The Digital Edge: Analyzing the Post-Implementation Effect of E-Procurement on Procurement Cycle Time in Selected Ethiopian Federal Institutions

By: Rakeb Ayalew GSD/9298/16

A Thesis Submitted to Addis Ababa University College of Business and Economics (CoBE) in partial fulfillment of the requirements for the Award of Master of Business Administration (MBA)

Addis Ababa University College of Business and Economics – MBA program

Advisor: Dr. Gemechis Terfa (PhD.)

June, 2026

Addis Ababa, Ethiopia

The Digital Edge: Analyzing the Post-Implementation Effect of E-Procurement on Procurement Cycle Time in Selected Ethiopian Federal Institutions

By: Rakeb Ayalew GSD/9298/16

Advisor: Dr. Gemechis Terfa (PhD.)

A Thesis Submitted to Addis Ababa University College of Business and Economics (CoBE) in partial fulfillment of the requirements for the Award of Master of Business Administration (MBA)

Addis Ababa University College of Business and Economics – MBA program

June, 2026

Addis Ababa, Ethiopia

DECLARATION

I, Rakeb Ayalew, hereby declare the submission of this thesis entitled "**The Digital Edge: Analyzing the Post-Implementation Effect of E-Procurement on Procurement Cycle Time in Selected Ethiopian Federal Institutions"** is my original work presented toward an award of Master of Business Administration. This study has not been submitted fully or partially to other degree or diploma program in Addis Ababa University or any other institution.

Name: Rakeb Ayalew



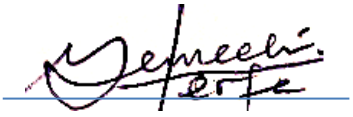
Signature: _____

Date: June 10, 2026

ADVISOR APPROVAL

This Thesis work on the topic entitled "**The Digital Edge: Analyzing the Post-Implementation Effect of E-Procurement on Procurement Cycle Time in Selected Ethiopian Federal Institutions"** was carried out under my guidance. I, hereby assure that her work is appropriate and standard enough to be submitted for the award of Master of Business administration in Management with my approval.

Name: Dr. Gemechis Terfa (PhD.)

Signature: 

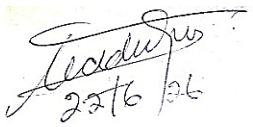
Date: June 10, 2026

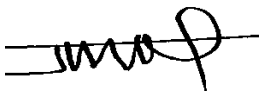
Addis Ababa University

Final Thesis Approval Sheet

We, the undersigned, members of the Board of Examiners, have read the thesis, evaluated the final open defense of the candidate and accepted the thesis has fulfilled the requirements.

Approved by Board of Examiners

Internal Examiner	Signature	Date
Assistant Professor Tewodros Wuhib		**22 / 06 / 2026**

External Examiner	Signature	Date
Dr. Jebessa Teshome (PhD.)		**19 / 06 / 2026**

This is to certify the thesis prepared by Rakeb Ayalew, entitled "The Digital Edge: Analyzing the Post-Implementation Effect of E-Procurement on Procurement Cycle Time in Selected Ethiopian Federal Institutions" and submitted to Addis Ababa University College of Business and Economics (CoBE), Department of Business Administration for partial fulfillment of the requirements for the Award of Master of Business Administration (MBA).

Graduate Program Coordinator	Signature	Date

Department Head	Signature	Date

ACKNOWLEDGMENTS

Above all, I would like to express my deepest gratitude to the Almighty God for his divine guidance throughout this study.

I would also like to thank my advisor Dr. Gemechis Terfa(PhD) for his continued guidance throughout this thesis. And special thanks to the system support staffs who helped me carryout the data collection, the federal institutions employees who were involved in various aspects of this study and the eGp users for their swift responses.

Finally, I am deeply thankful for my sister Lina Ayalew for her consistent support and my family, friends and class mates for their encouragement during the entire period of this study.

Contents

DECLARATION I
Final Thesis Approval Sheet II
ACKNOWLEDGMENTS III
List of Tables VIII
List of Figures VIII
Acronyms and Abbreviations IX
Abstract X
CHAPTER ONE 1
1. INTRODUCTION 1
1.1. Overview 1
1.2. Background of the Study 1
1.3. Statement of the Problem 3
1.4. Research Questions 5
1.5. Objective of the Study 5
1.5.1. General Objective 5
1.5.2. Specific Objective 5
1.6. Research Gap 6
1.7. Significance of the Study 7
1.8. Scope of the Study 8
1.9. Limitations of the Study 9
1.10. Definition of Key Terms 10
1.11. Organization of the Thesis 12
CHAPTER 2 12
2. LITERATURE REVIEW 12
2.1. Theoretical Framework 13
2.1.1. Resource-Based View (RBV) & eGp system Capabilities 13
2.1.2. Transaction Cost Economics (TCE) & Cost Minimization 15
2.2. Conceptual Literature Review 16
2.2.1. Procurement cycle time and operational performance measurement 16
2.2.2. The Role of Technology in E-Procurement Efficiency 18
2.2.3. Conceptual Framework of Electronic Government Procurement (eGp) 19

2.2.4. E-Planning & Procurement Cycle Efficiency 20
2.2.5. E-Tendering and Procurement Cycle Efficiency 21
2.2.6. E-Purchasing and Procurement Cycle Efficiency 22
2.2.7. Supplier Management and Registration 22
2.2.8. E-Procurement modules, methods and thresholds 23
2.3. Empirical Literature Review 23
2.3.1. The traditional procurement process standard and inefficiencies 24
2.3.2. Comparative analysis and Expected benefits of eGp 25
2.3.2.1. Regulatory Evolution of Procurement Cycle Time Standards 26
2.3.3. Procurement cycle challenges 26
2.3.4. Risks, Challenges, and Mitigating Strategies 27
2.3.4.1. Barriers to E-Procurement system effective implementation 27
2.3.4.2. Strategies to enhance the procurement cycle 28
2.4. Conceptual Framework Diagram 29
CHAPTER 3 31
3. RESEARCH METHODOLOGY 31
3.1. Introduction 31
3.2. Research Design and Approach 31
3.3. Population and Sampling Techniques 32
3.4. Variable Definition 33
3.4.1. Independent Variable: E-Procurement Module Utilization 33
3.4.2. Dependent Variable: Procurement Cycle Time (PCT) 33
3.4.3. Mediator Variable: Staff Competency 34
3.4.4. Moderator Variable: System Challenges 34
3.5. Data Collection Strategy 34
3.5.1. Questionnaire Structure 34
3.5.2. Data Sources 35
3.6. Data Analysis Plan 36
3.7. Data Validity and Reliability 36
3.8. Data Limitation and Quality 37
3.9. Ethical Considerations 38
CHAPTER 4 38

4.1 INTRODUCTION 38
4.2 Respondents Demographic profile 38
4.2.1. Response Rate 39
4.2.2. Institutional Role Distribution 39
4.2.3. Education 40
4.2.4. Professional Procurement Experience 40
4.2.5. Active eGp Professional Experience 40
4.2.6. Average eGp Transactions 40
4.2.7. Frequency of eGp Platform Usage 41
4.2.8. Perceived Percentage of Time Saved 41
4.3. Reliability and Validity Test Results 42
4.3.1. Cronbach's Alpha for Reliability and Internal Consistency 42
4.3.2. Validity of the Instrument 43
4.4. Descriptive Analysis of the Constructs 43
4.5. Comparative Analysis of Procurement Cycle Time: Manual vs. eGp Era 46
4.6. Simple Regression Analysis 48
4.6.1. Bivariate Correlation(R) and Coefficient of Determination (R^2) 49
4.6.2. Analysis of Variance 50
4.6.3. Regression Coefficients and Equation 50
4.7. Multiple Regression Analysis 51
4.7.1. Multiple Correlation Coefficient(R) and Coefficient of Determination (R^2) 52
4.7.2. Analysis of Variance (ANOVA) 52
4.7.3. The Regression Coefficients and Equation 53
4.8. Mediation and Moderation Analysis 54
4.8.1. Mediation Analysis 55
4.8.1.1. Staff Competency as a Mediator 55
4.8.2. Moderation Analysis (Boundary Condition) 56
4.8.2.1. System Challenges as a Moderator 57
4.9. Qualitative Data Analysis: the Manual to Digital Procurement Transition Challenges 58
4.10. Findings 60
CHAPTER 5 62
5.1. INTRODUCTION 62

5.1.1. Discussion 62
5.1.1.1 E-Procurement module utilization direct Effect on procurement cycle time 62
5.1.1.2. Staff Competency as a Mediator 63
5.1.1.3. System Challenges as a Moderator 63
5.1.2. E-Procurement module Utilization and its effect on procurement cycle time reduction 64
5.1.2.1. E-Tendering E-Procurement module 64
5.1.2.2. E-Planning E-Procurement module 64
5.1.2.3. E-Purchasing E-Procurement module 65
5.1.3. The Transition Challenges 65
5.2. Conclusion 66
5.3. Recommendations 68
5.4. Implications 70
REFERENCES 72
APPENDIX 76
Research Questionnaire 76

List of Tables

Table 1: Respondents Demographic Profile 39
Table 2: Perceived Percentage of Time Saved 41
Table 3: Cronbach's alpha 42
Table 4: Descriptive Statistics for Key Constructs 45
Table 5: Bivariate Correlation 49
Table 6: Simple Regression: eGp module utilization -> Procurement Cycle Time 49
Table 7: ANOVA table for Simple Regression 50
Table 8: Simple Regression Coefficients 50
Table 9: Multiple Regression model summary 52
Table 10: Multiple Correlation Coefficient(R) and Coefficient of Determination (R2) 52
Table 11: ANOVA table for Multiple Regression 53
Table 12: Multiple Regression Coefficients 53
Table 13: Mediation analysis: Staff competency as mediator (Indirect effects) 56
Table 14: Moderation Analysis: System Challenges as moderator (Interaction effects) 57

List of Figures

Figure 1: Conceptual Framework 30

Acronyms and Abbreviations

AI	Artificial Intelligence
DOI	Diffusion of Innovation
EGP	Electronic Government Procurement
E-Procurement	Electronic Procurement
E-Planning	Electronic Planning
E-Tendering	Electronic Tendering
E-Purchasing	Electronic Purchasing
FDRE	Federal Democratic Republic of Ethiopia
FPPA	Federal Public Procurement Authority
ICT	Information and Communication Technology
IT	Information Technology
KPI	Key Performance Indicator
MAPS	Methodology for Assessing Procurement Systems
MoF	Ministry of Finance and Economic Cooperation
PCT	Procurement Cycle Time
PPPA/ PPPAA	Public Procurement and Property Agency
RBV	Resource Based View
RFQ	Request for Quotation
SBD	Standard Bid Document
TCE	Transaction Cost Economics
TOE	Technology Organization Environment
VRIN/O	Valuable, Rare, Inimitable, Non-substitutable / Organization

Abstract

This study examines the effect of Electronic Government Procurement (eGp) module utilization on procurement cycle time in selected federal institutions, mainly through the E-Planning, E-Tendering and E-Purchasing modules. It focuses on the after implementation stage of the E-Procurement system. The study covers up for the gaps in literature regarding E-Procurement post implementation effects. A total of 250 questionnaires were distributed resulting in 84.8% response rate. The data was collected from active eGp users with roles as procurement officers, technical experts, procurement unit head and endorsing committee that consistently use the E-Procurement system. The study is supported by Resource Based View (RBV) and Transaction Cost Economics (TCE) theoretical frameworks. It tests the relationship between E-Procurement module utilization and procurement cycle. The findings (R^2=0.614, P<0.001) have confirmed the E-Procurement module utilization of the three main modules E-Planning, E-Tendering and E-Purchasing has statistically significant positive effect and explains 61.4% of the variance on procurement cycle time reduction. Staff competency was found to have a partial mediation role (B=0.3129) whereas System challenges has a negative moderation role (B=-0.7563). The comparative analysis results between manual and digital procurement also showed procurement cycle time improvement in all three modules. E-Tendering (Z=-12.579, p<0.001) showed the most improvement followed by E-Planning (Z=-12.527, p<0.001). However, E-Purchasing results (Z=-9.672, p<0.001) showed comparatively lower improvement indicating an underlying limitation. In Conclusion, the Electronic Government Procurement (eGp) system has digitalized traditional procurement methods to reduce the durations of procurement cycles. However, to further achieve the 'the Digital Edge', improvements are needed on staff capacity building, strengthening infrastructure reliability, improving technical support and addressing module bottlenecks.

CHAPTER ONE

1.INTRODUCTION

1.1. Overview

Digital Ethiopia is an initiative to incorporate technological changes into various sectors and areas. These digital transformations are deployed to strengthen and digitalize government institutions. The government launched Digital Ethiopia 2030 following the previous 2025 initiative. The strategy builds on this previous digital transformation phase across the “economy, governance and public services”. (Ministry of Innovation and Technology , 2025) It is also structured to improve the technical skill, ICT infrastructure and address implementation challenges that were present in Digital Ethiopia 2025. One of the main strategies of Digital Ethiopia is transformation of procurement, especially since most of the government budget goes through public procurement systems. The Electronic Government Procurement (eGp) system was launched in 2021 with nine federal institutions. The main aim is to improve the traditional procurement system that encountered long workflow, manual processes, approval delays and high costs. All federal institution procurements are mandated to be executed through the eGp system. It is an important system to transform the economy thus its contribution to improve procurement cycle time is studied in this paper.

1.2. Background of the Study

Public procurement serves as an important instrument operated by the Federal Democratic Republic of Ethiopia (FDRE) to carryout policies and developmental plans. It involves acquiring goods, services and works from providers using various procurement strategies (Royal Institution of Chartered Surveyors , 2015). The Proclamation (Federal Democratic Republic of Ethiopia, 2024) states public procurement is public institutions carrying out procurement by utilizing the public allocated budget. According to (World Bank Group, 2019), the Federal Public

Procurement Agency (FPPA) administers the public procurement process of the federal government institutions.

The procurement cycle or as the (Asian Development Bank (ADB), 2013) describes it, “The procurement chain” includes different stages of procurement. Procurement cycle time is the total elapsed time from the procurement initiation stage to the completion award stage. The traditional procurement cycle had paper-based process, delayed approvals and long manual workflows. These processes slow down the procurement cycle which trickles up to negatively affect various areas of the institution. The Electronic procurement system was initiated as a necessity supported by Public Procurement and Property Authority (PPPAA), Ministry of Finance with the World Bank.

More than 60% of the Ethiopian government’s annual budget is allocated to public procurement. (World Bank Group, 2019) Federal institutions utilized 342 billion birr over the first half of the 2024/25 fiscal year, according to a report published by Ministry of Finance. The government account report shows that 174 federal institutions used up to 152 billion birr over the first quarter, and an additional 190 billion birr in the second quarter. (Endale, 2025). This clearly shows the scale of federal institutions’ spending and especially their majority budget expenditure that passes through the eGp system technology. The effective expenditure of this large budget impacts the national economy, infrastructure development, the country’s growth and societal livelihoods.

Innovation of the procurement process and enhanced cycle time is very advantageous to Ethiopia’s developing economy. Thus, as part of public financial management reform, the Ethiopian government deployed the Electronic Government Procurement system (eGp), a digital platform that transforms the traditional procurement system. The E-Procurement system was developed by an Ethiopian company called Perago Information Systems. E-Procurement technology innovations significantly resolve issues of the manual procurement bottlenecks. (Mastor & Azizan, n.d.)

The Ethiopian Government piloted the Electronic Government Procurement (eGp) system in 2021 with nine procuring federal institutions, the system as of date (2026) has expanded to include 257 procuring entities, 132,736 active suppliers and is still growing. (Federal Public

Procurement and Property Administration Agency, n.d) As of 1st of July 2025, all federal procurements are mandated to be conducted on this platform guided by the new Federal Public Procurement Directive (Ministry of Finance, 2025).

The e-procurement platform is at the core of achieving strategic goals providing transactional cost gain and efficient procurement cycle performance. The eGp strategic objectives (Shakya, 2018) are management of procurement information reports, transactional cost saving, competitive supplier participation, proper use of public funds, improve procurement process efficiency, effective decision making, control and reduction of procurement cycle time. These objectives are aimed at the advancement of the procurement process to combat corruption, improve procurement cycle time and boost operational efficiency. The procurement cycle regularly used core modules are E-Planning, E-Tendering and E-Purchasing. The eGp system as any other system has its own problems. However, there are only few studies who explore E-Procurement module utilizations effect on the procurement cycle time in Ethiopian federal institutions. This paper fills the gaps in literature regarding the assessment of the eGp system post implementation stage. Therefore, this study analysis indicate the effect of the eGp module utilization on procurement cycle time, examines staff competency's mediating role and system challenges moderating role. This paper also contributes to the study of transformation of the traditional procurement process to digital modules functions and their effects on procurement cycle time in selected federal institutions.

1.3. Statement of the Problem

The transition to the digital procurement arises from the need to resolve inherent issues of the traditional procurement. Most existing literatures describe practices of the manual procurement with many shortcomings such as high transaction costs, low value for money, lengthy procuring entity to supplier interaction, data access and transparency problems. These factors create prolonged procurement operations that make plan execution, bidding process and daily purchases really difficult. These factors negatively influence the institution's overall operational performance, incur unnecessary cost and are correlated to longer procurement cycle time. Furthermore, Procurement monitoring indicated by (World Bank Group, 2019) briefs that the procurement institutions lack proper continuous documentation of procurement data. The stored information record gap makes it difficult to assess the procurement cycle performance and

efficiency of the procurement work done and to determine the proper utilization of the public budget and Ethiopia's national growth plan.

While Ethiopian studies are focused on the challenges of the traditional procurement, there is little evidence that dives into studying the e-procurement's actual impact on procurement cycle time and few have focused on the after effects of the system. (Elias, Mahidin, & Shiratuddin, 2003), compared the traditional procurement to the e-procurement process specifically e-tender. The comparison showed paper usage decreased by 90% and long lead time reduced by over 80 % with the help of digitalized procurement. However, several researches like this one are done globally and aren't studied in the Ethiopian institutions dynamic.

EGP system implementation objective of transitioning to a digital system from traditional procurement processes is to facilitate procurement efficiency through minimization of transactional costs such as time, labor and resources. However, The adoption of the system hasn't been seamless; there have been many challenges before eGp adoption, during the first year pilot phases and now after implementation that require continuous research. According to (Teklu, 2020), who studied early eGp system adoption and (Menile, 2024), who studied the factors that affect eGp system user satisfaction, the main challenges in both cases are mainly adequate ICT infrastructure, employee competency, managerial support and electronic approvals issues. The factors that affected the primary nine eGp pilot institutions are eGp training, Infrastructure availability, supplier eGp acceptance, and Legal & regulatory frameworks. (Kassahun D. , 2024) However, these studies in the Ethiopian context are more focused on early adoption stages of the eGp system and its user acceptance. The after implementation stage of the eGp system is yet to be studied in Ethiopian federal institutions.

The Ethiopian Federal Government has put in significant amount of effort into e-procurement to achieve strategic goals through federal institutions. Thus, more research on the transition to this modern procurement technology and E-Procurement effectiveness in improving cycle time is important for Ethiopian federal institutions development. Investments in the 'Digital Edge' of procurement are crucial. The exploration of the effects of digitalization of each phase or functionalities of the procurement cycle is important to analyze effects of E-Procurement automation. This paper uses the key measurement of procurement success; reduced procurement cycle time that contributes to efficiency, effectiveness, transparency, improved operational

performance. It fills the gaps relating to the effect on performance measurements other studies do not address. The findings of this paper are expected to pave the way for other related studies by focusing on the after implementation stage of the system.

1.4. Research Questions

- How does E-Procurement module utilization have an effect on procurement cycle time in Ethiopian Federal Institutions?
- How has the transition from manual to digital procurement affected the procurement cycle time?
- How does staff competency such as technical skills, system knowledge and level of system understanding influence the efficiency of the E-Procurement process flow?
- How do system challenges such as system bugs, server downtime and connectivity issues hinder the improvement of the procurement cycle?
- What are the main bottlenecks that influence the effective use of electronic government procurement (eGp) system in reducing the procurement cycle time?

1.5. Objective of the Study

1.5.1. General Objective

The General objective of this thesis is to analyze the effect of E-Procurement on Procurement Cycle time in selected Ethiopian Federal Institutions.

1.5.2. Specific Objective

The following will help achieve the general objectives of this paper

- To analyze the effect of e-procurement modules (E-Planning, E-Tendering, E-Purchasing) on Procurement cycle time efficiency after eGp implementation
- To examine the effect of the transition from traditional procurement methods to electronic procurement system in Ethiopian federal institutions
- To assess the effect of staff competency such as technical knowledge, skills and level of E-Procurement system understanding on the procurement cycle efficiency

- To determine the effect on procurement cycle time caused by system challenges such as system bugs, server downtime and connectivity issues
- To identify the main bottlenecks affecting the effective utilization of the eGp system and their impact on procurement cycle time reduction

1.6. Research Gap

A deep review of existing literatures reveals significant gaps specifically around the E-Procurement system post implementation phase. Previous studies haven't assessed procurement cycle time reduction incurred from the adoption of E-procurement after its full implementation and mandate in 2025 instead the researches are more focused on early adoption stages, user satisfaction and readiness in Ethiopian federal institutions. The Studies done around procurement explore the traditional, without tech involvement like (Mekonnen, 2022) that analyze factors affecting public procurement performance of governmental organization with no mention of technology having an effect in procurement performance. While other literatures recommend using technology in procurement as a solution (Kassahun M. , 2021), the studies lack in methodology and are more generalized which is hard to apply in Ethiopian federal institutions while other literatures focus on a specific public entity, sector or a single company, factory.

There are also literatures examining e-procurement in a generalized manner; its effect and factors that affect it, but there is a clearly visible research gap especially studying this thesis topic and scarce empirical evidence with a focus on the Ethiopian federal institutions. Previous studies suggest unverified models and generalized conceptual framework. Most studies explore a specific institution/company, for instance this study (Teklu, 2020) limited to Addis Ababa City Roads Authority assesses factor that affect eGp adoption. It is a literature that assesses readiness measure of e-procurement adoption before it was deployed. The findings are mostly expected conclusions like eGp would be beneficial to organizations with a suggestion that the system rollout will be effective with strengthened ICT infrastructure and effective staff training. The general adoption model mentioned is not validated in the federal institution.

(Menile, 2024), studies how user satisfaction is affected by the system with a scope in 5 federal government offices after the first year of eGp adoption .it relates the success of eGp to user satisfaction. Five variables were seen as influencing this; ICT infrastructure, staff competency,

management support, accuracy and timeliness. These are factors that affect eGp users, this study is more user focused and doesn't directly address the system efficiency and measure performance that contributes to improvement. Factors affecting the eGp system are further discussed in (Kassahun D. , 2024), a literature studied in nine selected federal budgetary organizations conducted before full implementation across all federal organizations explores key factors that determine effective implementation of the system like staff trainings on eGp system, ICT infrastructure, regulatory framework and supplier eGp acceptance.

This thesis fills the gaps of previous studies by studying the effects of the implementation or the after effects of eGp adoption providing reduced procurement cycle time and organizational success after the entities mandate to adhere to the system in 2025. It mainly focuses on E-procurement modules functionality in the procurement cycle as it is being actively conducted in the Federal government institutions.

1.7. Significance of the Study

The findings of this study provide an assessment of the effectiveness of the electronic government procurement system, the digital transformation of the procurement cycle, the effectiveness of the systemic changes in the procurement process and its contribution to the reduction of cycle time in Ethiopian federal institutions. The significance of the study is as follows:

- The study addresses the limited literature on eGp post implementation effect on procurement cycle time especially during the institutions mandate to use the system as a primary procurement tool. Thus, this research paves the way for other studies related to this thesis topic, acting as a base to explore e-procurement modules actual effect in the Ethiopian dynamic.
- The study helps procuring entities as well as procurement managers identify the main factors that affect the speed of the procurement cycle and resolve the challenges to better utilize the system to achieve their strategic goals; minimize time, money and other transactional costs.
- This paper helps system users i.e. procurement staff or suppliers understand the advantages of the system to achieve the 'digital edge' in procurement, offering more

suppliers national or worldwide access to bid competition and helping procuring entities acquire quality procurement outcomes with value for money.

- An improved procurement cycle correlates to proper allocation of public budget which in turn contributes to growth of the federal institutions. Reduced procurement cycle time produces faster project completion that contributes to the country's development and economic growth.
- This study provides the Public Procurement and Property Authority (PPPA) and Ministry of Finance with insights into the state of digital procurement in the federal institutions after full eGp system implementation and the effectiveness of recent mandates and directives. The findings may also serve as feedback to the system developers on users' experience and the system weak areas.
- Although non-eGp system user institutions are not incorporated in this study, the findings are intended to provide insight into the current state of E-Procurement to the Federal Public Procurement and Property Authority (FPPA) to influence future policies applicable to all institutions. The study results serve as a feedback to system developers on the system module weakness and bottleneck which will provide an improved procurement system applicable for all procuring entities. Furthermore, the findings also recommend that procuring institutions set up continuous staff capacity building programs and encourage more investment on infrastructure which are important to achieve the digital edge in E-procurement, an innovation that transforms the procurement cycle and reduces unnecessary challenges. Therefore, this system can then be seen as an important tool that non-eGp users can leverage to streamline their procurements and efficiently manage simple to complex procurement types.

1.8. Scope of the Study

The scope of this thesis is focused on selected early eGp system adopter of eGp expansion phase. These Ethiopian federal institutions are located in Addis Ababa and include procuring entities that actively use the electronic government procurement system on a daily basis. The study is bounded to analyze the effect of e-procurement on procurement cycle time. It provides insight into how digital transformation affects the procurement process without directly assessing e-procurement impact on financial, social, economic and political aspects. The research involves

active eGp system users in the federal institutions' procurement department such as procurement officers, procurement unit head, technical experts and endorsing committees involved in the procurement cycle.

The scope is geographically and institutionally bounded to selected Ethiopian federal institutions located in Addis Ababa that are registered and actively use the eGp system. These institutions are specifically drawn from early adopters' population of (2021-2023) eGp system expansion phase of 74 institutions. (Tafesse, 2023) The sample frame of 30 Ethiopian federal institutions were selected from this category using homogeneous purposive sampling technique and represent the early adopter institutions which are administered and operate under the Federal Public Procurement and Property Authority (FPPA) that utilize the government allocated public budget. These federal institutions include: Regular authorities, Technical agencies and Ministries that share comparable institutional structures and procurement functions mainly to provide a uniform comparative study. These institutional types reflect the Ethiopian federal administrative structure: Regular authorities are sector specific regulatory and implementation bodies such as Ethiopian Communications Authority, Ethiopian Maritime Authority; Technical agencies are specialized institutions such as Information Network Security Administration, Financial Intelligence service and Ministries are policy setting federal bodies such as Ministry of Peace. All selected institutions were targeted because they have professional staff with up to 5 years of eGp system and procurement field experience.

In general, the findings of this study are generalizable within the category of early eGp system adopting institutions, specifically the 30 selected institutions out of 74 institutions that were integrated into the eGp system between the years 2021-2023.

1.9. Limitations of the Study

The goal of the study is to examine the eGp procurement modules and analyze the effect of other variable like staff competency and system challenges in the selected federal institutions. The research obtains insightful results from the findings. However, there are some limitations.

The study is geographically limited to Addis Ababa federal early eGp system adopter institutions. The respondent scope is limited to active eGp system users in the federal institutions' procurement department such as procurement officers, procurement unit heads,

technical experts and endorsing committee members. The study does not include the non-eGp user institutions and supplier side organizations, so the supplier side system effects and external factors are not captured. The study was also restricted due to time, financial, data access, privacy/security constraints and constrained by the willingness of the institutions to provide the needed data and the availability of accurate and reliable procurement cycle time records. The other limitation is biased responses and perceived data that procurement staffs give on the survey, which may be subjective. Additionally, existing data that could be used to compare eGp record assessments with the traditional procurement record and its cycle time is also very limited, varied and incomplete due to the lack of consistent structure of manual record keeping across the federal institutions.

In general, the findings of this study are not fully generalizable to all federal institutions, Addis Ababa city administration institutions or regional government institutions or In other words, it is not generalizable to all the current mandated 257 procuring entities or 169 federal institutions using the eGp system. This paper aims to narrow these limitations, set a base for more research and maintain its objective by various methods. The data collection process involves persistent and rigorous attempts to get more surveys done to minimize the constraints. The responses remain anonymous to maintain honest and transparent feedback of the current state of the system.

1.10. Definition of Key Terms

E-Procurement - It is the digital platform that integrates Information and communication technology (ICT) in the procurement process to improve the traditional workflow. It is the independent variable in this thesis encompasses the main modules; e-planning, e-tendering and e-purchasing which streamline the procurement cycle. (Mastor & Azizan, n.d.)

Procurement Cycle - (ProQsmart, 2024), describes Procurement Cycle as the systematic process of acquiring goods, services, or work from suppliers.

Procurement Cycle Time - It is defined as “the total time taken from identifying a need of goods or services to the final award, delivery and receipt of the procurement.” (EOXS, n.d.). The data from this cycle is an important indicator that tracks expenditure and available resources. (World Bank Group, 2019)

Electronic Government Procurement (eGp) system - It is basically governments' use of E-Procurement in procurement activities involving suppliers. It is a digital system that transforms the procurement cycle of acquiring goods, works and services in the federal institutions. (World Bank, 2007)

E-Planning - It is a stage in eGp system procurement cycle which starts from departments need collection, passes through procurement planning phases and is published to the public on eGp platform. It includes schedule, method and allocated budget of the needs in lots. (Ministry of Finance, 2025)

E-Purchasing - It is the application of online e-purchase system technology for acquisition of high volume of procurement with low value. (Asian Development Bank (ADB), 2013) It is mainly used for emergent, priority and on-demand procurements. It includes procurements bounded by threshold of 800,000(Goods), 500,000(Consultancy Services), 600,000(Other Services) & 2,000,000 Birr (Works). (Ministry of Finance, 2025)

E-Tendering - "It is the process of using online procurement (e-Procurement) platforms to automatically solicit bid tenders and evaluate suppliers." (Cook, 2025) **"**It is defined as the electronic issuing and receipt of any tender documentation in electronic format as part of the procurement process. (Society of Chartered Surveyors Ireland (SCSI) and RICS, 2014).The Threshold of tendering includes procurements above the purchasing threshold. (Ministry of Finance, 2025)

Public Body - It is the federal government procuring institutions that utilize the allocated public budget administered by the public procurement and property authority. (Federal Democratic Republic of Ethiopia, 2024) These are the Ethiopian federal institutions that are actively using the electronic government procurement system for procurement activities.

Federal Public Procurement Directive No. 1073/2025 - It is the Ethiopian Federal procurement directive that outlines procurement regulatory framework aligned with international regulations. It mandates the federal budgetary institutions use of the eGp system as the main means of procurement.

1.11. Organization of the Thesis

This thesis is organized into five chapters:

Chapter one starts with the introduction part of the thesis. It includes background of the study, problem statement, research questions, general objective, specific objectives, research gap, significance of the study, scope, limitation and the organization.

Chapter two follows with the literature review including theoretical, empirical, and conceptual framework. It goes through various literatures to build the framework and argument for this thesis.

Chapter three describes the research methodology deals with the research design, research approach, data collection strategy, sampling techniques and data analysis plan.

Chapter four presents the data findings and discusses its analysis results that are generated from the survey.

Chapter five concludes the thesis with the generalized summary of the findings and provides recommendations for future researches.

CHAPTER 2

2.LITERATURE REVIEW

The literature review provides the ‘’Digital Edge” of procurement analysis framework focused on the post implementation phase. The research identifies critical gaps in existing literature after deep review in various related topic areas. A theoretical foundation is set with integration of Resource Based View (RBV) and Transaction Cost Economics (TCE) theories that support the conceptual model that results faster procurement speed and improved institutional performance. All this contribute to the core of analyzing how E-Procurement modules transform the shortcomings of the traditional procurement inefficiency.

Systematic literature review is a methodology or a strategy for reviewing related literature. This is an important tool that improves what procedures to take strategically to achieve high performance. The main focus is the relationship between the independent variable: E-Procurement influencing the dependent variable Procurement Cycle Time (PCT) with the dynamics of the variables that establish theoretical foundations using the Resource Based View (RBV) and Transaction Cost Economics (TCE) frameworks. The thesis topic is studied using various research references such as scholarly and other related literatures (journals, articles, and studies), directives (EGP. PPPAA), reports (World Bank, MAPS), and regulatory documents (procurement manuals, directives) are explored and reviewed. The combination of the procurement supply chain and IT digital fields in procuring companies cycle time and performance are key search terms implemented around different geographical areas. The findings from the literatures are included in this and other chapters to lay the conceptual foundation for the research.

Research on procurement cycle time reduction is rare and very few research the E-procurement adoption while user readiness and satisfaction are studied well. This study addresses this issue assessing the actual impact of the implementation of the system on the ground.

2.1. Theoretical Framework

2.1.1. Resource-Based View (RBV) & eGp system Capabilities

The Resource Based View theory proposed by (Wernerfelt, 1984) recommends viewing institutional operations from an internal resource perspective and utilizing their capabilities to achieve competitive advantage and improve performance. It is an important perspective in strategic management that gives insight into an organization's profits, growth status and resource management. This framework defines Resources as tangible and non-tangible assets that are thought of as strength or weakness of an institution" (Wernerfelt, 1984).

To implement this theory, public procuring entities should balance the exploitation of existing and new resources. The resource focus shouldn't only be on financial resources but must also incorporate various resources linked to this paper topic like technological skills, efficient procedures, innovation and quality of human resources are needed along with the basic resources

like physical, human, organizational, technological, financial and reputational resources. (Mailani, Hulu, Simamora, & Kesuma, 2024)

The (Wernerfelt, 1984) theory also highlights the importance of VRIN/O characteristics which states that resources should be Valuable, Rare, Inimitable, Non-substitutable / Organization and for achieving a satisfactory operational performance with the organization's support. The eGp system is considered as a key resource to the institutions. The different modules of the system consist of different templates, enhanced features and improved process designs recommended by the public procurement and property authority. The system functions combined with adequate ICT infrastructure and competent staffs are the core assets that significantly improve the procurement cycle.

The eGp system is also a strategic technological resource that provides institutional and national efficiency capabilities. Staying updated with the current procurement trends elevates the institution operations, employees' technical capability and provide sustainable growth aligned with strategic goals. E-Procurement provides an innovation capability to sustain the procurement cycle. Many literatures explain the combined use of process; routines with information and knowledge facilitate improvements in performance. Technology as a resource necessitates understanding, practice, training and proper utilization to reach the proposed outcomes. Knowledge of competent human resource capabilities at different levels helps allocate and aim for the right position assignment and proper management. (Cabrera-Moya & Reyes, 2018)

E-Procurement user skill development is a very important factor that affects the full E-Procurement system implementation. The continuous skill development of these users will help strengthen the transformation of the procurement cycle. (Burtscher, Piano, & Welby, 2024) E-Procurement knowledge, understanding, skill and competency of the procurement staff is a valuable resource to the E-Procurement process and cycle time reduction. Through consistent training, knowledge sharing and follow up, highly competent human resources can be acquired.

In conclusion, The RBV theory supports this study by explaining the E-Procurement resources such as Staff competency, ICT infrastructure, tailored eGp modules and procurement process efficiency that improve procurement cycle speed. The eGp system shows VRIN characteristics because it has transformed the public procurement at this scale with valuable system function

and module utilization features designed tailored to the Ethiopian traditional procurement improved with the continuous feedback based updates of the system versions which makes it inimitable and non-substitutable. However, the effectiveness of these characteristics depends on the capability of the human resources. Therefore, this study assesses the role of staff competency in E-Procurement implementation, identifies the challenges affecting the skill growth of the staff and provides recommendations to further improve the procurement cycle performance.

2.1.2. Transaction Cost Economics (TCE) & Cost Minimization

Transaction Cost Economics, a principle of (Williamson, 1985) is a modern institutional economics analysis that is crucial for understanding institutional structure and performance. The theory mainly aims to establish methods and frameworks that minimize transaction costs by following the right procedures. The key concept is identifying costly transactions and their causal factors.

The Traditional public procurement method is limited by high transactional costs such as resource cost related to long cycle time and manual labor, search costs for finding suppliers and advertising bids, information costs of verifying suppliers' qualifications and accurate procurement data, and administrative costs from handling paper bids, manual evaluations and approvals. High transaction costs negatively affect the institution operational efficiency. If it is not properly managed, it affects overall institution performance.

The innovations in E-Procurement practices and transformation of the existing structures can reduce transaction cost and its burdens. (Williamson, 1985) Theory states that this transaction cost is caused by the bounded rationality constraint of the staffs' capability. The human resources have limited ability to process large complex data free from fault. These limitations can be reduced by the automation of the procurement operations that systematically execute the data processing

E-Procurement modules automate the manual bidding, advertising, evaluation and approval processes. It gives access to various competitive suppliers and their information on centralized eGp platform. Standardized templates and tools lower cost, effort and time by streamlining the procurement process. A structured way to managing transaction costs facilitates optimized identification and selection of information in complex decision making in the procurement

platform. TCE explains the shift to the “Digital Edge” of eGp innovation is designed to transform the existing procurement cycle which significantly minimizes the costs incurred.

Therefore, TCE supports the transition to E-Procurement that is designed to replace the high transaction cost manual procedures with streamlined digital tools. This transition minimizes unnecessary cost of the federal institutions and saves time in the procurement cycle stages. Additionally, procurement policy and regulation should also be flexible to lower these costs and facilitate economic efficiency. Furthermore, the institution can design incentives and training for staffs that are essential for long-term success in conducting sustained growth through digital advancements and lowering labor costs.

2.2. Conceptual Literature Review

2.2.1. Procurement cycle time and operational performance measurement

Public procurement is required to drive the efficiency and effectiveness of an institution’s operational plans. Innovative procurement practices improve organizational competitiveness, profitability and maintain sustainable growth. Existing literature discuss the effects of process automation improvements and their functionalities on operational work flows. Although all dimensions aren’t deeply explored, the conceptual link between electronic procurement process and operational performance is described as positive.

The digitalization of procurement is fundamental to improve institution operational performance. (Audit Scotland; NHS Scotland, 2001). Performance can be defined briefly as the institutions’ ability of completing determined goal or objective. (ProQsmart, 2024) Operational performance in the E-Procurement context is achieving procurement plans with enhanced efficiency and speed. The public operational procurement process is characterized by excessive amounts of data and information exchange that are used for important decision making. However, manual processes have challenges like lack of flexibility, adaptability, accountability and data consistency. Because the public sector utilizes public budget, hence should apply maximized ‘value for money’, although there aren’t any formal performance management key performance

indicators for measure of public procurement and spending put in place. The management of the procurement cycle must include continuous monitoring across different stages.

Key performance indicators (KPI) must be set through assessing operational performance over time. (ProQsmart, 2024), supports this KPI method with evaluation of the procurement process results and adds another principle to measure variance between objectives and targets. Continuous monitoring of the procurement procedure, system quality and performance must also be carried out to assess the systems' speed and capability. This method referred to as Methodology for Assessing Procurement Systems (MAPS), suggests a ready to use performance management framework should be put in place to make better decisions on how to spend taxpayers money. (The World Bank, 2021), directs essential framework to be applied in every main stages of the procurement cycle measurement.

The E-Procurement modules digitalize the procurement cycle stages to improve operational performance. The E-Procurement workflow contains electronic approval check-in points that ensure policy compliance and well-rounded decisions still leaving room for corrections. The automated E-procurement feature has an instant publication for each of the e- GP modules. (The World Bank, 2021), rep orts the system contains Standard Bid Document templates and Workflow management. The templates are the standardized task forms that replace repetitive procedures.

Procurement cycle time is a very important key performance indicator (KPI) that is used to measure process agility. Factors that majorly influence it include the internal procurement process (the duration from purchase request to order/delivery), technical expertise, right supplier selection, firm-supplier relationship and supplier order delivery time. (Asgharia, Rostambeygi, Hosseini, & Motamedib, 2022) Furthermore, Procurement performances can be strengthened by good planning practice and implementation, no delays in procurement cycle execution; transparent product price aligned nationally, effective use of procurement mechanisms, efficiency level of the procuring department, effective staff training program and the competitive procurement environment. (OECD, 2023). In general, improvement of the cycle agility depends on the procurement department efficiency, system stability maintenance, staff training and competence building programs.

In critical periods, the procurement department is relied upon to achieve the strategic role in the institution. This department is responsible for cutting costs, allocation of liquidity and operation plan achievement. On the study of (Arthur D. Little, 2009), two important examinations are discussed which are “cash saving, a financial measure of changes in expenditure” and “saving vs. market price development”. Additionally, the findings in (Agbeka, Quagrainie, & Kabalan, 2024) state “while operational performance is important for a company’s competitiveness and profitability, the result indicated higher and optimal (not extreme) level of procurement practices achieve higher levels of operational performance.” Therefore, it is recommended for organizations to reform their procurement strategies and practices to bring significant change in procurement.

2.2.2. The Role of Technology in E-Procurement Efficiency

Technology innovates and facilitates the process of procurement and improves performance of these business operations. The role of AI can not be ignored and can be recommended to automate repetitive tasks. (ProQsmart, 2024)

The outcome of technological advancements is a backbone for strategic planning in organizations as viewed by (Golson, 1977)**.** Technology is not just another tool to improve process but is seen as a necessity especially in this day and age. It is like water for survival in face of competition as a country and in the market. It makes it possible to fulfill the multitude needs of Ethiopian federal institutions and ensure accountability at the same time. (UNCTAD, 2025) The 2025 report on frontier technologies highlights the importance of ‘strategic public procurement’ as a key measure to adopt AI with increased R&D funding, suggests that government investment plays a crucial role for E-Procurement systems success and growth progress.

Technological determinism is a concept mentioned in (Asante, 2013) as an economic approach that views technology as a sole path for success that drives companies and economies while neglecting the negative sides to it and overlooking it as a dependent variable which relies on users, decision makers and society. There are effects of technology discussed on the literature that need to be put in consideration such as the cost of integration and maintenance of a system as opposed to the productivity, cost of outsourced system support services and new human

resources, cost of new system devices & tools, new system government policy challenges, achieving best quality product or service specifications on lower price system, customer satisfaction based on expectation and reality of the system output. While lack of digital awareness, organizational resistance to change and system deployment costs may exist when traditional manual processes integrate systems. There are also lots of revolutionary benefits to it. (Adebayo, 2025)

2.2.3. Conceptual Framework of Electronic Government Procurement (eGp)

(WorldBank.org, 2007), defines Electronic Government Procurement (eGp) as "the use of information technology by governments in conducting their procurement activities with the suppliers for the acquisition of works, goods and services required by the public sector". This indicates the inclusion of technology to systemize the tedious and time-consuming process of the manual procurement practice which has many challenges. This technology takes the manual process and transforms it into accurate, quicker, manageable and powerful procurement tool.

The eGp manual define eGp as a national electronic government procurement portal that uses an electronic system to handle transactions in the public procurement process. (Shakya, 2018) It enhances the overall procurement cycle as procurement templates are used to cut down repetitive exhaustive manual tasks. It makes it easier to increase efficiency by minimizing manual errors and unwanted costs. It is the best way to revolutionize the procurement cycle for innovative operations. eGp is a platform mainly developed to manage the huge public fund.

According to (Edwin Muhumuza, 2022), Digitalization of the whole procurement process often through comprehensive electronic government procurement system that can manage the many components involved across the procurement process, holds out the promise of delivering transformational change in the efficiency and accountability of the procurement. This suggests the importance of digitalizing government procurement processes for a better overall performance and effectiveness. It also highlights its significance to public administration reform building transparency and accountability.

The eGp platform showcases the core modules: E-Planning, E-Tendering and E-Purchasing that the procuring entities or federal institutions and suppliers interact with. (Federal Public Procurement and Property Administration Agency, n.d)

2.2.4. E-Planning & Procurement Cycle Efficiency

Electronic procurement planning is the foundation for efficiency**.** (Society of Chartered Surveyors Ireland and RICS, 2014) The New eGp directive (Ministry of Finance, 2025) defines "Annual Procurement Plan as a document that outlines the timing and manner in which a Public Body will conduct procurements necessary for program implementation and institutions strict adherence to the system is outlined for effectiveness." The needs of each departments in the institutions is submitted through the system which is then consolidated and categorized into different prepared Lots that are then reviewed and approved by Procurement Unit Head, Endorsing Committee and Head of Procurement Entity respectively. After checking its alignment with the operational plan and financial budget, it is then published on the eGp portal to the public and will also be reviewed by the Federal Public Procurement and Property Authority.

According to (The Office of Procurement Regulation, 2023), the systems planning module should guide the E-Procurement Plan with external publication/bulletin boards for widespread access. This is applicable as it is required to be published within a given time period on the official eGp website. This is important because it makes it easier to manage federal institutions plans compliance to strict schedules put by the authority. The different plan initiation types included in the system are operational, project, supplementary, framework and strategy plans.

In conclusion, the systematic way of planning is comprehensive and simple. The approved lots in the plan are readily available for critique and access on the portal. The procurement staff can directly forward them to the next step purchasing or tendering easily. The schedule of the start and end of the planning deadlines are easier to manage at each step which prevents delays and facilitates the procurement cycle time. During lot preparation stage each lot is allocated a budget from the overall budget set by the public procurement and property authority. Thus, every part of the procurement is aligned with the budget that helps achieve operational goals and performance.

2.2.5. E-Tendering and Procurement Cycle Efficiency

Electronic tendering is a key part of the digital procurement process following E-Planning. It is a simplified enhanced process of conducting the entire tendering process which involves bidders participating in the bidding process by submitting their proposal and prices to fulfill the requirement set by the procuring entity digitally (Cook, 2025) i.e., preparation of the different types of tender like goods, works, consultancy and non-consultancy with specifications to evaluate and narrow down suppliers for award of contract. This competitive E-Procurement tool opens way to access wider variety of qualified choices for both the procuring government institution and registered supplier.

The traditional tendering process is basically the procuring entity publishing the tender notification using different communication outlets to be purchased by the participating supplier. (Mastor & Azizan, n.d.) E-Tender is at the edge of the digital development of the buyer-supplier chain that harnesses current advanced systematic technology and requires expertise. It minimizes the repetitive, time & cost consuming manual tender procurement that requires paper based bid preparation, advertisement, submission and opening of tenders that is prone to errors.

E-Tendering is an automated high value procurement procedure that follows the route from enquiry to tender acceptance/submission of individual tender offers or withdrawal. (Royal Institution of Chartered Surveyors , 2015). It is a solution used for specialized high-value and low-volume goods, services and works procurement. The objective of E-Tendering is to speed up the whole process and increase productivity. (Amarapathy, Jayasena, & Ranadewa, 2013) The two most important things to consider on this route are selecting the right supplier/contractor and setting a fair price mainly through the exchange of information between both parties.

The phases of bid advertisement, communication, clarification, submission, opening and evaluation phases are less complex and easy to use. These steps cover the majority of the exhausting procurement process. Therefore, the procurement cycle time is facilitated and better outcomes are achieved. The system also attracts a wide variety of suppliers leading to better quality options, pricing and “value for money”. Acquiring these assets is key method to an institutions operational performance.

Most tenders float based on the stated bid Validity Period, which is a period tenders remain active and open for suppliers according to the latest Ethiopian procurement directive is 10 days for Goods, Consultancy Service, non-Consultancy Service and 20 days for Work national non-complex tender. (Ministry of Finance, 2025) Higher threshold priority use methods like direct and limited E-Tendering directed by the head of the procuring entity following the stated directive. Following this updated and priority system path mandate in the procurement cycle shows the change made by the system implementation that is crucial for policy compliance and improved procurement cycle speed.

2.2.6. E-Purchasing and Procurement Cycle Efficiency

E-Purchasing is a solution that addresses low-value and high volume transactions of standard goods and services. It is mainly embedded on the electronic system for wide variety bulk procurement through request for quotation (RFQ), purchase order requisition/ pro-forma and emergency procurement. It is a day-to-day procurement tool frequently used in federal institutions. Lower price items are frequented in most of these on-demand purchases. Additionally, the E-Purchasing facilitates these low cost needs that are at certain threshold. Large amounts of suppliers actively wait and participate on the go when these opportunities are published. This automation of the competitive environment results in acquiring best deals at a reasonable duration for the federal institution's budget utilization.

The E-Purchasing module of the eGp system offers easier and quicker cycle path compared to the other modules because routine purchases happen with just simpler steps and in shorter time span. This massively improves the procurement cycle time especially focusing on urgent, emergency, volume and priority procurements. The whole performance of the purchasing operation is smoother as it is cost effective when looking from procurement cycle time and labor cost perspective.

2.2.7. Supplier Management and Registration

The general procurement process for suppliers' starts with pre-qualification and supplier registration, a step in which bidders submits their legal documents for approval to be an active supplier on the system. Then the procuring entity sends tender invitations with specifications for suppliers' response.

2.2.8. E-Procurement modules, methods and thresholds

Ethiopia is transitioning to systemic public procedures harnessing the modern digital edge to meet international standard. The (WorldBank.org, 2007) lists E-Procurement applications like interactive E-Tendering, E-Purchasing, E-Auctioning, E-Ordering, E-Invoicing and E-Payment. This Thesis primarily focuses on the three major and mostly used modules which are E-Planning, E-Tendering and E-Purchasing.

Procurement methods authorized by Federal Public Procurement Directive are Open, Selective, Limited and Direct Tendering. Contractual framework agreements are easily available for continuous volume order from multiple contracted suppliers. (Ministry of Finance, 2025)

2.3. Empirical Literature Review

The eGp system contains features that manage the full E-Planning, E-Tendering and E-Purchasing life-cycle. It handles the complexity of procurements (Burtscher, Piano, & Welby, 2024) and automates at a lower cost saving government expenditures, resulting in improved government procurement outcomes and operations efficiency. According to a study (World Bank, 2007), It surpasses the manual procurement process in efficiency, accuracy, transparency and cost effectiveness. The traditional procurement process is paper based, slow, prone to errors and has lack of transparency, accountability. (Williamson, 1985), describes performance measure as the assessment between planned objectives to achieved results. It then concludes that E-Procurement practices like E-Planning, E-Tendering and E-Purchasing contributes to improved public entities performance, strategic procedures and better usage of federal budget.

(Smadi & Ababneh, 2018) Paper highlights physical assets like IT infrastructure combined with human assets like highly skilled reliable staff that are able to handle issues surrounding the system influence the upward progression of E-Procurement adoption. (Apleni & Smuts, 2020) The capability of the ICT infrastructures such as capability of Servers, operating systems and tools for infrastructure security, data, content, hardware management affect the performance of the system. The significance of investing in ICT Infrastructure surpasses the benefit to the institution and contributes to the nation’s development sustainability

Other existing literatures are bounded to one module (e-Tendering) and other countries like the literature conducted in Saudi Arabia which has a main focus on specifically the role of e-Tendering improving efficiency while the literature (Wako, Oteki, & Abillah, 2024) conducted in Kenya also particularly assess e-procurement technology factors affecting the specific e-tendering module. The findings of these literature cannot be applied because the differences of the dynamics that exist. The main standardized modules; e-Planning, e-Tendering and e-Purchasing effect on the e-procurement cycle actively being implemented in the federal institutions of Ethiopia is yet to be addressed.

Existing literatures explore the electronic procurement system in Ethiopia at earlier stages of its use and lack empirical evidence around the systemic procurement cycle. (Teklu, 2020), assesses eGp adoption readiness limited to Addis Ababa City Roads Authority in the pre-implementation stage. The identified findings and barriers of the research aren't analyzed on actual post adoption stages. While (Menile, 2024) study is on user satisfaction across five federal institutions. User satisfaction is overall user centered feedback exposed to subjectivity overseeing the systems' actual mechanisms. This study explores the procurement cycle to grasp system functionalities supported by empirical evidence.

2.3.1. The traditional procurement process standard and inefficiencies

Ethiopian Federal institutions used the traditional procurement workflow that was paper based and manually executed. Its planning stage started from need collection at each department then manual preparation of the standard bid document (SBD) with detailed specification is printed out and advertised in newspapers and different media outlets. Suppliers bought the bids and submitted their offer using high quantity of paper. The suppliers were then required to be present at bid opening ceremony. Next, the procurement technical experts go through all the proposals of the suppliers. This step is a manual exhausting evaluation and ranking that is labor intensive and time taking. Once the supplier is selected or the result of the evaluation is official, suppliers can complain and ask for clarifications which are also done in paper. This is long standing practice that the procurement staffs and suppliers are accustomed to with years of experience which doesn't require technical knowledge. Unnecessary steps are taken that are also prone to delays

like waiting for approvals and various environmental constraints that slows down and hinder the procurement process. (The World Bank, 2021) It is a method that has limited supplier participation, low reach competitive environment and error prone process. It is functional to people unfamiliar to tech and flexible in complex methods. Their participation in the procurement process is considerable but the world is changing and the challenges are very critical to the whole procurement cycle. The systemic change is essential to transform and facilitate the overall procurement cycle performance.

2.3.2. Comparative analysis and Expected benefits of eGp

The very core purpose for the initiation of eGp system innovation is to reduce procurement cycle time, to improve operational performance and ensure accountability. The system creates a standardized procurement platform with ready to use templates and digitalized core procurement mechanisms. Every step from planning to award is automated. Departments submit their needs to the procurement on the system then the procurement staff consolidates prepares lots packaged into an approved annual procurement plan that is published on the eGp website. The plans can then be accessed by everyone including the Public Procurement and Property Authority. The tenders are also published to the public after their preparation process based on the standard bid document (SBD) template and added specifications. Suppliers have access to a variety pool of tenders and vice versa the procuring entity can also get best deals through suppliers' competition. eGp has security features in which technical experts can only open the Bid when suppliers send their encrypted key and each bid opener; evaluator has authentication code in the bid opening and evaluation process. Notices, complains, clarification requests, evaluation results, endorsement and awards are communicated and handled electronically on this web system.

The users follow procurement workflow phases accompanied by approvals at every step from needs collectors all the way to the head of the procuring entity quicker decisions that comply to the regulation and policy framework. There is a report feature with procurement information on each module. Plans, tenders and other records are easily accessible. This makes it easier for audits, transparency and accountability. Regulation compliance management of supplier and procurement information is one click away. The digital work flow with integrated core function and mandated schedules set-up reduces delays, error and corruption significantly. Thus, eGp

through the use of technology evidently contributes to rapid procurement cycle time and maximized performance.

2.3.2.1. Regulatory Evolution of Procurement Cycle Time Standards

A review of two consecutive Ethiopian federal procurement directives shows how the regulatory framework governing procurement cycle time has evolved since the eGp system introduction. Directive No. 814/2021 established the pilot stage legal foundation for e-procurement, applying only to a selected subset of federal institutions. While it introduced electronic communication as the standard for procurement activities, it provided no differentiations of floating periods, subjecting all bids to the same paper based manual procurement timelines and prescribed no calendar deadlines for annual plan finalization, performance reporting, or clarification request timelines. This left the procuring entities with no enforceable time obligations at key phases of the procurement cycle (Ministry of Finance, 2021). Directive No. 1073/2025 represents a significant shift from this framework. Effective July 1, 2025, it mandates eGp use across all federal public bodies and directly lists differentiated minimum floating periods by procurement type and complexity, ranging from 10 to 40 days for tender module procurements and 24 hours for price offer purchase module procurements. It introduces a tiered clarification deadline structure requiring requests to be submitted 5 to 21 days before bid closure depending on the floating period, with mandatory responses no later than few working days before bid opening. It also sets binding calendar deadlines: annual procurement plans must be finalized and published by July 30, and annual performance reports submitted by August 30 (Ministry of Finance, 2025). This shift from vague procedural obligations to quantified, phase-specific time standards provides the institutional framework within which the post-implementation improvements in procurement cycle time measured in this study mainly in E-Planning and E-Tendering modules. Overall, this directive creates a predictable timeline within each bid cycle reducing both administrative delays and legal risks.

2.3.3. Procurement cycle challenges

To summarize below, the challenges from (ProQsmart, 2024) are:

- Complexity of procurements

- The requirements, importance, type, method, category, specifications

- Quality Control
  - Detailed rigorous methods should be used to ensure the specifications quality standards are met
- Policies and regulations
- Suppliers reliability
  - These are the players that determine the end of the procurement cycle. First suppliers should be well equipped with system knowledge and important trainings. There should be guidelines and polices for suppliers to make sure they are qualified and properly, timely deliver what is required of them
- Cost Instability
  - Determining quality amidst price fluctuation

2.3.4. Risks, Challenges, and Mitigating Strategies

2.3.4.1. Barriers to E-Procurement system effective implementation

The Digital edge of procurement faces many barriers in its way to achieve the technological leap in public procurement. (Amarapathy, Jayasena, & Ranadewa, 2013) research ranks barriers of bidding through E-Tendering in order as legal position and policies of E-Procurement, upper management support and company culture, ”Resistance to change”, IT infrastructure shortage, expensive IT systems, lack of technical expertise, E-Procurement knowledge/skilled personnel and business relationship with suppliers. The openness of employees/user acceptance is a common challenge as it affects users’ ability of understanding and grasping of the system even after repetitive trainings are given. These issues are further discussed in (Mastor & Azizan, n.d.) research. Both researches recommend the integration of the E-Procurement system should go hand in hand with the non-digitalized manual process. This is because procurement is a complex but relevant process in any institution that must be done in the utmost care. The studies also suggest suppliers to use it as a powerful tool to grow their business and use it as a competitive advantage in the market place. Additionally, Both point to end user active involvement in the e-

procurement process as key to achieve value. With these in mind, E-Tendering is guaranteed to facilitate the whole procurement process and minimizes costs.

The eGp system is totally dependent on internet connection for suppliers and WeredaNet for the procuring entities. It is not inclusive of people without digital literacy and internet connection. The system acceptance of its early stage can be described as rather unpopular due to "Resistance to change". (The World Bank, 2021) It is also noted that there's a training gap for both the procurement staff/users and the suppliers. According to a survey on the report (The World Bank, 2021), It was predicted that the system will probably result in more MSMEs (Micro, Small & Medium Enterprises) businesses. The adequacy of the infrastructure, resources, capacity of the system, capabilities of users and feasibility in our developing economy are the issues in question. These challenges impact on the procurement cycle time have to be explored to help the federal institutions use the system at full capacity.

There are three risks to look out for when using electronic procurement services to achieve better performance and value for money in accordance to (Amarapathy, Jayasena, & Ranadewa, 2013). These are openness in acceptance of electronic services, infrastructure and resource capability, and skilled employees & knowledgeable management. These factors are really important because the majority of taxpayers' money is used in these federal institutions, mainly procurement, a sector that should be a priority and have its cycles perfected. Hence, challenges can be overcome by creating incentives, communicating importance and providing knowledge, budgeting resources, modernizing the scale of electronic assets, focusing on regular staff trainings and policies to support all these.

2.3.4.2. Strategies to enhance the procurement cycle

The following summarize the strategies from (ProQsmart, 2024) as follows:

- Harness the systems competitive bidding features
- Continuous trainings for users
- Utilize backup methods
- Keep data reports
- Invest on suppliers and foster relationships
- Fully digitalize - Contracts(in process), payment

- Procurement management framework - Guidelines for monitoring regulation compliance

2.4. Conceptual Framework Diagram

The Conceptual Framework diagram shows how the Electronic Government Procurement (eGp) system affects Procurement Cycle Time. The modules of the system automate the procurement workflow to boost procurement efficiency and reduce delays. The framework is supported by the Resource Based View (RBV) theory considering staff competency as an important resource to the institution and the success of E-Procurement. Furthermore, the Transaction Cost Economics (TCE) theory explains the reduction of the transaction costs, such as time, labor, process and supplier search cost that reduce procurement cycle time, which aligns with the framework.

The procurement cycle time is the total time from procurement requisition to contract award. The eGp system modules utilization directly has an effect on procurement cycle time. Procurement Cycle Time as a dependent variable reflects the effects of the other variables.

Staff Competency serves as a mediating variable and explains the mechanism of E-Procurement module effect on cycle time. The Staff Competency variable measures employees technical knowledge, procurement experience and eGp system skills. Staff Competency having the mediator role is mainly because the implementation of the system doesn't automatically produce lower cycle time without human resources operating it. The system users capability of navigating through the system modules translates to an improved procurement cycle time.

The System Challenges variable determines the strength of the relationship effect of E-Procurement on cycle time. System challenges include server downtime, network connectivity and system bugs. These are a series of factors that come as a result of the module utilization and affect the strength of the path between the independent and dependent variable. The system challenges variable determines the boundary condition of the model.

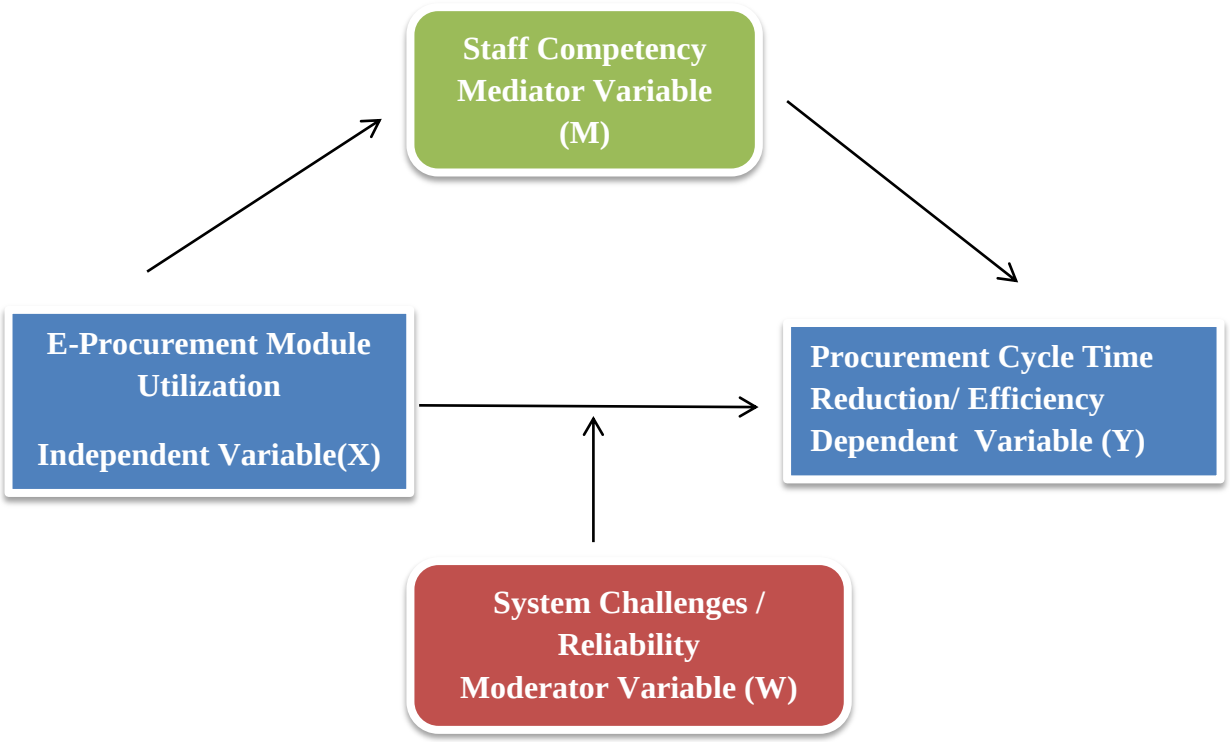


Figure 1: Conceptual Framework

CHAPTER 3

3. RESEARCH METHODOLOGY

3.1. Introduction

This chapter outlines the research methodology used to analyze the effects of the collective eGp modules known as Electronic Government Procurement system on Procurement Cycle Time (PCT) in the selected federal institutions. It incorporates the research design and approach, target population and sampling techniques, data collection sources and instruments, variables operationalization, data analysis models, data validity and reliability, data limitations, data quality and finally ethical considerations are discussed respectively to guide this paper to the objectives of the study.

3.2. Research Design and Approach

This paper uses explanatory research design because the thesis aim is to analyze the causal effect of the adoption of E-Procurement influencing procurement cycle time efficiency specifically in the selected federal government institutions. The causal effect between variables termed as explanatory research is used to explain the significance of the relationship between the variables to gain an explanatory response. (Saunders, Lewis, & Thornhill, 2019).

A deductive research approach which involves tests of a set theoretical framework (Saunders, Lewis, & Thornhill, 2019) is adopted in this study. It starts on the basis of the theoretical hypothesis from (Asian Development Bank (ADB), 2013) that electronic procurement systems fundamentally reduce procurement cycle time by digitalizing the traditional procurement process. This deductive theoretical base is then tested using mixed research approach. The

quantitative research analysis contains Likert scale ratings and numerical data of the procurement cycle time in days and qualitative analysis of open ended questions from the distributed surveys are used to model the causal relationship between the variables and explain the transition challenges.

3.3. Population and Sampling Techniques

This study focuses on a target population specifically comprised of registered, active and knowledgeable eGp system users in the selected federal institutions. The study uses homogeneous purposive sampling technique to select 30 federal institutions that are active procuring entities on the Ethiopian electronic government procurement (eGp) system. These institutions include ministries, regular authorities and technical agencies that have consistent digital procurement process and comparable procurement structures. This selection represents a significant portion of early adopters' population of (2021-2023) eGp system expansion phase for 74 institutions. (Tafesse, 2023) The staffs in these procuring entities have up to 5 years of experience of eGp. By focusing on these groups, this study has access to the eGp users with deep understanding of the system modules and rich E-Procurement experience.

A target population of 450 respondents was identified across these institutions. The sample size was determined using Yamane's formula with 95% confidence interval and 5% error margin.

Yamane'sformula:

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{450}{1 + 450(0.05)^2}$$

$$n = \frac{450}{2.125} \approx \mathbf{211.76}$$

The sample includes employees drawn from the selected institutions that are involved in the various stages of the procurement cycle to fulfill the roles assigned to them on the platform. The sample size determined by Yamane's formula is 212. A total of 250 questionnaires were distributed to satisfy the stated requirement and produce a robust statistical analysis.

3.4. Variable Definition

3.4.1. Independent Variable: E-Procurement Module Utilization

E-Procurement is the use of the Electronic Government Procurement (eGp) system to digitally facilitate the traditional procurement process. E-Procurement module utilization indicates the level of eGp system core module usage in the federal institutions. It is the independent variable causing the change in the procurement cycle time and its implementation in the selected federal institutions. It is tested to check if it explains the reduction in procurement cycle time.It is measured through the automation of the overall procurement workflow. The digital procurement system adoption is observed mainly on the following three modules:

- E-Planning is conducted by the public body starting from each need collection to publication of the Annual Plan on the eGp platform. (Ministry of Finance, 2025) . It is measured by the level of automation of this planning process.
- E-Tendering is the electronic bidding process that highly minimizes the strain from the traditional procurement work. (Cook, 2025) The implementation of the electronic tendering can be grasped by comparing the timespan differences from manual procurement to the eGp procurement cycle time records.
- E-Purchasing is the online purchase of “high volume and low value transactions” (Asian Development Bank (ADB), 2013) can also be determined by the contrast of the manual ‘pro-forma’ and ‘purchase order’ timespan against the streamlined implementation of electronic purchasing and quotation stages time span.

3.4.2. Dependent Variable: Procurement Cycle Time (PCT)

Procurement Cycle Time (PCT) is the total time from need identification /requisition to award of contract/notification date. PCT is an indicator that measures procurement cycle length and percentage of procurements completed within a standard procurement cycle time guideline. It is also an indicator of the percentage of purchase orders processed such as emergency and tight period orders. It can be concluded that PCT is a necessary key performance indicator (KPI). In this thesis, the PCT will be measured by the average procurement cycle (days). The facilitation

of the cycle duration indicates how well institutions and users adapt to the changing digital system conditions and procurement process from initiation to completion.

- Procurement Cycle Time: Time 0 (Requisition date) to Time 1 (Contract Award/notification date)

3.4.3. Mediator Variable: Staff Competency

The Staff Competency Variable explains the E-Procurement modules mechanism of effect on Procurement Cycle Time. It has a partial mediating role in the research model. It means that human resources are required to operate the eGp system to improve performance by minimizing delays. It is measured by the staff's training effectiveness, technical competency, eGp system understanding and system troubleshooting skills. It is the path tested between E-Procurement module utilization and Procurement cycle time reduction.

E-Procurement Module Utilization => **Staff Competency** => Procurement Cycle Time reduction

3.4.4. Moderator Variable: System Challenges

System Challenges variable is the boundary condition which determines the strength of effect of the relationship between the E-Procurement Module Utilization variable and the dependent Procurement Cycle time variable. It is measure the impact of system reliability, technical glitches and connection stability on procurement cycle time reduction. The interaction between module utilization and system challenges is tested.

E-Procurement Module Utilization x **System Challenges** => Procurement Cycle Time reduction

3.5. Data Collection Strategy

3.5.1. Questionnaire Structure

The questionnaire has multiple formats which are divided into the quantitative and qualitative section. The questionnaire starts with demographics and basic information collection. The relationship between the variables is assessed through the 5-point Likert scale. The before and after cycle time duration numerical data of the three main modules E-Planning, E-tendering and

E-Purchasing is also included. The qualitative section has open-ended questions to assess the effect of E-Procurement and its challenges directly from the respondents' response.

To ensure content validity, the instrument items were adapted from academic literatures, international procurement performance frameworks and Ethiopian procurement directives. The questionnaire items were carefully reviewed and modified to fit the Ethiopian federal institutions' electronic government procurement context. Furthermore, the instrument reliability and validity tests are within acceptable ranges.

The questions for the survey taken with questionnaire include five point Likert scales (strongly agree to strongly disagree), multiple choice selection and an open ended question.

3.5.2. Data Sources

The main data collection method is a structured questionnaire taken using distributed paper survey/ questionnaire and a Google form was used separately for initial pilot test of 12 respondents. The pilot test participants were selected from the same eGp user population and were excluded from the final study sample to avoid response contamination. Unclear question, logical flow and wording were refined from the pilot test feedback. The primary data is taken from the responses showcases the responses of electronic government procurement active users on various aspects of the systems impact on facilitating the procurement cycle and improving its time. The professional users also provide the actual procurement cycle time record directly taken from the system which is considered as a secondary data.

The population respondents include active eGp system roles such as, the Procurement officers and Technical experts: main operators of the modules, Procurement unit heads: managing and oversight throughout the cycle and Endorsing committee members: review evaluation results, validate awards. These employees from the selected institutions' procurement department serve as primary source because they have rich experience, direct knowledge of the transition from manual to digital procurement system, actively interact with the system for procurement and have the necessary system training. (Ministry of Finance, 2025)

3.6. Data Analysis Plan

The data analysis uses the mixed method analysis approach to examine the effect of the independent variable E-Procurement on the dependent procurement cycle time.

Descriptive statistics will be used to summarize demographic and basic information. The normality of the data will first be tested using the Kolmogorov-Smirnov and Shapiro-Wilk tests. If the tests have normal distribution, a paired t-test will follow. If the test is a non-normal distribution, a non-parametric Wilcoxon Signed-Rank Test will maintain the average and balance the outliers to test the procurement cycle time reduction by comparing the before and after E-Procurement transition.

A simple regression analysis is used to test the independent to dependent variable relationship statistical significance. The multiple regression analysis tests how the variables: E-Procurement Module Utilization, Staff Competency and System Challenges variables collectively predict impact on procurement cycle time. The mediation and moderation analysis are analyzed using Hayes PROCESS Macro. Mediation path analysis will be conducted to test the indirect effect of E-procurement module utilization on Procurement Cycle time through the mediating variable Staff Competency. A moderation test will determine if the System challenges variable control the strength of the direct effect path. Additionally, a thematic analysis is used to categorize open-ended responses into their grouped theme and analyze qualitative responses.

3.7. Data Validity and Reliability

For each of the variables items Cronbach's Alpha is used to test the reliability and internal consistency of the multiple constructs with reliability $\alpha \geq 0.70$ threshold. (Garth, 2008) The validity of the construct and factor are examined using Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Barlett's test of sphericity. KMO value > 0.50 and Barlett's test $p<0.001$ confirm a positive result. (Field, 2018)

The contents of this thesis are validated with an extensive literature review encompassing research topics covering the traditional procurement process, eGp pilot phases, eGp user satisfaction and other related studies globally specifically analyzing the relationship between e-procurement technology and procurement cycle time. The eGp system has Procurement

Management Information System, which is basically administration of reports at different phases of the E-Procurement process. The respondents of the questionnaire provide information taken directly from this system and the records are drawn from actual procurements executed. The respondents providing the data are employees of the federal government institution who regularly use the system to extract reliable system data reports. Additionally, the data validity is supported by different procurement officials, system support staff and also other experts at Federal Public Procurement and Property Authority (FPPA).

To maintain data integrity and minimize response bias, participants' anonymity was maintained throughout the data collection and reporting stages, which encouraged honest and transparent responses from procurement staff who may otherwise provide restricted answers due to institutional sensitivities. The overall analysis includes both the numerical data and systematic thematic analysis to ensure the strength of the data findings presented. The final results are correlated with existing research and reports on the subject matter. This thesis was also thoroughly reviewed by my advisor Dr, Gemechis Terfa (Phd.).

3.8. Data Limitation and Quality

Implementation of procurement cycle time measurement frameworks are often difficult in practice than in theory. The limitations include data availability, access and quality. The available data, mainly the manual procurement data is inconsistent and partial data especially when compared to the system recorded reports.

Furthermore, Long time workers provide data from memory and experience which has its own pros and cons to the reliability and subjectivity of the information. Some federal government institutions limit the data they provide due to privacy and security constraints while employees from these institutions give restricted responses due to workload and other reasons. (Audit Scotland; NHS Scotland, 2001). These factors also require costs to organize and interpret.

This thesis compensates for these limitations with reviews of closely researched literatures within this paper topic area, cross checking the data with references, involving various procurement experts from different federal institutions and data reorganization. Additionally, the sample frame of the 30 institutions represents the 74 early adopter institutions whose workers have long time procurement experience and demonstrated eGp system competency compared to

the late eGp system adopters. The data reflects more favorable procurement cycle time outcomes compared to newly registered and non-eGp system institutions. This study also leans towards most experienced and competent eGp system users which might have overestimated the system's procurement cycle benefits across institutions with varying level of experience of using the system, thus less experienced institutions may not achieve the same outcomes.

3.9. Ethical Considerations

The study follows the standard thesis guidelines and ethical considerations. The introduction of the Survey questionnaire informs respondents of the study's purpose and objective. The identities of the participants remain anonymous while participation is voluntary. Institutional confidentiality is maintained in both data collection and report stages. As a researcher for this thesis, I am committed to providing report of the findings even if the outputs are not desirable and do not match this paper narrative.

CHAPTER 4

4.1 INTRODUCTION

This chapter reports the analysis of the data collection results, hypothesis testing and examination of the relationship between E-Procurement System implementation and Procurement Cycle Time Reduction in selected federal procuring institutions.

4.2 Respondents Demographic profile

This section outlines background information and basic eGp information of the survey respondents. Besides the demographics, this section includes assessments to identify qualified procurement staff or eGp users that provide responses of the actual reflection of the system after full implementation. Descriptive statistics like Frequency and percentages were used to analyze the data categories.

General Category		Frequency	Percent (%)
Institution role	Procurement Officer	32	15.1
	Endorsing Committee	14	6.6
	Technical Expert	144	67.9
	Unit Head	22	10.4
Education level	Diploma	14	6.6
	Bachelor	164	77.4
	Master	34	16.0
Procurement experience	<2 Years	16	7.5
	2-5 Years	120	56.6
	6-10 Years	76	35.9
Active eGp experience	<1 Year	17	8
	1-2 Years	84	39.6
	3-4 Years	92	43.4
	>4 Years	19	9.0
Frequency of eGp usage	Daily	182	85.8
	Sometimes	30	14.2

Table 1: Respondents Demographic Profile

4.2.1. Response Rate

To conduct this study 250 questionnaire were distributed across 30 federal procuring institutions registered on the eGp platform. These federal government procuring entities are active eGp system users, such as Procurement officers, unit heads, endorsing committees and technical experts with considerable experience in procurement. With a response rate is 84.8%, 212 adequate responses were collected for analysis.

4.2.2. Institutional Role Distribution

The majority of the respondents are prominent users of the eGp system modules (Technical Expert (67.9%) and Procurement Officers (15.1%)).These roles are the main eGp platform modules: the E-Planning, E-Tendering and E-Purchasing modules that actively interact with the system. (Federal Public Procurement and Property Administration Agency, n.d) The remaining respondents holding roles of procurement approval and endorsement are 10.4% Unit Heads and

6.6% Endorsing Committees respectively. The survey responses of these personnel roles give insight into the effect of E-Procurement at different stages of the procurement cycle and systemic bottlenecks.

4.2.3. Education

Most of the participants have higher education sufficient to navigate through the system. The Bachelor Degree holders are indicated are 77.4% while the Master's degree holders are 16% and 6.6% are Diploma holders. This indicates most of the respondents have the qualifications to assess the eGp system performance.

4.2.4. Professional Procurement Experience

More than 56% of respondents have 2 to 5 years of experience, 35.9% of respondents have 6 to 10 years of experience and the remaining 7.5% have less than 2 years of experience in the procurement fields. The long years of experience in procurement shows most participants are experienced in both the manual and electronic procurement cycle and can attest to the changes in the workflow. Their practical skills help them identify the effect of the system integration and transition challenges.

4.2.5. Active eGp Professional Experience

Active eGp users are professionals who have hands on experience on the eGp system as indicated in the table above. 43.4% of the respondents have 3-4 years of experience, 39.6% of them have 1-2 years of experience and 9% of them have more than 4 years of experience of interacting with the system which shifts the survey participants to the experienced users capable of providing insightful and reliable responses on the eGp System modules.

4.2.6. Average eGp Transactions

Average eGp transactions are analyzed using central tendency measures like mean, median and max. The mean of the descriptive statistics indicates the average transactions processed by the respondents mean around 7 weekly transactions. The Median shows 5 transactions per week while the maximum transactions processed per week go as high up as 21 weekly transactions. Approximately 65% of the eGp users who responded, process up to 8 transactions per week. The

respondents reported large amount of transaction that they execute on the eGp platform. The frequency of the transaction indicates the respondents are familiar to the system and actively interact with the modules of the system.

4.2.7. Frequency of eGp Platform Usage

The frequency of eGp system usage demonstrates the familiarity to the system functions as well as issues. The data from this eGp usage frequency indicates that more than 85.8% are daily users and 14.2% use the system sometimes ("አልፎ አልፎ", as indicated in the questionnaire). These are regular users well adapted to the digital procurement functions and routine process. It also indicates they frequently process procurements with the modules of the system.

4.2.8. Perceived Percentage of Time Saved

		Frequency	Percent
Perceived Percentage of Time Saved	**<25%**	43	20.3
	25%-50%	51	24.1
	51-75%	25	11.8
	>75%	93	43.9

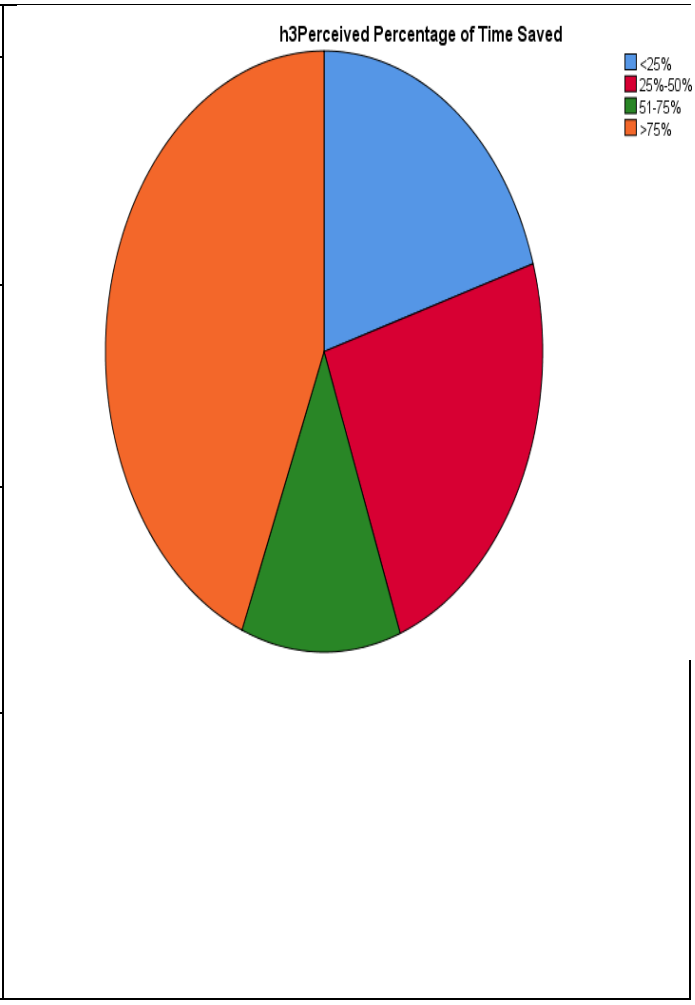


Table 2: Perceived Percentage of Time Saved

The respondents' perceived time saving due to the system implementation report indicates 43.9% of the participants system users believe the system has saved more than 75% of time along the E-Procurement cycle. 24.1% of the participants believe the system saves 25% to 50% of procurement cycle time. Additionally, 20.3% reported less than 25% and although a little lower 11.8% reported 51-75% of time saved. The result suggests the eGp system has reduced considerable delays in procurement operations and provided more efficiency after its implementation.

4.3. Reliability and Validity Test Results

4.3.1. Cronbach's Alpha for Reliability and Internal Consistency

This reliability test metric was conducted using Cronbach's Apha which ensures the trustworthiness of the findings taken from the survey. It assesses the internal consistency and reliability of multi-item scales of the constructs. (Garth, 2008) It examines the extent to which the items consistently measures of the constructs. A reliability coefficient of 0.7 or above is considered "acceptable". (Impact on PCT, Module Utilization, Staff Competency, and System Challenges)

Variables	Number of Items	Cronbach's Alpha	Interpretation
Impact on PCT	4	0.743	Acceptable
Module Utilization	4	0.898	Good
Staff Competency	4	0.725	Acceptable
System Challenges	2	0.933	Excellent
All Cases	14	0.876	Good

Table 3: Cronbach's alpha

The overall Cronbach's Alpha for the whole variable items is 0.876 which indicates the constructs Good to Excellent internal consistency in the survey. PCT with coefficients 0.743 and staff competency items with 0.725 coefficient are statistically consistent in measuring the reduction of the procurement cycle time and the professional capability of the staffs in operating the system respectively. System challenges items with excellent Cronbach's Alpha of 0.944

consistently display the hurdles that are faced across most institutions after the full system implementation. The high Cronbach's alpha for module utilization indicates the connection strength between the module's functionality to facilitate the procurement system performance speed. It can be concluded that the findings from the questionnaire are statistically acceptable to report the effect of e-procurement in federal procuring institutions.

4.3.2. Validity of the Instrument

The Kaiser Meyer Olkin (KMO) statistical tests along with Barlett's Test of Spericity are used to assess the validity of the instrument. The KMO statistics measures the adequacy of the sample and the extent variables are grouped into meaningful factors, while the Barlett's test examines the difference between the correlation and the identity matrix. A high KMO (1) value indicates the data suits the grouping or the correlation extent of the items and the variance proportion point to a single factor. It is also considered a reliable sample with well drafted result structure. (Field, 2018)

According to Kaiser's criteria, KMO value < 0.50 and Barllet's test of sphericity of $p < 0.001$ is unacceptable for factor extraction. All the variables factor analysis items results meet the set threshold and the minimum criteria. The tests confirm that the interrelations of the individual items represent the variable constructs and their shared factor explains the variation of the data to measure the same underlying concept.

Looking at the SPSS, the three extracted factors show strong joint representation in explaining 79.9% of the total variance after extraction. The three factors Module utilization, Staff competency & System challenge explained 50.017%, 17.643% and 7.316% of the variance on Procurement cycle time consecutively. The validity result confirms the questionnaire items correlation is statistically significant for factor analysis and the factors represent the variables.

4.4. Descriptive Analysis of the Constructs

	Item constructs	**Mean**	**Std. Deviation**
1. Impact on PCT	Since adopting the eGp system, our institution has seen a significant reduction in overall procurement cycle time, specifically from the initial need identification	3.89	0.586

	through to the final contract award.		
	Automated workflows have decreased the duration of the internal approval process compared to manual paperwork.	4.18	0.686
	The e-procurement system has streamlined evaluation and documentation processes, leading to faster procurement cycles.	4.14	1.069
	Digitalization has reduced the paper-heavy administrative workload delays found in traditional procurement cycle.	3.80	0.914
2. Module Utilization	The end-to-end integration of eGp modules ensures a seamless digital workflow, eliminating information bottlenecks throughout the entire procurement lifecycle.	3.27	1.011
	The digitalization of bid solicitation and evaluation through the E-Tendering module results in a faster, more agile tendering cycle compared to traditional paper-based methods.	3.92	1.046
	The E-Planning module automates the consolidation and publication of departmental needs, significantly reducing the duration of the planning and approval stage.	3.59	1.142
	The E-purchasing module optimizes transactional speed and facilitates the issuance of high-volume, low-value purchase orders.	3.34	1.188
3. Staff Competency	Procurement staffs in my institution have the necessary technical proficiency to navigate eGp modules without external assistance.	3.74	0.951
	I have received adequate training to use the eGp system confidently, which contributes to shorter processing times for procurement requests.	3.84	0.787

	The technical language or terminologies within the eGp system interface are clear and easy to understand, reducing the time required to complete bidding documents.	3.54	1.018
	Staffs in my institution demonstrate a high level of digital literacy, allowing them to troubleshoot technical errors and complete digital procurement tasks without frequent mistakes.	3.84	0.787
4. Challenges	The eGp system consistently performs reliably, with minimal downtime or server speed issues, supporting timely procurement activities.	3.40	0.845
	The eGp system maintains a stable connection without unexpected session timeouts or system crashes during critical procurement transactions.	3.21	0.712

Table 4: Descriptive Statistics for Key Constructs

The overall result demonstrates respondents' agreement to eGp's role in reducing the procurement cycle time and facilitating procurement activities. There is comparatively higher agreement for the E-Procurement system automated workflows reducing the approval process compared to manual procurement (mean=4.18) and streamlined procurement processes resulting in improvement of procurement cycle speed (mean=4.14). The responses indicate the E-Procurement is the 'Digital Edge' that has transformed the manual procurement process. E-Tendering has the highest agreement (mean=3.92) of resulting in a more agile procurement cycle compared to the other modules utilized. An agreement is also seen for staff competency having training to independently operate the system that results in shorter procurement cycles (mean=3.7, 3.8). System challenges scores show moderate to agree on system performance consistency (mean=3.4).

E-Procurement reducing traditional paper based workflow has a lower mean (mean=3.8) in reducing cycle time. Module utilization also has a lower mean (mean=3.27) for seamless workflow that eliminates information bottlenecks in the procurement cycle and moderate mean (mean=3.34) on the E-Purchasing module optimizing purchasing procurement cycle time. Staff

competency of understanding of eGp language and terminology to reduce the procurement completion time also has a lower mean score (mean=3.54). The lower mean score for system challenges is instability of the system connection (mean=3.21).

The responses of the respondents on the impact on procurement cycle time section indicate that the system integration into the procurement workflow has indeed decreased approval bottlenecks and paper intensive processes. E-Tendering stands out as the eGp module that transformed the cycle from the traditional bidding process. The staff competency result suggests the staffs are adapting to navigating the system at a fairly agreeable stance. However, the moderate agreement on E-Purchasing module improving the speed of procurement suggests there are gaps that drawback the automated pro forma/purchasing procurement that needs closer attention. The lowest mean score on system and technical challenges clearly indicate the existence of considerable system bottlenecks that need to be addressed.

The high standard deviation with moderate mean values on the reduction of paper based workload, the stance on E-Purchasing facilitating procurements and system navigation understanding indicate experience differences across institutions. Overall, the variables mean observed on Procurement cycle time reduction support the Transaction Cost Economic (TCE) theory which focuses on cost minimization such as transactional, operational, labor and resources similar to the observation on the E-Procurement system. In general, the system significantly improves the cycle achieving the 'Digital Edge' of modern procurement in federal institutions.

4.5. Comparative Analysis of Procurement Cycle Time: Manual vs. eGp Era

Firstly, data distribution analysis was conducted to check for normality using the Kolmogrov-Smirnov and the Shapiro-Wilk tests for each module. Its result had significance value below the threshold ($p<0.05$) which means the comparative data is not normally distributed. This indicates, there are outliers seen in the data that may be attributed to the different levels of user experience, eGp practice, openness and procurement complexity in the federal institutions. Because of this a non-parametric test like Wilcoxon Signed- Rank test is used to compare the before and after of

the procurement cycle times. This test maintains the average despite the outliers to measure the difference for each of the cases.

Hypothesis tested:

H_0: There is no significant cycle time reduction in the transition from the manual era to the eGp system

H_1: There is a significant cycle time reduction in the transition from the manual era to the eGp system

- **Tendering:** The output ($Z=-12.579$, $p<0.001$) shows high improvement in reduction of cycle time because before E-procurement manual tendering processes like bid publication, preparation, evaluation and award of contract were tedious and time consuming. The result suggests an effective use of E-tendering has facilitated the bidding workflow and minimized delays in the institutions with score greater than all the other modules.
- **Annual Planning:** The output ($Z= -12.527$, $p<0.001$) shows considerable procurement cycle time reduction and improved paper based workflows after the eGp implementation. More than 95% of the responses confirm this. It is important because planning is the base for all the other procurements.
- **Purchasing/Pro-forma:** The output ($Z=-9.672$, $p<0.001$) shows comparatively lower score which means while the majority result indicated an improvement in cycle time, few responses show variation which implies there is an underlying technical or operation gap to be further researched.

The results collectively demonstrate that the manual procurement era of non-eGp system users indicates delayed procurement cycle time in each of the three E-Procurement modules. Unnecessary procurement cycle workflow paths are taken when procuring without using the E-Procurement system such as long approval time, physical supplier search cost, paper-based transactions, reduced ‘value for money’, erroneous procurement management and various environmental constraints that slow down and hinder the procurement process (The World Bank, 2021). Since a majority of the public budget passes through public procurement, a more efficient procurement system has an upward ripple effect on national economic growth. In contrast, the

findings indicate transactional cost saving E-Procurement platform that significantly transforms the procurement cycle and provides the digital edge using various modules essential to achieve strategic goals of the institution.

Overall, the results of Wilcoxon Signed- Rank test of the before and after eGp adoption is positive and lead to reject the null hypothesis and accept the hypothesis that is, there is a significant cycle time reduction (α level <0.05) in the transition from the traditional paper based procurement to the systemic digital procurement. It can then be concluded that all three modules have streamlined the procurement workflow, performance, and efficiency, achieving the 'Digital Edge' of modern procurement. The transition from paper based process give access to more than 100,000 active suppliers competitive environment in different sectors that improves value for money and fast delivery of procurements to the institutions. Furthermore, the system reduces procurement cycle time and high transactional costs such as time, labor and monetary costs. It also simplifies the auditing and procurement record keeping process through the eGp system's integrated report of each procurement transaction.

4.6. Simple Regression Analysis

Simple Regression is a statistical tool used to test the relationship between independent and dependent variable. It can predict the relationship by producing a regression equation and confidence interval (Elliott & Woodward, 2016) This model analyzes the direct causal relationship of how the E-Procurement system implementation impacts the procurement cycle time reduction and procurement efficiency in Ethiopian federal institutions. It evaluates how the E-Procurement module utilization reduces delays in the procurement cycle.

Hypothesis tested:

H0: There is no statistically significant relationship between E-Procurement module utilization and Procurement cycle time reduction.

H1: There is a statistically significant relationship between E-Procurement module utilization and Procurement cycle time reduction.

4.6.1. Bivariate Correlation(R) and Coefficient of Determination (R^2)

The Pearson correlation coefficient (R) between the E-Procurement modules utilization and the Procurement cycle time is 0.784 and p<0.001, which indicates a positive relationship and direct proportionality. (Elliott & Woodward, 2016) This reveals the more the system modules are implemented, the more procurement cycle is efficient and its time is reduced. The relationship between these two variables is statistically significant and the null hypothesis is rejected. Therefore, higher level of eGp system modules utilization produces shorter and effective procurement cycles. The two variables together contribute to the federal institutions performance improvement and efficient procurement budget expenditure.

	Variable	Impact on Procurement Cycle Time	E-Procurement Utilization	Mean	Std. Deviation
Pearson Correlation	Impact on Procurement Cycle Time	1.000	0.784	4.0012	0.62718
	E-Procurement Utilization	0.784	1.000	3.5609	1.00823

Table 5: Bivariate Correlation

The coefficient of determination (R^2) value 0.614 and the Pearson correlation(R) value 0.784 indicate positive linear relationship. This regression model indicates that the E-Procurement module utilization accounts for and explains 61.4% of the procurement cycle time variance. A variance above 60% is considered strong and statistically significant in academic research. (Elliott & Woodward, 2016) The residuals show no autocorrelation as indicated by the Durbin Watson statistic (1.838). Overall the model fits the data well and the independent variable is a strong predictor of the dependent variable.

Model	R	R^2	Adjusted R^2	Std. Error of Estimate	Durbin Watson
Value	0.784	0.614	0.612	0.39108	1.838

Table 6: Simple Regression: eGp module utilization -> Procurement Cycle Time

4.6.2. Analysis of Variance

The ANOVA output determines the statistical significance of the regression model. The F-statistic result in the ANOVA table has p value <0.001. Therefore, this model proves the relationship is far from random chance and that E-Procurement module utilization variable has positive effect on the procurement cycle time.

ANOVA	Sum of Squares	Df	Mean Square	F-statistic	Significance(p)
Regression	51.069	1	51.069	333.903	<0.001*
Residual	32.118	210	0.153		
Total	83.187	211			

Table 7: ANOVA table for Simple Regression

4.6.3. Regression Coefficients and Equation

Model	Unstandardized B	Standardized Beta (β)	t-value	Significance (p)
(Constant)	2.195	-	21.421	<0.001
E-Procurement Module Utilization	0.512	0.784	18.273	<0.001

Table 8: Simple Regression Coefficients

Regression Equation:

Impact on Procurement Cycle Time = 2.195 + 0.512 * E-Procurement Module Utilization

The positive regression coefficient is statistically significant to show that the E-Procurement module utilization positive effect on procurement cycle time reduction. The slope (B=0.512) indicates for a one unit increase of module utilization, the impact on procurement cycle time improvement increases 0.512 units. Overall the predictor variable is highly significant (t=18.273, p<0.001).

The regression equation shows direct positive proportionality between the two variables. The model has a normal curve and residuals within the standard limit. The positive intercept value (2.195) suggests that there exists procurement cycle efficiency even under low module utilization.

The residual values range lies on an acceptable range of (-1.866 to 1.940). The Variance Inflation Factor (VIF) value of 1 which is below the required threshold (10) indicates there is no multicollinearity problem. The residual graphical representations also showed normal distribution of the model. The regression model displays statistically significant relationship between the independent and dependent variables and the null hypothesis is rejected. Therefore, as module utilization increases more procurement cycle time will be reduced.

4.7. Multiple Regression Analysis

This model analyzes the three variables i.e. Module Utilization, Staff Competency and System Challenges impact on Procurement Cycle Time, which are the multiple predictors for the dependent variable. (Elliott & Woodward, 2016) The analysis shows a positive causal relationship between the variables and on the dependent variable. It explores the effect of human-system interaction combined with the users' technical skills and the underlying system issues on reduction of procurement cycle time.

Hypothesis tested:

H0: E-Procurement module utilization, Staff competency and System challenges do not significantly reduce the procurement cycle time

H1: E-Procurement module utilization, Staff competency and System challenges significantly reduce procurement cycle time.

The correlation analysis demonstrates that the relationship of the two variables: staff competency and procurement cycle time as strong and significant while the system challenges variable correlation output is a negative relationship.

	Variables	Impact on Procurement Cycle Time	E-Procurement Module Utilization	Staff Competency	System Challenges	Mean	Std. Deviation	Sig.
Pearson	Impact on Procurement Cycle Time	1.000	0.776	0.883	-0.078	4.0769	0.62718	<0.05

	E-Procurement Module Utilization	0.776	1.000	0.668	-0.423	3.5609	1.00823	<0.05
	Staff Competency	0.883	0.668	1.000	-0.237	3.8301	0.68316	<0.05
	System Challenges	-0.078	-0.423	-0.237	1.000	3.2885	0.79576	0.250

Table 9: Multiple Regression model summary

4.7.1. Multiple Correlation Coefficient(R) and Coefficient of Determination (R^2)

Coefficient of Determination (R^2) measures the performance of the multiple regression. (Elliott & Woodward, 2016) The previous linear regression model is further strengthened with the other variables. The multiple correlation coefficient (R) 0.951 demonstrates the significant prediction effect of the combined variables and coefficient of determination (R^2) value 0.905 demonstrates the three variables together impact 90.5% of the variance in the procurement cycle time results while the other 9.5% are other external factors. With the Durbin Watson statistic of 2.103 indicates the residual do not show any significant auto correlation. It suggests that the regression model is a good fit and the variables provide a considerable explanation for the dependent variable variance.

Model	R	R^2	Adjusted R^2	Std. Error of Estimate	Durbin Watson
Value	0.951	0.905	0.904	0.19463	2.103

Table 10: Multiple Correlation Coefficient(R) and Coefficient of Determination (R2)

4.7.2. Analysis of Variance (ANOVA)

The F-statistic with the low significance ($p<0.001$) confirms the variables together strongly determine the changes on procurement cycle time results. It also indicates, the multiple regression model is statistically significant. The residuals or the difference between actual and predicted values is normally distributed that confirm the multiple regression model is statistically significant and the significance is reliable.

ANOVA	Sum of Squares	Df	Mean Square	F-statistic	Significance
Regression	75.308	3	25.103	662.647	<0.001
Residual	7.880	208	0.038		
Total	83.187	211			

Table 11: ANOVA table for Multiple Regression

4.7.3. The Regression Coefficients and Equation

Variables	Unstandardized B	Standardized Beta (β)	t-value	Significance (p)	Collinearity (VIF Range)	`Standard Error
(Constant)	-0.104	-	-0.923	0.357		0.113
E-Procurement Module Utilization	0.318	0.487	14.394	<0.001	2.516	0.022
Staff Competency	0.578	0.607	19.647	<0.001	2.095	0.029
System Challenges	0.249	0.300	12.329	<0.001	1.298	0.020

Table 12: Multiple Regression Coefficients

Regression Equation:

Impact on Procurement Cycle Time = -0.104 + 0.318 E-Procurement Module Utilization + 0.578 Staff Competency + 0.249 System Challenges

The multiple regression equation predicts the dependent variable from the variables and describes the relationship between them. (Elliott & Woodward, 2016) The equation signifies a one unit increase for each predictor variables: module utilization, staff competency and system challenges improve the impact on cycle time by 0.318, 0.578 and 0.249 units respectively. Variance Inflation Factor (VIF) was computed to check the linear relationship strength of the correlation of the predictors or their multicollinearity. (Field, 2018) The model passed with all VIF scores ranging from 1.298 to 2.516 which are less than the acceptable threshold 5, thus the multi-collinearity bias is not significant.

The eGp platform modules solely do not impact the efficiency on the procurement cycle. The negative intercept means that if all the independent variables are zero the regression doesn't produce statistical outcome. In this model, the staff competency variable is the strongest predictor increasing the efficiency of the procurement cycle 0.578 units for its one unit increase. It suggests the proficient users who have sufficient system knowledge, skills and experience highly impact procurement performance improvement.

The system challenges variable direct effect shows a negative correlation with procurement cycle time ($r = -0.078$, $p=0.250$) in the bivariate correlation table. But, in the multivariate correlation table, its value ($B=0.249$, $p<0.001$) indicate its highly significant effect on the dependent variable. This implies, despite institutions facing system challenges, the digital procurement process continues to strive and operate at a faster speed when it's supported by effective module utilization and competent staff.

In general, the multiple regression of the predictor variables on the dependent variable is statistically significant and the null hypothesis is rejected.

4.8. Mediation and Moderation Analysis

The research report below examines the mechanism of impacts that E-Procurement Module Utilization has on Procurement Cycle Time. The analysis is mainly focused on the roles played by the key variables: Staff Competency and System Challenges.

Independent Variable (X): E-Procurement Module Utilization - measures the eGp system adoption and usage of the modules

Dependent Variable (Y): Procurement Cycle Time - measures the total time required to complete a procurement cycle.

Mediator Variable (M): Staff Competency - The E-Procurement skill, experience and knowledge of active procurement department eGp users.

Moderator Variable (W): System challenges - The technical issues of the eGp system such as server connectivity & timeout, system speed & downtime, bugs & errors)

4.8.1. Mediation Analysis

A mediation path analysis was conducted on the Staff Competency variable. It examines the mechanism through which the independent variable affects the dependent variable. The main aim is to understand the intervention of the staff competency variable among the variables. The causal mechanism/ path of E-Procurement Utilization on Procurement Cycle Time were executed using Andrew Hayes PROCESS Model 4.

4.8.1.1. Staff Competency as a Mediator

The analysis of staff competency as an intermediate between the E-Procurement module utilization and Procurement cycle time efficiency evaluates the underlying mechanism of the digital effect. The Staff Competency mediation test revealed a significant complementary Partial Mediation effect. Both linear hierarchical regression with the added system challenges variable (multiple regressions) test and Hayes PROCESS Macro results showed identical coefficient pathways.

Mediator Variable: Staff Competency

Hypothesis tested:

H0: Staff Competency significantly does not mediates the relationship between E-Procurement module utilization and Procurement Cycle time reduction

H1: Staff Competency significantly mediates the relationship between E-Procurement module utilization and Procurement Cycle time reduction

Path	Relationship	Unstandardized Coefficient (B)	Standard Error (SE)	t-statistic	p-value	95% Confidence Interval(OLS)
Path a	E-Module Utilization -> Staff Competency	0.4890	0.0332	14.7295	<0.001	[0.4236, 0.5545]
Path b	Staff Competency -> Cycle Time Reduction	0.6398	0.0380	16.8290	< 0.001	[0.5649,0.7148]
Path c’	E-Module Utilization -> Cycle Time Reduction(direct effect)	0.1988	0.0261	7.6233	< 0.001	[0.1474, 0.2502]

Path ab	E-Module Utilization -> Staff Competency -> Cycle Time Reduction(indirect effect(a*b)	0.3129	0.0388	-	-	[0.2474, 0.3978] [Bootstrap]
Path c	Total Effect (direct effect + indirect effect)	0.5117	0.0321	15.9329	<0.001	[0.4484,0.5750]

Table 13: Mediation analysis: Staff competency as mediator (Indirect effects)

The Bootstrap confidence interval doesn't include zero and positive values of the indirect effect confirm the partial mediation effect is statistically significant. The Model Fit summary ($R=0.9144$, $R^2 = 0.8361$, F statistic = 533.92, $p<0.001$) of the outcome variable demonstrates a strong predictive correlation between the variables. The model is also statistically significant and explains 83.61% of the variance in Procurement cycle time reduction.

The mediation role of staff competency is highly significant. The null hypothesis is rejected. The value of the direct (Path c') effect and the indirect (Path ab) effect both have positive confidence interval which means this model, that demonstrates partial indirect effect is statistically significant. The module utilization improves procurement cycle time directly ($B=0.1988$, $p<0.001$). Its impact is however enhanced through staff competency i.e. 0.6398 units procurement cycle time improvement with the every unit added on staff competency. The indirect effect (0.3129) is greater than the direct effect (0.1988), which also shows it is not just the development of the system but also with the strengthening and development of human capital competency on the eGp platform that procurement cycle becomes more efficient. Staff competency is the major pathway through which E-procurement modules minimize the procurement cycle time confirming its partial mediation role.

In the context of the Resource based view, staff competency in E-Procurement can be viewed as a valuable resource to the federal institutions that provides a unique advantage to achieve the digital edge in E-procurement and to operate under reduced procurement cycle time. Competent staff can leverage the eGp system functionalities to improve the procurement cycle.

4.8.2. Moderation Analysis (Boundary Condition)

A moderation path analysis is used to identify the conditions under which the system modules usage achieve considerable reduction on the procurement cycle time. To examine the scenarios/

conditions under which the independent variable affects the dependent variable, a moderation analysis test was executed using Model 1 of Andrew PROCESS Macro test and ensuring statistical validity yielded significant output.

4.8.2.1. System Challenges as a Moderator

The System Challenges was tested as a moderator to analyze the effect of system challenges, how it predicts the procurement cycle time variable and tests their interaction relationship.

Moderator Variable: System Challenges

Hypothesis tested:

H0: System Challenges significantly doesn't moderate the relationship between E-Procurement module utilization and Procurement Cycle time reduction.

H1: System Challenges significantly moderates the relationship between E-Procurement module utilization and Procurement Cycle time reduction.

Relationship Path	Unstandardized Coefficient (B)	Standard Error (SE)	t-statistic	p-value	95% Confidence Interval
E-Procurement Module Utilization (Direct Effect)	0.6369	0.0251	25.3431	< 0.001	[0.5873, 0.6864]
System Challenges(Moderator)	-0.7563	0.0525	-14.4179	< 0.001	[-0.8598, -0.6528]
Module Utilization x System Challenges	0.5043	0.0350	14.4179	< 0.001	[0.4353,035732]

Table 14: Moderation Analysis: System Challenges as moderator (Interaction effects)

These results confirm that the System Challenges variable significantly moderate the effect of E-Procurement Module Utilization on reducing Procurement Cycle Time. The null hypothesis is rejected. The negative interaction coefficient (B=-0.7563) indicates System challenges negatively impact the procurement module utilization. It also decreases the positive effect of E-Procurement modules as seen on the interaction term (B=0.5043, $p<0.001$). However, the positive coefficient indicates high level of module utilization as a buffer, partially suppress and mitigate the negative impact of system challenges. (Elliott & Woodward, 2016)

The model fit ($R=0.8706$, $R^2=0.7579$, $p<0.001$) of the system challenges interaction with module utilization is highly significant and explains 75.79% of the variance on procurement cycle time. Generally, the findings signify System Challenges as a critical boundary condition for E-Procurement cycle time reduction and overall eGp performance. The E-Procurement cycle efficiency is heavily reliant on underlying system reliability. However the results also suggests robust procurement utilization process through continuous adaptation and active module navigation resolving system constraints enables the institutions to utilize the digital tools for boosting the procurement cycle speed and overcoming system issues. It can be concluded robust and continuous module usage prevents the system challenges and procurement cycle delays.

4.9. Qualitative Data Analysis: the Manual to Digital Procurement Transition Challenges

The Manual Era had workflow delays caused by paper based processes, manual approval, mathematical calculation errors. Respondents highlighted that the majority of the issues of the traditional procurement have been resolved but also have been replaced by other factors. These factors are the compiled responses on the open ended questions of the survey.

Technical & Infrastructure Limitations

- **Server Network & Internet Connection issues -** This is listed as the major factor for the delays in the procurement cycle by most participants (58%).
- **System Reliability & Technical Infrastructure problems** – this includes recurrent system bugs, database constraint, and unreliable internet service (WeredaNet) heavily drawback the system's progress.
- **Insufficient & Delayed Technical Support -** It is mainly shortage and lagged support on the system when the procurement staff run into technical bugs and errors.

Supplier-related challenges

- **Post Award Delivery Refusal** - It is the winner bidder refusal to deliver the awarded procurement goods, service or work, especially on high volume low cost E-Purchasing procurement. It is a highly stressed issue by 33% of the respondents.

- **Digital Literacy Gaps** – It is the lack of technical competency to navigate the system on the suppliers' side directly affects the procurements in the institutions.
- **Supplier Accountability & Credibility –** It is some suppliers lack a permanent business location and verifiable business address. This makes it difficult to enforce contracts and contact the supplier at convenience.
- **Sample submission Delays -** Bidders do not bring samples physically or on time. This waiting process pause the evaluation stage.
- **Incomplete Documentation** – Suppliers fail to upload basic documentary evidence and specified document requirements delay the evaluation milestone.

Administrative & Regulatory challenges

- **Approval & Decision Making Delays -** It is procurement approvers especially Procurement Endorsing Committees lack of urgency, prolonged decisions, and their view of their system roles as a secondary task. This also includes E-Purchasing approval bottle neck that slows down the streamlined digital workflow for emergent and volume procurements.
- **Market Price Verification Mandate -** The Federal institutions are required to verify the bid price against the market price before awarding of a contract.
- **Policy Gaps & its misalignment with the system** – some mandates getting in the way of a seamless digital procurement workflow.

Price Fluctuations

- **Price Volatility –** It is the economy fluctuation effect on the procurement cycle
- **Shifting Market Prices –**the price of procurements changing in the life cycle of the procurements before reaching the final stage. This includes the running out of the bid price validity period.

4.10. Findings

This study analyzed the effect of E-Procurement module utilization on Procurement Cycle time reduction. It also tested the role Staff competency and System utilization play between the independent and dependent variables.

- The Descriptive analysis indicates the respondents have good educational background, relevant procurement experience and active eGp system usage which make them eligible to evaluate the effect of the transition from manual to digital procurement, assess the reduction in procurement cycle time and identify challenges. Most respondents are active users that execute large volume of transactions frequently. This shows that the system is well integrated to the procurement workflows at different stages of the procurement cycle. The respondents reported significant amount of procurement cycle time has been reduced due to automated modules that confirms the eGp system has streamlined the procurement cycle. In addition, the findings reflects the state of early adopter institutions with up to 5 years of system experience has produced human resources capable of navigating the system and mature E-Procurement stage category of institutions.
- The outcome of the responses can generally be considered as agreement especially to the reduction in procurement cycle time due to system integration into the procurement workflow and E-Tendering module utilization facilitating the procurement cycle. Furthermore, there is moderate agreement for Staff having training to independently navigate the system efficiently and reduced paper based workflow after the transition to E-Procurement. However, there is a lower mean score regarding system issues. These finding suggests that improving the system reliability, deeper understanding of the system, more technical support and strengthening the other modules especially E-Purchasing will further reduce the procurement cycle time. Overall, the majority agree the eGp system has indeed significantly reduced the procurement cycle delays systematically by the automated workflows, digital approvals and capable staff.
- The comparative analysis between the manual and digital procurement systems was tested using Wilcoxon Signed Rank Test of all three modules showed a significant cycle time reduction. The Tendering module stands out as having a greater improvement from the digitalization of procurement followed by the Planning module. However, the

Purchasing module shows comparatively lower score indicating underlying limitations. Overall, the results confirm eGp system adoption and implementation improve the manual procurement and function as an important asset to the selected federal institutions in improving efficiency and reducing cycle time.

- The simple regression model is statistically significant which implies eGp module utilization has a positive effect on procurement cycle time reduction. The eGp modules: E-Planning, E-Tendering and E-Purchasing modules hold integral parts of the system that improves the procurement cycle and explain the reduction in cycle time.
- The multiple regression indicates the three variables: E-Procurement module utilization, Staff competency and System challenges together are strong predictors for reduction of procurement cycle time in the selected federal institutions. Higher standardized beta score of Staff competency shows it is the strongest predictor of procurement cycle time followed by module utilization. Thus, the success of the implementation of the E-Procurement system is highly dependent on human resources. The change of the system challenges variable from negative on the bivariate correlation to positive on the multivariate correlation suggests system challenges independently has no direct effect but thrives when supported by competent staff and effective module utilization variables to improve system reliability and performance. In conclusion, competent human resources, effective usage of module, continuous system interaction and system challenges management combined reduce procurement cycle time.
- The partial mediation role of Staff competency indicates the effect of E-Procurement is more efficient with competent staffs that contribute to the reduction in cycle time. Skilled staffs play an important role in the success of the eGp system even more than the system modules. The indirect effect was greater than the direct effect, which demonstrates staff competency enhances the efficiency of the procurement cycle. As module utilization increase, it produces more capable staffs on the eGp system that result in an improved and streamlined procurement cycle. In general, E-Procurement module utilization has both direct and indirect effect on procurement cycle time reduction.
- When looking at the moderation role of system challenges variable in the relationship between E-Procurement and Impact on procurement cycle time, it negatively determines the effect on procurement cycle time reduction. But, this negative effect of the system is

shadowed when module utilization increases. When eGp users continuously utilize the system modules, they become more familiar to the system and better equipped to deal with the system challenges.

CHAPTER 5

5.1. INTRODUCTION

5.1.1. Discussion

5.1.1.1 E-Procurement module utilization direct Effect on procurement cycle time

The results demonstrate the simple regression of Module Utilization direct effect on Procurement cycle time reduction is statistically significant (R^2=0.614, P<0.001) and accounts for 61.4% of the variance in PCT reduction. The slope (B=0.512) indicates the increase of E-Procurement module utilization directly translates to shorter procurement cycles. This direct relationship confirms the positive effect that E-Procurement cycle has on reducing cycle time. Procurement cycle time is considered as a key performance indicator of the time from the institution departments requisition of procurement up to award and supplier delivery of the procurement. Factors that affect the procurement cycle time is the procurement module types based on the procurement regulations. The combination digitalization of the procurement modules with reservation of suppliers' resources and services results in 22% reduction of the average procurement cycle time. (Asgharia, Rostambeygi, Hosseini, & Motamedib, 2022). Furthermore, Implementation of the eGp which is described as optimal level of procurement practices increases procurement performance by minimizing manual procurement processes. (Agbeka, Quagrainie, & Kabalan, 2024)

5.1.1.2. Staff Competency as a Mediator

Staff competency as a mediator variable enhances the effect of E-Procurement module utilization on procurement cycle time according to the staff competency indirect effect results. Staff competency predicts 83.61% of the variation on procurement cycle time. The indirect effect of staff competency (B=0.3129) is greater than the direct effect of module utilization (B=0.1988), which proves the eGp modules without competent staff independently can not achieve reduced cycles. (Smadi & Ababneh, 2018), suggests that competent staff who can handle system issues are needed for E-Procurement adoption. Additionally, highly skilled employees are important to develop and implement systems.

The findings also relate with (Wernerfelt, 1984) paper which describes knowledge of technology and skilled personnel as resources that contribute to the organizations performance. Module utilization can be categorized as a tangible system resource and staff competency as intangible resource. The intangible human resource skills not only are necessary to operate the E-procurement modules but also utilizing them to produce shorter procurement cycle time. The digital proficiency of these eGp users also reflects on minimized system errors, faster approvals and tangible procurement outcomes.

5.1.1.3. System Challenges as a Moderator

The moderation result of system challenges indicates that it explains 75.79% of the variance on procurement cycle time. The unstandardized coefficient (B=-0.7563) of the moderator is negative, which shows the system challenges variable negatively impacts the effect of E-Procurement module utilization on procurement cycle time. This demonstrated unreliable system with server issues, technical bugs and unstable connection delays the procurement cycle workflows similar to the systematic review of public E-Procurement in (Mohungoo, Brown, & Kabanda, 2020) study, where technological challenges were found to restrain the effectiveness of E-Procurement systems. The review classifies the system challenges as Technology Organization Environment (TOE) framework and the E-Procurement system technical aspects. It also notes that these system challenges need to be addressed to reduce the procurement cycle delays. If they are not addressed, it states that the technical challenges cause problem with transactional costs, employee motivation and improvement of the eGp system,

However, the positive interaction term output of module utilization (B=0.5043) indicates that increasing module utilization suppresses the effect of the moderator and boosts the procurement cycle time speed. This is confirmed with the Diffusion of Innovation (DOI) framework in (Apleni & Smuts, 2020). It demonstrates, in the implementation phase of a digital system, active usage of the system produces digital adaptation and technical issues navigation that limit the effect of system challenges.

5.1.2. E-Procurement module Utilization and its effect on procurement cycle time reduction

5.1.2.1. E-Tendering E-Procurement module

This study's comparative analysis of the manual and electronic procurement cycles, the result (Z=-12.579, p<0.001) confirmed E-Tendering has the most improvement in the reduction of procurement cycle time. The E-Tendering module has a high agreement (mean= 3.92) compared to the other modules with regards to transforming the electronic bidding cycle to speed up E-Procurement performance. (Wako, Oteki, & Abillah, 2024), also carried out the analysis and the results were significant and E-Ordering explained 43.7% of the variance of the tendering cycle.

The main goal of the E-Tendering module is to lower manual procurement struggles and increase the bidding process performance. (Amarapathy, Jayasena, & Ranadewa, 2013) . This literature highlights the module saves time and cost through minimizing the paper based processes like printing, copying, manual signatures, publications, evaluation and so on. It also goes on to project ultimately E-Tendering can accomplish a sustainable environment that reduces time, cost and resources. This is further elaborated on (Elias, Mahidin, & Shiratuddin, 2003), that showed the transition from manual procurement to the E-Tendering system improved the procurement cycle time by 58.5%. The digitalization of the bidding cycle has produced positive outcome that is relevant to the federal institutions procurement growth.

5.1.2.2. E-Planning E-Procurement module

This module also showed significant procurement cycle time reduction (Z=-12.527, P<0.01) when compared to the manual planning cycle time. The digitalization of the manual procurement cycle from need collection at departments to consolidation and publication of the federal

institutions procurement needs plan has minimized the delays of the traditional planning process. Public procuring entities use of E-Procurement implementation is described to have shorter lead time, reduced cost and efficient procurement cycle. (Nikolaos A. Panayiotou, 2004) E-Procurement reduces the cycle time by digitalizing the planning workflow stages. The E-Planning module makes it easier to prepare and publish procurement plans on the eGp portal. Its functionalities include different plan initiation types, budget alignment with each procurement category (goods, work, service), automatic consolidation of collected similar items and readily available grouped lots that used as inputs for E-Tendering and E-Purchasing. (The Office of Procurement Regulation, 2023). In general, the E-Planning module is the base of most procurement and its functions lead to shorter procurement cycles.

5.1.2.3. E-Purchasing E-Procurement module

The E-Purchasing module result shows lower score ($Z=-9.672$, $p<0.001$) on the comparative analysis of E-Procurement with the previous procurement cycle and on the descriptive statistics measure a neutral to agree response (mean=3.34) on optimization procurement cycle time, which implies existence of underlying limitations and it is not functioning at the required level. The E-Purchasing module processes high volume, low value (Asian Development Bank (ADB), 2013) and emergent, priority procurements. However, E-Purchasing limitations could be linked to the main challenges on E-Procurement from the respondents, such as shifting market prices, system issues, supplier delivery refusal and incomplete documentation. The complex challenges and the cost of managing them becomes demanding and increases the procurement cycle time. The study (Agbeka, Quagrainie, & Kabalan, 2024) notes high level of procurement practices lowers the efficiency, performance and speed of the procurement cycle. Therefore, E-Purchasing module automating urgent procurements (Ministry of Finance, 2025) while challenged by different problems can shadow the positive effect of E-Purchasing in reducing procurement cycle time.

5.1.3. The Transition Challenges

The survey respondents listed several limitations that need more attention. These factors are categorized into Technical & Infrastructural Limitations, Supplier related challenges, Administrative & Regulatory challenges and Price Fluctuations.

In (Kassahun D. , 2024) study on nine selected Ethiopian federal institution, It indicates that ICT infrastructures adequacy and consistency problems as a primary challenge in eGp system implementation. He also includes technical support shortage when encountering system glitches as an additional factor. While (Smadi & Ababneh, 2018) study result showed IT infrastructure readiness is statistically significant predictor of eGp adoption. This also discussed by (Teklu, 2020) , who found Infrastructure limitations and lack of competent technical support limit E-Procurement adoption.

Supplier accountability and engagement challenges were identified as persistent unresolved challenges when transitioning from manual to digital procurement on the literature Procurement reform lesson from five African countries by (Edwin Muhumuza, 2022) which is similar to the survey responses. Communication and digital literacy gaps with suppliers weaken eGp system effectiveness as demonstrated by (Kassahun D. , 2024) and (Asian Development Bank (ADB), 2013) respectively.

The Administrative and Regulatory challenges the respondents mentioned stems from the new E-Procurement directive no. 1073/2025 (Ministry of Finance, 2025) that stated a mandate to include market price verification in the procurement process. (Kassahun D. , 2024), suggests digital procurement is affected by the gaps between the regulations and the E-Procurement modules design. Additionally (EOXS, n.d.), identifies price shift and fluctuations as external factors that affect procurement cycle time similar to the challenges presented on the responses

5.2. Conclusion

The Findings of this study confirm that the implementation of the Electronic Government System (eGp) has significantly reduced procurement cycle time and and explains 61.4% of its variance. Among the system modules, E-Tendering showed more positive impact on procurement cycle time reduction mainly because it has transformed the bidding processes such as bid publication, evaluation and awarding phases. Following E-Tendering, E-Planning automation of the process from need collection to publication also demonstrated considerable improvement of the procurement cycle time. On the other hand, E-Purchasing displayed a lower score on both the Likert scale and Wilcoxon signed rank test, which indicates there is an underlying limitation in the E-Purchasing module that needs attention and could be improved.

Generally, the procurement cycle time reduction comparative analysis of the transition from manual to digital procurement indicated a significant reduction in cycle time on the Wilcoxon signed rank test result of the three core modules. The digitalization of the procurement modules workflow, approvals and processes has produced more efficient procurement cycles and improved the delays caused by manual and paper based procedures.

Furthermore, Staff competency also contributed to the reduction in cycle time by partially mediating between the variables. Additionally, The indirect effect (B=0.3129) is greater than the direct effect (B=0.1988), which proves the eGp system module utilization effect is enhanced with competent staff that can navigate and utilize its features. It also indicates without proficient human resources the eGp system cannot achieve its implementation goals.

System challenges negatively set a boundary condition while moderating between module utilization and procurement cycle time reduction. However, the positive coefficient of module utilization in the moderation table indicates the negative effects of the system issues can be minimized through continuous use of the E-Procurement modules. Active module utilization familiarizes the system users to common system issues and allows them to better handle the system challenges.

The findings also demonstrated bottlenecks that affect effective E-Procurement module utilization. These include technical & infrastructural limitations, supplier related challenges, administrative & regulatory challenges and price fluctuations. These eGp system challenges were identified as factors that delay the procurement cycle time.

Overall, the eGp system has provided a more streamlined procurement cycle with the digitalization of workflows, approvals and automated procedures. However, this 'Digital Edge' can be more strengthened by addressing the system limitations. It is also necessary to combine both competent staff and reliable system alongside the E-Procurement modules i.e., E-Planning, E-Tendering and E-Purchasing to reduce procurement cycle time. While, the eGp system streamlines the procurement cycle, the results demonstrate its effect is enhanced through providing a robust system, developing eGp users' competency and consistent module utilization especially the E-Purchasing module. These improvements will facilitate the procurement cycle,

minimize transactional cost, reduce delays and save unnecessary budget expenditure in the federal institutions.

5.3. Recommendations

Based on the findings, these recommendations serve as a stepping stone to achieve E-Procurement success and faster procurement cycles in the procuring entities.

Invest in Staff Competency and Capacity Building Programs

The analysis results indicated the important role of staff competency in reducing the procurement cycle time even more than the E-Procurement module utilization variable. The Institutions and the Federal Public Procurement and Property Authority should prepare more eGp system focused and system issue troubleshooting training and skill development programs. This will greatly reduce the negative impact of system challenges, produce competent staff that can identify the cause of the system issues and effectively utilize the system modules.

Establish effective system troubleshooting path

To address the system challenges that act as boundary conditions in reducing cycle time, collaboration effort is needed between the institutions, system administrators and the Federal Public Procurement and Property Authority. If there is smooth communication between these three parties, then the system issues can be easily identified and resolved. Additionally, encouragement of more module utilization is also confirmed by the findings to deal with the system challenges.

Strengthen the System Infrastructure and Reliability

The system reliability result in improving the procurement cycle had lower agreement. The issues of the system such as, server downtime, speed and connectivity block the flow of the procurement cycle and reduce the system performance. Therefore, the system infrastructure should be strengthened to fix the system challenges.

Improve Technical Support

A robust technical support service should be set for the eGp system. These services include easily accessible support teams that resolve technical problems. Solving the technical issues allows the eGp users to work past system bugs and errors.

Address the E-Purchasing Module Bottleneck

The E-Purchasing module is very important for high volume and low value procurements, emergency and priority procurements. However, The E-purchasing module demonstrates lower improvement of procurement cycle time compared to other modules. More research and assessment is required to identify the limitation of the E-Purchasing module.

Set up Key Performance Indicators (KPI) System feedback report

There should also be a standardized Key Performance Indicators (KPI) for the eGp system. This allows the institutions to track the system performance. Continuous feedback from the federal institutions users will help assess procurement cycle time and identify its bottlenecks. This is also supported by regular assessments of the progress of the E-Procurement system.

Align policy to resolve the major problems

The policies and regulations around E-Procurement should be drafted regarding the competency of the staff operating daily procurements, system issues resolving procedures and craft policies that align to each of the three specific modules. Additionally, investigate more into the E-Purchasing and other modules limitations. The limitations may include the challenges on the open ended responses such as supplier delivery problems, Price volatility and shifting markets. After the limitations are identified, policies should be revised to address the limitations and align with the system modules.

Recommendations for Future Research

Future studies are recommended to focus on the following:

- Examine the reason behind the difference in opinions and experience of some reporting streamlined procurement while others report challenges related to the system.
- Narrow this study scope to the specific modules and do more research to get a deeper understanding of the factors that hinder the modules efficiency.

- In depth research on the public budget expenditure of the procurement before and after eGp implementation.
- The supplier side of the system and how it affects the procurement cycle.

5.4. Implications

The study's findings have practical, theoretical, research, policy and institutional implications.

Practical Implications

- ✓ The findings show the crucial role of staff competency on reducing the procurement cycle time. This has implications on the federal institution prioritized investment focus. It implies EGP improvement goals and investments directly depend on Staff Capacity building programs to be successful.
- ✓ The negative moderating effect of the system challenges indicates the high gravity of these issues in hindering the eGp system modules performance. This has significant implications for the system developers and administrators. It means working to improve the system is counterproductive without addressing the system challenges.
- ✓ The E-purchasing module has a lower impact on the procurement cycle time compared to the other modules. This is a system gap that can delay high volume low value transactions that the system administrators should focus on.
- ✓ The moderation analysis results have showed increasing module utilization minimizes the effect of system challenges that act as boundary conditions. This implies in addition to trainings, continuous system engagement is mandatory for reduced procurement cycles.

Policy and Institutional Implications

- ✓ The findings indicate the importance of the alignment of the policies with the system modules and cross check of the directives with specific E-Procurement steps. It implies removing or revising the regulations that hinder the procurement workflow of the institutions. These unchecked policies may continue to hinder the procurement cycle if left unchecked.
- ✓ The public procurement and property authority needs to execute strict actions on difficult suppliers and establish Supplier focused technical support, regular training programs,

supplier tracking and control regulation systems. Since the supplier number is actively growing, more trainings and dedicated technical support have direct implication to improve supplier participation in the procurement cycle. In addition, locating suppliers' address is important to avoid delivery refusal and sample submission delays that determine procurement cycle outcomes.

Theoretical Implications

- ✓ Confirm the Resource Based View (RBV) framework – The findings confirm the RBV theory by showing that the E-Procurement system alone cannot reduce procurement cycle time without human resources competency. (Wernerfelt, 1984) It also aligns with Resource Based View of utilizing internal resource capabilities to improve performance.
- ✓ Confirm Transaction Cost Economics (TCE) framework – The effect of E-Procurement module utilization reduce the cost of procurement cycle time and provide performance advantages. Additionally, labor, time and financial costs are minimized as a result of the eGp system implementation. However, the system also has technical and infrastructural issues that lower the cost saving effect of the eGp system if they are not addressed. This confirms the TCE theory of establishing the right procedures to lower costly transactions. (Williamson, 1985)

Research Implications

- ✓ The findings of the study have uncovered the positive effects of E-Procurement as well as its bottlenecks. This indicates future studies should move forward in the research of eGp post implementation stage various aspects to identify system module bottleneck especially the E-Purchasing module
- ✓ After this paper, future research can continue this study focusing on the specific modules individually and analyzing the deeper impact of the modules.

REFERENCES

Adebayo, O. T. (2025). Technology Adoption and Organizational Change. *International Journal of Advances in Engineering and Management (IJAEM), 7*(1), 68-79.

Agbeka, E. K., Quagrainie, F. A., & Kabalan, A. A. (2024). Procurement practices and operational performance: a study of linear and curvilinear relationships in a developing economy Available to Purchase. *Journal of Public Procurement, 24*(3), 320-347.

Amarapathy, P., Jayasena, H. S., & Ranadewa, K. A. (2013). E-TENDERING FRAMEWORK FOR PUBLIC PROCUREMENT IN SRI LANKA. *The Second World Construction Symposium 2013 : Socio-Economic Sustainability in Construction* (pp. 218-225). Colombo: University of Moratuwa.

Apleni, A., & Smuts, H. (2020). An e-Government Implementation Framework: A Developing Country Case Study. In *Responsible Design, Implementation and Use of Information and Communication Technology* (Vol. 12067, pp. 15-26). Springer Nature.

Arthur D. Little. (2009). *Procurement Performance Measurement : What CFOs expect from measuring Procurement Success.* Arthur D. Little.

Asante, C. R. (2013). The Impact of Technology in Organizations: An Empirical Review. *International Journal of ICT and Management, 1*(3).

Asgharia, M., Rostambeygi, F., Hosseini, S. H., & Motamedib, M. (2022). Approach, An Analysis of Influential Factors on Procurement Cycle Time Using a System Dynamics. *Journal of Systems Thinking in Practice, 1*(3), 75-91.

Asian Development Bank (ADB). (2013). *e-Government Procurement Handbook.* Asian Development Bank.

Audit Scotland; NHS Scotland. (2001). *Procurement performance measurement framework.* Audit Scotland.

Burtscher, M., Piano, S., & Welby, B. (2024). Developing skills for digital government: A review of good practices across OECD governments.

Cabrera-Moya, D. R., & Reyes, G. E. (2018). Resource-Based View (RBV) review, conceptual model and application methodology for the Integrated Public Transport System (IPTS) of Bogotá-Colombia. *Revista ESPACIOS, 39*(22), 25.

Cook, B. (2025, April 29). *What is E-Tendering?* Retrieved December 2025, from Tipalti: https://tipalti.com/resources/learn/e-tendering/

Edwin Muhumuza, L. M. (2022). *Fulfilling the promise of procurement reform : LESSONS FROM 5 AFRICAN COUNTRIES.* Open Contracting Partnership 2022.

Elias, E. M., Mahidin, N., & Shiratuddin, N. (2003). E-Tendering System for Construction Projects. *Faculty of Information Technology, Universiti Utara Malaysia.* Sintok.

Elliott, A. C., & Woodward, W. A. (2016). *IBM SPSS by Example: A Practical Guide to Statistical Data Analysis (2nd ed.).* Thousand Oaks, California: SAGE Publications, Inc.

Endale, A. (2025, March 15). *Federal institutions spend 342 billion birr in first half-year*. Retrieved from The Reporter Ethiopia: https://www.thereporterethiopia.com/44186/

EOXS. (n.d.). *Impact on procurement cycle times.* Retrieved December 2025, from EOXS: https://eoxs.com/new_blog/impact-on-procurement-cycle-times/

Federal Democratic Republic of Ethiopia. (2024). Federal Public Procurement and Property Administration Proclamation No. 1333/2024. Addis Ababa: Federal Negarit Gazette.

Federal Public Procurement and Property Administration Agency. (n.d). *The eGP platform*. Retrieved from Electronic Government Procurement (eGP) System: https://production.egp.gov.et/egp/home

Field, A. (2018). *Discovering Statistics Using IBM SPSS Statistics (5th ed.).* Los Angeles, London, New Delhi, Singapore, Washington DC, Melbourne: SAGE Publications.

Garner, J. (2014). *Tendering Strategies.* London: Royal Institution of Chartered Surveyors (RICS).

Garth, A. (2008). Analysing data using SPSS (A practical guide for those unfortunate enough to have to actually do it.). Sheffield Hallam University.

Golson, J. P. (1977). The impact of technological change on organization management. 293-299.

Kassahun, D. (2024). *FACTORS AFFECTING THE EFFECTIVE IMPLEMENTATION OF ELECTRONIC GOVERNMENT PROCUREMENT IN ETHIOPIA: IN THE CASE OF NINE SELECTED FEDERAL BUDGETARY ORGANIZATIONS.* Addis Ababa: Ethiopian Civil Service University.

Kassahun, M. (2021). *ASSESSMENT OF PROJECT PROCUREMENT PRACTICES IN PUBLIC INSTITUTION; CASE OF ENGINEERING DEPARTMENT AT AAIT, AAU.* Addis Ababa: St. Mary's University.

Mailani, D., Hulu, M. Z., Simamora, M. R., & Kesuma, S. A. (2024). Resource-Based View Theory to Achieve a Sustainable Competitive Advantage of the Firm: Systematic Literature Review. *International Journal of Entrepreneurship and Sustainability Studies (IJEASS), 4*(1).

Mastor, S. H., & Azizan, A. Z. (n.d.). E-TENDER APPLICATION AND ITS IMPLICATION TO MALAYSIAN ONSTRUCTION INDUSTRY.

Mekonnen, A. (2022). *FACTORS INFLUENCING PROCUREMENT PERFORMANCE IN PUBLIC GOVERNMENTAL ORGANIZATIONS IN DIRE DAWA.* Dire Dawa: Dire Dawa University.

Menile, S. (2024). *HE EFFECT OF ELECTRONIC GOVERNMENT PROCUREMENT ON USERS SATISFACTION IN SELECTED SECTOR OFFICES OF THE FEDERAL GOVERNMENT OF ETHIOPIA.* Addis Ababa: St. Mary's University.

Ministry of Finance. (2021). *The Federal Electronic Government Procurement and Sale of Disposable Property Directive (Directive No. 814/2021).* Addis Ababa: Ministry of Finance.

Ministry of Finance. (2025). *Federal Public Procurement Directive No. 1073/2025.* Addis Ababa, Ethiopia: Ministry of Finance, Federal Democratic Republic of Ethiopia.

Ministry of Innovation and Technology . (2025). *Digital Ethiopia 2030 : Ethiopia's Digital Transformation Strategy.* Addis Ababa: Ministry of Innovation and Technology (MInT); Federal Democratic Republic of Ethiopia.

Mohungoo, I., Brown, I., & Kabanda, S. (2020). A Systematic Review of Implementation Challenges in Public E-Procurement (IFIP Conference on e-Business, e-Services and e-Society). In M. H. al. (Ed.), *I3E 2020 (IFIP Conference on e-Business, e-Services and e-Society). 12067*, pp. 46-58. Springer Nature Switzerland AG.

Nikolaos A. Panayiotou, S. P. (2004). An e-procurement system for governmental purchasing. *International Journal of Production Economics, 90*(1).

OECD. (2023). *Public procurement performance: A framework for measuring efficiency, compliance and strategic goals.* OECD Publishing.

ProQsmart. (2024, April). *Procurement Cycle: A Comprehensive Guide in 2025.* Retrieved from ProQsmart Blog.

Royal Institution of Chartered Surveyors . (2015). Tendering strategies.

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research Methods for Business Students* (9th ed.). Pearson Education.

Shakya, R. K. (2018). *E-Government Procurement (e-Procurement) Strategy of Ethiopia and Action Plan, 2018.* Addis Ababa: Federal Public Procurement & Property Administration Agency.

Smadi, Z. M., & Ababneh, H. T. (2018). Toward Realizing Operational Excellence through e-Procurement Adoption: A Resource based view. *Global Journal of Management and Business Research: A Administration and Management, 18*(13), 1*10.

Society of Chartered Surveyors Ireland (SCSI) and RICS. (2014). *eTendering.* Dublin: Society of Chartered Surveyors Ireland (SCSI) and the Royal Institution of Chartered Surveyors (RICS).

Society of Chartered Surveyors Ireland and RICS. (2014). *eTendering : SCSI / RICS Guidance Note.* Society of Chartered Surveyors Ireland.

Tafesse, B. (2023, April 29). *Digital Procurement System Faces Drawbacks*. Retrieved from Addis Fortune: https://addisfortune.news/digital-procurement-system-faces-drawbacks

Tefera, T. (2023). *ETHIOPIA E-PROCUREMENT PLATFORM PROVIDES EASY ACCESS TO PUBLI TENDERS.* trade.org.

Teklu, D. (2020). *FACTORS AFFECTING THE ADOPTION OF E-PROCUREMENT IN PUBLIC ORGANIZATIONS: THE CASE OF ADDIS ABABA CITY ROADS AUTHORITY.* Addis Ababa: St. Mary's University.

The Office of Procurement Regulation. (2023). *General Guidelines – Electronic Procurement.* The Office of Procurement Regulation.

The World Bank. (2021). *Assessment of the Public Procurement System : Methodology for Assesing Procurement Systems.* The World Bank.

UNCTAD. (2025). *Technology and Innovation Report : Inclusive Artificial Intelligence for Development.* United Nations.

Wako, A. D., Oteki, E. B., & Abillah, I. O. (2024). Electronic Ordering and its Effect on Tendering Process Efficiency in Public Universities in Kenya. *East African Journal of Business and Economics, 7*(1), 341-355.

Wernerfelt, B. (1984). A Resource-based View of the Firm. *Strategic Management Journal, 5*(2), 171-180.

Williamson, O. E. (1985). *The Economic Institutions of Capitalism : Firms, Markets, Relational Contracting.* The Free Press.

World Bank. (2007). *Electronic Government Procurement : Definition, Implementation and Roadmap.* World Bank.

World Bank Group. (2019). *Federal Democratic Republic of Ethiopia : Public Expenditure and Financial Accountability Performance Assessment Report.* The World Bank.

WorldBank.org. (2007). *Electronic Government Procurement.* WorldBank.org.

APPENDIX

Research Questionnaire

The Digital Edge: Analyzing the Effect of E-Procurement on Procurement Cycle Time in Selected Ethiopian Federal Institutions

Welcome! This research examines how the transition from manual procurement to the Electronic Government Procurement (eGp) system has affected procurement cycle efficiency in Ethiopian federal institutions. Your practical experience is vital to identifying time savings and system bottlenecks.

Note: Participation is voluntary. All responses are confidential and used strictly for academic purposes.

Demographic & Role Information (tick or fill)

Instruction: Please tick / fill your professional background information to help us categorize the data

1. **Current position / role** (tick one)**:**
   ☐ Procurement officer ☐ Procurement unit head ☐ Technical Expert ☐ Endorsing committee member ☐ Other: _____
2. **Years of experience in procurement** (tick one):
   ☐Less than 2 years; ☐ 2–5 years; ☐ 6–10 years; ☐ 11–15 years; ☐Over 15 years
3. **Highest education level** (tick one): ☐ Diploma ☐ Bachelor ☐ Master ☐ PhD ☐ Other: _____

Part A: eGp System Usage & Challenges

Instruction: Please tick /select the options that best reflect your professional experience with the eGp platform.

1. **How long have you been actively using the eGp system professionally?**
   ☐ <1 year | ☐ 1-2 years | ☐ 3-4 years | ☐ > 4 years
2. **How often do you use the eGp system?**
   ☐ Daily ☐ Sometimes ☐ Never
3. **Estimate the percentage of time saved by eGp compared with the manual system? (average saved time):**
   ☐ Less than 25% | ☐ 25–50% | ☐ 51–75% | ☐ More than 75%

PART B: Procurement Cycle Time Assessment (Before vs. After)

Instruction: For each procurement type, enter the average estimate number of days before eGp (manual era) and after eGp (use system timestamps if available).

Procurement type	**Average cycle time before eGp (in days)** (Manual era)	**Average cycle time under eGp (in days)** (EGP timestamps)
1. Annual Planning	_____(days)	_____(days)
2. Tendering	_____(days)	_____(days)
3. Purchasing (Pro forma)	_____(days)	_____(days)

Part C: Perception & Agreement

Instruction: Please rate each statement from 1 (Strongly Disagree) to 5 (Strongly Agree):

(1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)

Section & Variable	Statement	1	2	3	4	5
1. Impact on PCT	Since adopting the eGp system, our institution has seen a significant reduction in overall procurement cycle time, specifically from the initial need identification through to the final contract award.	☐	☐	☐	☐	☐
	Automated workflows have decreased the duration of the internal approval process compared to manual paperwork.	☐	☐	☐	☐	☐
	The e-procurement system has streamlined evaluation and documentation processes, leading to faster procurement cycles.	☐	☐	☐	☐	☐
	Digitalization has reduced the paper-heavy administrative workload delays found in traditional procurement cycle.	☐	☐	☐	☐	☐
2. Module Utilization	The end-to-end integration of eGp modules ensures a seamless digital workflow, eliminating information bottlenecks throughout the entire procurement lifecycle.	☐	☐	☐	☐	☐
	The digitalization of bid solicitation and evaluation through the E-Tendering module results in a faster, more agile tendering cycle compared to traditional paper-based methods.	☐	☐	☐	☐	☐

Section & Variable	Statement	1	2	3	4	5
	The E-Planning module automates the consolidation and publication of departmental needs, significantly reducing the duration of the planning and approval stage.	☐	☐	☐	☐	☐
	The e-purchasing module optimizes transactional speed and facilitates the issuance of high-volume, low-value purchase orders.	☐	☐	☐	☐	☐
3. Staff Competency	Procurement staffs in my institution have the necessary technical proficiency to navigate eGp modules without external assistance.	☐	☐	☐	☐	☐
	I have received adequate training to use the eGp system confidently, which contributes to shorter processing times for procurement requests.	☐	☐	☐	☐	☐
	The technical language or terminologies within the eGp system interface are clear and easy to understand, reducing the time required to complete bidding documents.	☐	☐	☐	☐	☐
	Staffs in my institution demonstrate a high level of digital literacy, allowing them to troubleshoot technical errors and complete digital procurement tasks without frequent mistakes.	☐	☐	☐	☐	☐
4. Challenges	The e-GP system consistently performs reliably, with minimal downtime or server speed issues, supporting timely procurement activities.	☐	☐	☐	☐	☐
	The eGp system maintains a stable connection without unexpected session timeouts, bugs or technical glitches during critical procurement transactions.	☐	☐	☐	☐	☐

Part D: Open-Ended Questions (Qualitative Insights)

Instruction: Please provide brief, descriptive answers to help us understand the "why" behind the answer.

1. **Top Factors/ Challenges:** Please list the 3 most significant systemic, technical, or procedural bottlenecks (e.g., connectivity, system bugs, supplier issues, approval delays, resistance, training, legal policy, etc.). Briefly describe how these specifically impact the Procurement Cycle Time in your institution when using the eGp system.