systems

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	34.915	1	34.915	74.096	.000[b]
	Residual	99.898	212	.471		
	Total	134.813	213			

a. Dependent Variable: Adoption of e-government Project Management Systems

b. Predictors: (Constant), Social norm

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.797	.124		22.593	.000
	Facilitating Conditions	.296	.034	.509	8.608	.000

a. Dependent Variable: Adoption of e-government Project Management Systems

***Source**: Study, 2024*

From the Table 4.15, the value of R^2 is 0.259 shows that social norm explains up to 25.9% of variance in Adoption of e-government Project Management Systems by Contractors in Nairobi County. From the ANOVA results, the significance of the model has a value F (1, 213) =74.096, P=0.000. This implies that social norm is a useful predictor of Adoption of e-government Project Management Systems by Contractors in Nairobi County. The unstandardized regression coefficient value of social norm is 0.296 and significance level of p=0.000. This indicated that a unit change in social norm would result to significant change in Adoption of e-government Project Management Systems by Contractors in Nairobi County by 0.296 units (P<0.01). Hence, there exists a positive and significant influence of social norm on Adoption of e-government Project Management Systems by Contractors in Nairobi County. The simple linear regression equation is as shown below:

Adoption of e-government PMS (Y) = 2.797+0.296 (X_3) Social norm.

4.6.2.4 Influence of Facilitating conditions on Adoption of e-government Project Management Systems by Contractors in Nairobi County

The fourth objective of the study was to assess the effect of facilitating conditions on Adoption of e-government Project Management Systems by Contractors in Nairobi County. The results are as shown in Table 4.16.

Table 4.14: Regression Results of Facilitating conditions and Adoption of e-government Project Managements Systems

					Change Statistics			
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**R Square Change**	**F Change**	**df1**	**df2**	**Sig. F Change**
1	.572[a]	.327	.323	.65437	.327	102.831	1	212	.000

a. Predictors: (Constant), Facilitating conditions
b. Dependent Variable: Adoption of e-government Project Management Systems

ANOVA[a]

Model		**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	44.033	1	44.033	102.831	.000[b]
	Residual	90.780	212	.428		
	Total	134.813	213			

a. Dependent Variable: Adoption of e-government Project Management Systems
b. Predictors: (Constant), Facilitating conditions

Coefficients[a]

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.460	.138		17.843	.000
	Facilitating conditions	.378	.037	.572	10.141	.000

a. Dependent Variable: Adoption of e-government Project Management Systems

***Source**: Study, 2024*

From the Table 4.16, the value of R^2 is 0.327 reveals that up to 32.7% of change in Adoption of e-government Project Management Systems by Contractors in Nairobi County is accounted for by facilitating conditions. From the ANOVA results, the significance of the model has a value F (1, 213) =102.831, P=0.000. This postulates that facilitating conditions is a significant predictor of Adoption of e-government Project Management Systems by Contractors in Nairobi County. The unstandardized regression coefficient value of facilitating conditions is 0.378 and significance level of p=0.000. This implies that a unit change in facilitating conditions would result to significant change in Adoption of e-government Project Management Systems by Contractors in Nairobi County by 0.378 (P<0.05). Therefore, there exists a positive and significant influence of facilitating conditions on Adoption of e-government Project Management Systems by Contractors in Nairobi County. The simple linear regression equation is as shown below:

Adoption of e-government PMS (Y) = 2.460+0.378 (X_4) Facilitating conditions

4.6.3 Multiple Regression Analysis

Objective of this study sought to find out the extent that the extrinsic factor affected the adoption of NCA e-government project management system by the contractors in Nairobi, Kenya. This was achieved by carrying out standard multiple regression. The study was interested in knowing the effect of each of the extrinsic factor on adoption of e-government Project Managements Systems when all these constructs were entered as a block on the model. The results of multiple linear regression analysis were presented in Table 4.17 which contained model summary (R, R^2, Adj R^2) results, Table 4.18 which contained ANOVA (goodness of fit; F Ratio, Sig Value) while Table 4.19

contained regression coefficient (Unstandardized & standardized), t-value and Sig. value results.

Table 4.15: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	Sig. F Change
1	.839[a]	.703	.698	.43755	.703	123.789	4	209	.000

a. Predictors: (Constant), Facilitating Conditions, Social Norm, perceived usefulness, Perceived ease of use

b. Dependent Variable: Adoption of e-government Project Managements Systems

***Source**: Study, 2024*

The results from the model summary in Table 4.16 give us information on the overall summary of the model. Looking at the R square column, we can deduce that extrinsic factor account for 64.5% significant variance in Adoption of e-government Project Managements Systems (R square =.703, P=0.000) implying that 29.3% of the variance in adoption of e-government Project Managements Systems is accounted for by other variables not captured in this model.

Table 4.16: Model of Fit (ANOVA Table)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	94.799	4	23.700	123.789	.000[b]
	Residual	40.014	209	.191		
	Total	134.813	213			

a. Dependent Variable: Adoption of e-government Project Managements Systems

b. Predictors: (Constant), Facilitating Conditions, Social Norm, Perceived usefulness, Perceived ease of use

***Source**: Study, 2024*

Instead of utilizing the mean score, which was regarded to be a guess, the research resorted to the F Ratio in order to evaluate the significance of the model. This was done in order to determine if the study model was a more significant predictor of the adoption of e-government project management systems. According to the findings of the research, the F value represents the percentage of the improvement in forecasting the outcomes that could be attributed to fitting the model in comparison to the amount of inaccuracy or mistakes that were still present in the study model. From the findings, the F value was more than one, as indicated by a value of F=123.789, which meant that enhancement as a result of model fitting was much larger than the model errors/inaccuracies that were not used in the model (F (4,213) = 123.789, P=0.000). The large F value was very unlikely to exist by chance (99.0%), thus implying that the final study model had significant improvement in it is prediction ability of e-government Project Management Systems on Adoptions by Contractors.

Unstandardized coefficients, standardized coefficients, the t statistic, and significant values were all shown in Table 4.19 where they were provided. Depending on the kind of data being analyzed, the research presents the possibility of using either Unstandardized Coefficients or Standardized Coefficients. We wanted to examine the effects of extrinsic factors across the same measurements (Likert Scale 1 through 5), hence the research employed a column of coefficients that was not standardized.

Table 4.17: **Regression Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.010	.182		-.056	.956
	Perceived ease of use	.192	.033	.253	5.878	.000
	Perceived usefulness	.372	.042	.402	8.957	.000
	Facilitating Conditions	.254	.037	.297	6.897	.000
	Social Norm	.215	.029	.325	7.370	.000

a. Dependent Variable: Adoption of e-government Project Managements Systems

***Source**: Study, 2024*

From the findings presented in Table 4.19, we looked at the model results and scan down through the unstandardized coefficients B column. All extrinsic factor had significant effect on the Adoption of e-government Project Managements Systems. If extrinsic factor were held at zero or it was absent, the adoption of e-government project management system by Contractors would be -0.010, p=0.956, negative and insignificant. It was revealed that perceived ease of use had unique significant contribution to the model with B=.192, p=.000 suggesting that controlling of other variables (Perceived usefulness, Facilitating Conditions and Social Norm) in the model, a unit increase in perceived ease of use would result to significant increase in adoption of e-government Project Managements Systems by 0.192 units.

The coefficient of Perceived usefulness was 0.372, which was significant (p=.000) and also positive. When the variance explained by all other variables (Perceived ease of use, Facilitating Conditions and Social Norm) in the model was controlled, a unit increase in Perceived usefulness would result to increase in performance by 0.372 units.

Another variable that also had a unique significant contribution to the model was the value for Facilitating Conditions (B=.254, p=.000). When other variables in the model were controlled (Perceived usefulness, Perceived ease of use and Social Norm), a unit increase in Facilitating Conditions would result to significant increase in performance by 0.254 units.

Lastly, Social Norm had also unique significant contribution to the model with B=0.215, p=.015 implying that when other variables in the model were controlled (Perceived usefulness, Facilitating Conditions and Perceived ease of use), a unit increase in Social Norm would result to significant increase in performance by 0.215 units.

A regression of the four predictor variables against Adoption of e-government Project Managements Systems established the multiple linear regression model as below as indicated in Table 4.18:

$$\mathbf{Y = 0.010 + 0.192X_1 + 0.372X_2 + 0.254X_3 + 0.215X_4}$$

Where;

Y= Adoption of e-government Project Managements Systems

$\mathbf{X_1}$= Independent variable 1 [perceived ease of use]

$\mathbf{X_2}$= Independent variable 2 [perceived usefulness]

$\mathbf{X_3}$= Independent variable 3 [social norm]

$\mathbf{X_4}$= Independent variable 4 [facilitating conditions]

4.6.4 Testing Hypotheses

The hypotheses testing was based on Table 4.19 which regression coefficient results for multiple linear regression analysis. This was arrived by using significance level of unstandardized B coefficient. The significance level was set at P<0.05; therefore, B coefficient which had significance level less than 0.05 was considered significant and therefore, the alternate hypothesis was accepted.

H_{A1}: perceived ease of use positively affects Adoption of e-government Project Management Systems by Contractors.

B Coefficient results: (B_1 = 0.192; p=0.000< 0.05)

Verdict: The alternate hypothesis **H_{A1}** was accepted.

Results interpretation: H_{A1}: perceived ease of use positively affects Adoption of e-government Project Management Systems by Contractors.

H_{A2}: perceived usefulness positively affects Adoption e-government Project Management Systems by Contractors.

B Coefficients results: (B_2 = 372; p=0.000< 0.05)

Verdict: The alternate hypothesis **H_{A2}** was accepted.

Results interpretation: H_{A2}: perceived usefulness positively affects Adoption e-government Project Management Systems by Contractors.

H_{A3}: Social norm positively affects Adoption of e-government Project Managements Systems by Contractors.

B Coefficient results: (B_3 = 0.254; p=0.000< 0.01)

Verdict: The alternate hypothesis **H_{A3}** was accepted.

Results interpretation: H_{A3}: social norm positively affects Adoption of e-government Project Managements Systems by Contractors.

H_{A4}: Facilitating conditions positively affect Adoption of e-government Project Managements Systems by Contractors.

B Coefficient results: (B_4= 0.215; p=0.000< 0.05)

Verdict: The alternate hypothesis **H_{A4}** was accepted.

Results interpretation: H_{A4}: Facilitating conditions positively affect Adoption of e-government Project Managements Systems by Contractors.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study objective was to find out the extent that the factors that affected the adoption of NCA e-government project management system by the contractors in Nairobi, Kenya. From this overall objective, the specific objectives aimed at achieving the effect of perceived ease of use, perceived usefulness, social norm and facilitating conditions on adoption of e-government Project Management Systems by Contractors in Nairobi County. This chapter presents the summary of major findings of the study, the conclusions, and recommendations and finally, the chapter highlighted areas for further research.

5.2 Discussion of Findings

5.2.1 First Specific Objective

The first specific objective of the study was to established effects of Perceived Ease on adoption of e-government Project Management Systems by Contractors. The simple linear regression analysis demonstrated a significant relationship between the adoption of e-government Project Management Systems by contractors in Nairobi County and the perceived ease of use. This finding suggested that as the perceived ease of use increases, the likelihood of adopting the systems also increases. Moreover, in the multiple linear regression analysis, unstandardized beta coefficients affirm a positive and significant impact of perceived ease of use on the adoption of e-government Project Management Systems. Contractors in Nairobi County are more likely to adopt these systems when they perceive them as user-friendly. This underscores the importance of

enhancing the user-friendliness of such systems to promote their effective adoption and utilization among contractors in the region.

The Technology Acceptance Model (TAM) was a theoretical framework widely employed to understand and predict users' acceptance and adoption of new technologies. In the context of e-government Project Management Systems (e-GPMS) adoption by contractors, TAM becomes a valuable lens for analysis. One critical component of TAM is "Perceived Ease of Use," emphasizing users' subjective assessment of the system's usability and simplicity. A high level of Perceived Ease of Use positively influenced contractors' attitudes toward e-GPMS, fostering a favourable environment for adoption. When these systems aligned with users' expectations of simplicity and accessibility, it resulted in increased acceptance and engagement. This facet of TAM highlights the significance of user-centric design and effective training programs to enhance the perceived ease of use, ultimately catalyzing the successful integration of e-GPMS into the construction industry. As contractors perceive these systems as more user-friendly, the barriers to entry diminish, and the potential for widespread adoption within the construction sector was heightened.

Munyoka (2020) suggested that an individual’s perception of a system as ease to use or requiring less effort to achieve a task was determined by several factors; the main one being one’s level of education, previous experience in using related systems and one’s motivation. The positive significant effect of perceived ease of use was supported by various studies. Zaman (2020) indicates that a statistically significant relationship exists between perceived ease of use (PEOU), perceived usefulness (PU) and end user acceptance. Moreover, the results showed that ERP system adoption significantly

mediates the relationship between PEOU, PU and end user acceptance. Elmansori and Ishak (2021) indicated a significant positive effect of perceived ease of use, perceived usefulness, IT knowledge, privacy, and facilitating conditions on behavioural intention while the impact of security on behavioural intention was found an insignificant effect. Mensah *et al.,* (2018) indicate that perceived ease of use, perceived service quality, trust, and language were significant in determining the willingness to use e-government services. Verkijika and De Wet (2018) showed that the usability of e-government websites was positively associated with the E-Government Development Index (EGDI) and the E-Participation Index (EPI).

5.2.2 Second Specific Objective

The second specific objective of the study was to establish the effects of Perceived Usefulness on adoption of e-government Project Management Systems by Contractors. The simple linear regression analysis highlights a significant relationship between changes in the adoption of e-government Project Management Systems by contractors in Nairobi County and perceived usefulness. This implies that as perceived usefulness increases, it becomes a noteworthy predictor of adoption. The multiple linear regression analysis, utilizing unstandardized beta coefficients, reinforces this by revealing a significant positive influence of perceived usefulness on the adoption of e-government Project Management Systems. The values of B and P provide substantial evidence to accept the second alternate hypothesis, indicating that perceived usefulness significantly affects the adoption of these systems by contractors in Nairobi County. Recognizing and enhancing the perceived usefulness of these systems was crucial for promoting their successful adoption among contractors in the region.

The Technology Acceptance Model (TAM) was a well-established framework for understanding users' acceptance and adoption of new technologies. In the context of e-government Project Management Systems (e-GPMS) adoption by contractors, TAM provides valuable insights, with "Perceived Usefulness" playing a pivotal role. Perceived Usefulness, a core element of TAM, refers to users' subjective assessment of how a particular technology can enhance their performance and productivity. For contractors, the perceived usefulness of e-GPMS was instrumental in shaping their attitudes and decisions regarding adoption. When contractors believe that these systems contribute significantly to their work efficiency, task accomplishment, and overall professional effectiveness in the construction industry, the likelihood of adoption increases. Contractors were more inclined to embrace e-GPMS when they perceive them as valuable tools that positively impact their work outcomes. The perceived usefulness of these systems acts as a driving force, motivating contractors to integrate them into their project management processes.

Li and Shang (2020) revealed that the concept of e-government service quality has eight contributing dimensions: system quality, reliability, security, accessibility, information quality, service capability, interactivity, and responsiveness. Perceived service value is a powerful mediator between service quality and citizens' continuous-use intention. The intention to use is a consequence of service quality, service value, and satisfaction. Mohammad, Ebrahimzadeh, Sargolzae and Sepasgozar (2020) confirmed the direct impact of "perceived usefulness" and "perceived ease of use" towards user attitudes. In addition, results show that "attitude" and "perceived usefulness" have a direct impact on the development of usage intention in customers Wairiuko, Nyonje and Omulo (2018) found that ICT infrastructure had a strong positive influence on adoption of E-

government. Thus, the study concludes that ICT infrastructure has a significant influence on the adoption of E-government in the County Government of Kajiado.

5.2.3 Third Specific Objective

The third specific objective of the study was to evaluate the effects of Facilitating Conditions on e-government Project Management Systems on Adoptions by Contractors. The simple linear regression analysis indicated a substantial connection between changes in the adoption of e-government Project Management Systems by contractors in Nairobi County and social norms. This suggested that social norms play a significant role in predicting the adoption of these systems. The multiple linear regression analysis, utilizing unstandardized beta coefficients, further supports this by demonstrating a notable positive influence of social norms on the adoption of e-government Project Management Systems. The values of B and P provide conclusive evidence to support the third alternate hypothesis, affirming that social norms significantly impact the adoption of these systems by contractors in Nairobi County. Acknowledging and leveraging the influence of social norms was essential for fostering successful adoption of e-government Project Management Systems among contractors in the region.

The Unified Theory of Acceptance and Use of Technology (UTAUT) was a comprehensive model that explores factors influencing technology adoption. In the realm of e-government Project Management Systems (e-GPMS) adoption by contractors, UTAUT emphasizes the critical role of facilitating conditions. These conditions, encompassing resource availability, system compatibility, reliable support, accessibility, and skills, significantly impact adoption. To enhance e-GPMS adoption,

stakeholders must focus on addressing these facilitating conditions, ensuring that contractors have the necessary resources, compatible technologies, reliable support systems, easy accessibility, and requisite skills. A holistic approach to facilitating conditions, as advocated by UTAUT, fosters a conducive environment for successful e-GPMS adoption in the contractor community.

Facilitating conditions was confirmed as a strong predictor of intention to use e-government systems. Bamufleh *et al.,* (2021) showed that PEOU, PU, ATT, TR, IQ, FC, and SI have positive effects on behavioral intentions. Mensah (2020) indicated that political trust was a significant predictor of the intention to use e-government services. The results also demonstrated that whilst political trust was not significant in predicting the perceived usefulness of e-government services, it was significant in determining the perceived ease of use of e-government services. Li and Xue (2021) showed that trust in government, trust in the internet, service quality, and information quality have positive effects on citizens' post-use trust. Factors that do not determine a user's post-use trust are the perception of privacy and security, as well as system quality. Another finding was that citizens' post-use trust does not directly influence their continuous intention to use e-government. Mensah and Mwakapesa (2023) revealed that both effort expectancy and facilitating conditions significantly drive the intention to use and recommend the adoption of e-government services. Also, e-government information quality dimensions such as availability, objectivity, utility, confidentiality, and integrity were all found to positively drive the intention to use e-government services. Additionally, people's intention to use e-government was significant in driving the recommendation behavior of e-government services to others.

5.2.4 Fourth Specific Objective

The study's fourth objective focused on evaluating the impact of social norms on the adoption of e-government Project Management Systems by contractors, testing the alternate hypothesis that facilitating conditions positively influence this adoption. The results depict a varied perception among respondents concerning resources and compatibility with e-government project management systems. While a considerable number agree on having necessary resources and system compatibility, others express disagreement or uncertainty. Respondents also differ in their confidence regarding assistance from the National Construction Authority (NCA) when facing challenges with the system, highlighting diverse perspectives and challenges related to resource adequacy, system reliability, accessibility, and skill readiness. The statistical analyses, including simple linear regression and multiple linear regression, affirm that facilitating conditions significantly explain and positively influence the adoption of e-government Project Management Systems by contractors in Nairobi County. These findings underscore the multifaceted nature of considerations in adopting such technologies.

The Unified Theory of Acceptance and Use of Technology (UTAUT), Theory of Reasoned Action (TRA), and Theory of Planned Behaviour (TPB) offer a comprehensive lens to examine the influence of social norms on the adoption of e-government Project Management Systems (e-GPMS) by contractors. UTAUT integrates performance expectancy, effort expectancy, and social influence, emphasizing the role of social norms in shaping behavioral intentions. TRA underscores the impact of subjective norms, focusing on the perceived social pressure to adopt. TPB extends TRA by including perceived behavioral control. In the context of e-GPMS adoption, these theories collectively highlight the significance of social

norms, emphasizing the influence of senior professionals, friends, colleagues, and industry bodies on contractors' decisions. Aligning e-GPMS adoption strategies with these theories can involve creating awareness, leveraging positive testimonials, and fostering a supportive social environment. Understanding the interplay between these psychological factors aids in developing targeted interventions that enhance the positive perception of e-GPMS among contractors, fostering a culture of acceptance and regular usage within the construction industry.

The results were supported by Soong, Ahmed and Tan (2020) who confirmed that effort expectancy, performance expectancy and social influences had a direct effect on the adoption of EGP in the private sector. Afieroho, Perkins, Zhou, Hoanca and Protasel (2023) showed that performance expectancy, facilitating conditions, social influence, and effort expectancy significantly and positively affect behavioral intention to adopt e-government tools to monitor PIPs execution in Nigeria. Zhao, Ahn and Manoharan (2021) revealed that e-government development had a weak and positive impact on the corruption levels across all countries but varied according to the different cultural factors. Based on the cultural typology of the Globe project, the authors found that e-government development was more effective in reducing corruption in countries with certain cultural characteristics. Cultures that put less emphasis on controlling uncertainty shared power more equally among members, valued individualism, and focused more on future development were more favorable to e-government development than others.

The results were further supported that Zahid and Haji Din (2019) indicated that trust and its antecedents (economic bonds, social bonds, and structural bonds), attitude and

its antecedents (performance expectancy, effort expectancy), subjective norms and their antecedents (mass media influence, family influence), perceived behavioral control and its antecedents (self-efficacy) have significant and positive effect on intention. However, perceived risk and facilitating condition have insignificant influence on attitude and perceived behavioral control, respectively.

5.3 Summary of the Major Findings

The data for the findings of this study was collected using questionnaires from 214 respondents. The specific objectives of the study were achieved through conducting multiple linear regression analysis thereby establishing R square and B coefficients. These analyses were conducted at 95.0% confidence level ($P<0.05$). The major findings are as follows:

5.3.1 Influence of Perceived ease of use on Adoption of e-government Project Managements Systems

H_{A1}: perceived ease of use positively affects Adoption of e-government Project Management Systems by Contractors.

B Coefficient results: ($B_1 = 0.192$; $p=0.000< 0.05$)

Verdict: The alternate hypothesis **H_{A1}** was accepted.

Results interpretation: H_{A1}: perceived ease of use positively affects Adoption of e-government Project Management Systems by Contractors.

The first objective of the study was established effects of Perceived Ease on adoption of e-government Project Management Systems by Contractors. The study sought to test the first alternate hypothesis which was perceived ease of use positively affect Adoption of e-government Project Management Systems by Contractors. The respondents

exhibited a varied perception of their interaction with the e-government project management systems. While a significant portion found the interaction to be clear and understandable, with over half strongly agreeing, there were notable proportions expressing neutral and dissenting views. The ease of acquiring proficiency in using the systems and the overall user-friendliness garnered mixed responses. A considerable number agreed that the e-government project management system was easy to use, yet a notable percentage found learning to operate these systems challenging. Flexibility in interaction was acknowledged by a substantial portion, but again, diverse opinions emerged regarding the ease of getting the systems to perform desired tasks. These findings collectively underscore the nuanced user experiences and perspectives on the clarity, ease, and flexibility of e-government project management systems.

Simple linear regression analysis revealed that Adoption of e-government Project Management Systems by Contractors in Nairobi County was significantly explained by perceived ease of use. Therefore, perceived ease of use is significant predictor of Adoption of e-government Project Management Systems by Contractors in Nairobi County. Multiple linear regression results using unstandardized beta coefficients showed that there exists a positive and significant effect of perceived ease of use on Adoption of e-government Project Management Systems by Contractors in Nairobi County. Therefore, the first alternate hypothesis was accepted as perceived ease of use has significant effect on Adoption of e-government Project Management Systems by Contractors in Nairobi County.

5.3.2 Influence of Perceived usefulness on Adoption of e-government Project Managements Systems

H_{A2}: perceived usefulness positively affects Adoption e-government Project Management Systems by Contractors.

B Coefficients results: ($B_2 = 372$; $p=0.000< 0.05$)

Verdict: The alternate hypothesis **H_{A2}** was accepted.

Results interpretation: H_{A2}: perceived usefulness positively affects Adoption e-government Project Management Systems by Contractors.

The second objective of the study was to establish the effects of Perceived Usefulness on adoption of e-government Project Management Systems by Contractors. The study sought to test the second alternate hypothesis which was perceived usefulness positively affect Adoption e-government Project Management Systems by Contractors. Respondents generally perceived the e-government project management systems as useful in their professional practices, with a notable majority agreeing or strongly agreeing. The systems were acknowledged for enabling efficient task accomplishment and contributing to increased practice productivity. The belief in the potential to enhance results through system usage was prevalent among the participants. Additionally, a substantial portion acknowledged the systems' positive impact on their effectiveness in the construction industry, emphasizing the perception that the e-government project management systems simplify tasks and provide more strategic opportunities. These findings collectively highlight the perceived utility and positive contributions of the systems to professional practices.

Simple linear regression analysis revealed changes in the adoption of e-government Project Management Systems by Contractors in Nairobi County was significantly accounted for by perceived usefulness. Therefore, perceived usefulness was significant predictor of Adoption of e-government Project Management Systems by Contractors in Nairobi County. Multiple linear regression results using unstandardized beta coefficients showed that perceived usefulness has significant positive influence on Adoption of e-government Project Management Systems by Contractors in Nairobi County. Basing on the values of B and P, there was adequate evident to accept second alternate hypothesis as Perceived usefulness has significant effect on Adoption of e-government Project Management Systems by Contractors in Nairobi County.

5.3.3 Influence of Social norm on Adoption of e-government Project Managements Systems

H_{A3}: Social norm positively affects Adoption of e-government Project Managements Systems by Contractors.

B Coefficient results: ($B_3 = 0.254$; $p=0.000< 0.01$)

Verdict: The alternate hypothesis **H_{A3}** was accepted.

Results interpretation: H_{A3}: social norm positively affects Adoption of e-government Project Managements Systems by Contractors.

The third objective of the study was to evaluate the effects of Facilitating Conditions on e-government Project Management Systems on Adoptions by Contractors. The study sought to test the third alternate hypothesis which was social norm positively affect Adoption of e-government Project Managements Systems by Contractors. Respondents exhibited varying levels of agreement regarding the perceived support and

encouragement from different groups for using e-government project management systems. While a notable proportion acknowledged the helpfulness and endorsement from seniors, friends, contractors, and clients in adopting these systems, there were variations in responses. Additionally, the participants expressed a favourable intention to adopt and regularly use the e-Government Project Management System, indicating a positive inclination toward sustained utilization. These findings suggest a nuanced landscape of support and intentions among the surveyed professionals, emphasizing the role of diverse stakeholders in influencing the adoption of e-government project management systems.

Simple linear regression analysis revealed that changes in the adoption of e-government Project Management Systems by Contractors in Nairobi County are significantly accounted for by social norm. Hence, Adoption of e-government Project Management Systems by Contractors in Nairobi County is significantly predicted by social norm. Multiple linear regression results using unstandardized beta coefficients showed that social norm has significant positive influence on Adoption of e-government Project Management Systems by Contractors in Nairobi County. Basing on the values of B and P, the study failed to reject the third alternate hypothesis as social norm has significant effect on Adoption of e-government Project Management Systems by Contractors in Nairobi County.

5.3.4 Influence of Facilitating conditions on Adoption of e-government Project Management Systems by Contractors in Nairobi County

H_{A4}: Facilitating conditions positively affect Adoption of e-government Project Managements Systems by Contractors.

B Coefficient results: (B_4= 0.215; p=0.000< 0.05)

Verdict: The alternate hypothesis $\mathbf{H_{A4}}$ was accepted.

Results interpretation: $\mathbf{H_{A4}}$: Facilitating conditions positively affect Adoption of e-government Project Managements Systems by Contractors.

The fourth objective of the study was to assess the effects of Social Norm on e-government Project Management Systems on Adoption by Contractors. The study sought to test the fourth alternate hypothesis which was facilitating conditions positively affect Adoption of e-government Project Managements Systems by Contractors. The study reflects a mixed perception among respondents regarding the resources and compatibility associated with e-government project management systems. While a substantial proportion expressed agreement on having the necessary resources and system compatibility, there were contrasting opinions, with notable respondents expressing disagreement or uncertainty. Additionally, respondents indicated varying levels of confidence in obtaining assistance from the National Construction Authority (NCA) when facing challenges with the e-government project management system. The findings underscore the diverse perspectives and challenges associated with resource adequacy, system reliability, accessibility, and skill readiness, emphasizing the multifaceted nature of considerations in adopting these technologies.

Simple linear regression analysis revealed that variation in the adoption of e-government Project Management Systems by Contractors in Nairobi County is significantly explained by facilitating conditions. Hence, facilitating conditions is useful predictor of Adoption of e-government Project Management Systems by Contractors in Nairobi County. Multiple linear regression results using unstandardized beta coefficients showed that facilitating conditions has significant positive influence

on Adoption of e-government Project Management Systems by Contractors in Nairobi County. Basing on the values of B and P, there was adequate evident to accept fourth alternate hypothesis as facilitating conditions has significant effect on Adoption of e-government Project Management Systems by Contractors in Nairobi County.

5.4 Conclusions

This implies that increase in the perceived ease of use of e-GPMS would results to improvement in its adoption among Contractors in Nairobi County. Contractors find e-government Project Management Systems (e-GPMS) to have mixed perceptions regarding ease of use. While some express clarity and understanding in their interactions, others struggle with the system's complexity, indicating varied experiences in becoming skilful and navigating its features. The findings highlighted a nuanced perspective on the perceived ease of use, influencing contractors' adoption decisions.

Contractors perceive e-government Project Management Systems (e-GPMS) as instrumental in their practice, finding them beneficial in enhancing productivity, task efficiency, and overall professional effectiveness in the construction industry. The positive perceptions of e-GPMS's usefulness suggest its potential as a valuable tool for contractors seeking improved outcomes and streamlined project management processes.

The findings underscore the pivotal role of social norms in shaping contractors' perceptions of e-government Project Management Systems (e-GPMS). Positive influence from seniors, friends, colleagues, and professional bodies significantly contributes to a favourable environment, fostering an inclination towards adopting and

regularly utilizing the e-GPMS within the construction industry. Resource limitations, perceived incompatibility with existing technologies, unreliable system support, and accessibility concerns pose significant obstacles to the adoption of e-GPMS. Addressing these facets is imperative to facilitate a smoother and more widespread adoption of e-GPMS within the contractor community.

5.5 Recommendations

The recommendations were based on policy and practice in the construction industry from the study.

5.5.1 Recommendation for Policy

From the study, there is need for the government to allocate more funds for training of contractors on the e-GPMS to build their capacity to fully utilized the system allocated for managing the construction industry.

The policy of funding of the ICT infrastructure and digitalization of the public sector to support the availability of an effective system rollout of the e-GPMS in the construction industry.

5.5.2 Recommendation for Practice

From the study, we recommend a full implementation of e-GPMS in the construction industry to improve on productive, efficiency and overall professional effectiveness in the industry. It will enhance outcomes and streamline processes.

5.6 Areas for Further Research

The general objective of this study was to find out the extent that the extrinsic factor affected the adoption of NCA e-government project management system by the contractors in Nairobi, Kenya. Specifically, this study concentrated on the relationships that the Perceived ease of use, Perceived usefulness, Facilitating Conditions and Social Norm had on the Adoption of e-government Project Managements Systems. The independent variables studied are definitely not exhaustive and hence further research could be carried out to unearth other extrinsic factor that can be applied to enhance adoption of e-GPMS. This includes government policies and regulations, data security and privacy.

The study confines itself only to the registered contractors from category 4 as per 2021 Register. These contractors are based in Nairobi County. The study recommended that a study should be undertaken to cover all registered contractors from category 4 in Kenya.

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APPENDICES

Appendix I: Introduction Letter

Moses Ng'ong'a,
Africa Nazarene University,

School of Business,
Nairobi.

Date: ……

Dear Sir/Madam,

RE: INTRODUCTION

I am a student at Africa Nazarene University undertaking a MBA degree in Project Management. I am currently undertaking a research study entitled **FACTORS AFFECTING ADOPTION OF E-GOVERNMENT PROJECT MANAGEMENT SYSTEM BY CONTRACTORS IN NAIROBI".**

The study is expected to provide useful information that will be beneficial for improved Construction services delivery by NCA in Kenya.

You have been identified as one of the respondents to provide information for the study. This is therefore to request you to complete the questionnaire attached as honestly as possible. All information that you provide will be treated with utmost confidence and will be used for the purpose of this study only.

Thank you for your co-operation.

Yours faithfully,

Moses Ng'ong'a (Mr..)
MBA Student, School of Business
Africa Nazarene University

Appendix II: Questionnaire

SECTION 1: DEMOGRAPHIC INFORMATION

The following demographic information will be kept in the strictest confidence and will never be reported individually or associated in any way with your survey information.

D1 Age:[01] Below 25 years [02] 26-30 years [03] 31-35 years [04] 36-40 years [05]Above 40 years.

D2 Gender : [01] male [02] Female

D3 Nationality: Kenya [ ] Rest of Africa [ ] Europe[ ] USA[ ]

Middle East [ ] Asia [ ] Other (Specify).....

D4 How long have you been using information communication technology?

[01] Below 1yr [02] 1-2 yrs [03] 2-3 yrs [04] 3-4 yrs [04] 4-5 yrs [05]

5 - 10 years [06] over 10 years

SECTION 2: INDEPENDENT VARIABLE

Please tick or circle the numbers as appropriate

Below are statements about you which you may agree or disagree. Using the response scale below, indicate your agreement or disagreement with each item.

Perceived Ease of Use (PEOU)

PEOU 1	My interaction with e-government project management systems is clear and understandable	1	2	3	4	5
PEOU 2	It was easy for me to become skilful at using at using the e-government project management systems	1	2	3	4	5
PEOU 3	I find the e-government project management system easy to use	1	2	3	4	5
PEOU 4	Learning to operate e-government management systems is easy for me	1	2	3	4	5
PEOU 5	I find e-government project management systems to be flexible to interact with	1	2	3	4	5
PEOU 6	I find it easy to get e-government management systems to do what I want to do	1	2	3	4	5

Perceived Usefulness PU

PU 1	I find the e-government project management systems useful in my practice	1	2	3	4	5
PU 2	Using the e-government project management systems enables me to accomplish tasks more quickly	1	2	3	4	5
PU 3	Using the e-government project management systems increase my practice productivity	1	2	3	4	5
PU 4	If I use the e-government project management systems, I will increase my chances of getting good results in my practice	1	2	3	4	5
PU 5	Using e-government project management systems enhance my effectiveness in construction industry	1	2	3	4	5
PU 6	The e-government project management system simplifies and automates repetitive tasks, freeing up my time for more strategic activities.					

Social Norm SN

SN 1	My seniors in construction and friends are helpful using E-government project management systems	1	2	3	4	5
SN 2	Friends think I should use e-government project management system	1	2	3	4	5
SN 3	My contractors in the same category think I should use e-government project management systems	1	2	3	4	5
SN 4	My clients and category below me think I should use e-government project management systems	1	2	3	4	5

SN 5	My professional body in my practise think I should use e-government project management systems	1	2	3	4	5
SN6	I have strong intention to adopt and regularly use the e-Government Project Management System					

Facilitating Conditions

FC 1	I have the resources necessary to use e-government project management system	1	2	3	4	5
FC 2	e-government project management systems are compatible with other technologies I use	1	2	3	4	5
FC 3	I can get help from NCA when I have difficulties using e-government project management system	1	2	3	4	5
FC 4	The e-government project management systems are reliable and I can get all the information that I need to use	1	2	3	4	5
FC 5	The e-government project management systems facilities are easily accessible to me	1	2	3	4	5
FC 6	I have requisite skills and technology to use e-government project management system					

SECTION 3: DEPENDENT VARIABLE

Below are statements about you which you may agree or disagree. Using the response scale below, indicate your agreement or disagreement with each item.

ADOPTION OF E-GOVERNMENT PROJECT MANAGEMENT SYSTEM (AEP)

AEP 1	I am satisfied with the integration of the e-GPMS with other government services	1	2	3	4	5
AEP 2	I explore and leverage new features as they become available	1	2	3	4	5
AEP 3	I have explored and utilized a variety of services offered by the system, such as document sharing, collaboration tools, or reporting features?	1	2	3	4	5
AEP4	I explore additional modules or features beyond the basic project management tools offered by the system	1	2	3	4	5
AEP5	I am satisfied with the system's user interface and ease of navigation					
AEP6	I frequently log in to the system to access project-related information or perform tasks					

I greatly appreciate you taking time to fill and return this survey.

Thank you very much.

Moses Ng'ong'a

Appendix III: NACOSTI Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **679462**

Date of Issue: **18/January/2024**

RESEARCH LICENSE



This is to Certify that Dr.. MOSES ONYANGO NGONGA of Africa Nazarene University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: THE EFFECTS OF EXTRINSIC FACTORS ON ADOPTION OF E-GOVERNMENT PROJECT MANAGEMENT SYSTEM BY CONTRACTORS, A CASE OF NATIONAL CONSTRUCTION AUTHORITY (NCA), NAIROBI KENYA for the period ending : 18/January/2025.

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CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
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3. The License is valid for the proposed research, location and specified period.
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5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
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13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix IV: Estimated Research Budget

MATERIALS	RATE	QUANTITY	COST (SHS)
Data collection			10,000.00
Laptop	@40,000	1	40,000.00
Foolscaps Ruled	@ 500	1 ream	500.00
Photocopy papers	@ 600	3 Reams	1,800.00
Travelling Cost			20,000.00
Printer	@ 1	1 piece	15,000.00
Internet Cost			15,000.00
Pens	@20	4	80.00
Miscellaneous			10,000.00
Total			**112,380.00**

Appendix V: Research Work Plan

Activity	TIME FRAME																				
	Jan 2020-Sept. 2020				Oct-Dec 2020			Jan—Feb 2021				May - Sept 2021				Oct-March 2023					
Proposal preparation																					
Proposal presentation																					
Incorporation of panel comments																					
Presentation of corrected proposal																					
Submission of corrected proposal to School																					
Pilot testing of questionnaire																					
Data collection																					
Data processing and analysis																					
Review of draft by supervisor																					
Incorporation of Supervisors comments																					
Supervisors Clear thesis																					
Intent to submit thesis																					
Defend thesis																					