

**HUMAN RESOURCE TRAINING DETERMINANTS AND THEIR MODERATING
CONTEXTUAL FACTORS IN THE IMPLEMENTATION OF E-GOVERNMENT
SERVICES: EVIDENCE FROM HUDUMA CENTRES IN KENYA**

JOSEPH MUIA KALELI

**A Thesis Submitted in Partial Fulfillment of the Requirements for the Award of the
Degree of Doctor of Philosophy in Business Administration (Human Resource
Management) of Kenya Methodist University**

OCTOBER, 2025

DECLARATION

This thesis is my original work and has not been presented for a degree or any other award in any other University.

Signed:

Date:

Joseph Muia Kaleli

BUS-4-0460-1/2020

We confirm that the work reported in this thesis was carried out by the candidate under our supervision.

Signed:

Date:

Dr. Susan Nzioki, PhD

School of Business and Economics

Kenya Methodist university

Signed:

Date:

Dr. Vivian Cherono , PhD

School of Business and Economics

Kenya Methodist University

DEDICATION

To my family for your unconditional love, financial support, unequalled input in the entire academic ventures, as well as constant challenge and encouragement towards this endeavor.

ACKNOWLEDGMENT

Praise and gratitude be to Almighty God, who bestowed upon me good health and resources that enabled the successful completion of this research thesis. I extend my heartfelt appreciation to my dedicated supervisors, Dr. Susan Nzioki and Dr. Vivian Cherono, PhD, for their unwavering guidance throughout the process. Special thanks to the Kenya Methodist University fraternity for granting me the opportunity to acquire knowledge, with a well-equipped library, exceptional lecturers in the business department, and a supportive staff. I am sincerely grateful to Josephine Kitungi for proofreading this proposal and providing unwavering encouragement. My thanks also go to my friend, Emmanuel Kasyoka, and my sister, Dorcus Musyimi, for their financial, prayerful, and moral support. To everyone who made a significant contribution to this research thesis, may God bless you abundantly.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGMENT	iv
LIST OF TABLES	vii
LIST OF FIGURES	viii
ABSTRACT.....	viii
CHAPTER ONE	1
INTRODUCTION	1
1.1Background of the Study.....	1
1.2 Statement of the Problem	5
1.3 Research Objectives	7
1.4 Research Hypothesis	8
1.5 Research Justification	8
1.6 Significance of the Study	10
1.7 Scope of the Study	17
1.8 Limitation of the Study	17
1.9 Operational Definition of Terms.....	19
CHAPTER TWO	20
LITERATURE REVIEW	20
2.1 Introduction.....	20
2.2 Theoretical Review	20
2.3 Empirical literature review.....	25
2.4 Conceptual Framework	60
2.5 Operational Framework	62
CHAPTER THREE	69
RESEARCH METHODOLOGY	69
3.1 Introduction.....	69
3.2 Research Philosophy	69
3.3 Target Population.....	70

3.5 Sampling frame	72
3.6 Sampling Technique and Sample Size	73
3.7 Data Collection Procedures.....	75
3.8 Pilot Study.....	76
3.9 Data Analysis and Results Presentation.....	79
3.10 Diagnostic Tests.....	83
3.11 Ethical Considerations	87
CHAPTER FOUR	88
RESULTS AND DISCUSSION	88
4.1 Introduction.....	88
4.2 Response Rate	88
4.3 Pilot Test Results	90
4.4 Respondents background of the information	93
4.5 Diagnostic Tests of Variables	98
4.6 Descriptive Analysis of the Study Variables	107
4.7 Bivariate Linear Correlation Analysis- All Variables.....	178
4.8 Multiple Linear Regression Analysis -All Variables.....	193
CHAPTER FIVE	210
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	210
5.1 Introduction.....	210
5.2 Summary of the findings.....	210
5.2.1 Influence of Training Methods on Electronic government Service Implementation	210
5.2.2 Influence of training frequency on electronic government service implementation	211
5.2.3 Influence of continuous professional development (CPD) on electronic government Service implementation.....	211
5.2.4 Influence of technological infrastructure on electronic government Service implementation.....	212
5.2.5 Moderating Influence of Organizational Culture	213

5.2.6 Combined influence of Human Resource Training on Electronic government Services implementation	214
5.3 Conclusion	214
5.4 Recommendations	216
5.4.1 Policy recommendations	216
5.4.2 Management recommendations.....	217
5.4.3 Technological recommendations.....	217
5.5 Areas for further research	218
REFERENCES	220
APPENDICES.....	236
Appendix I: Application for Research Letter.....	236
Appendix II: Research Questionnaire for Managers.....	237
Appendix III: Authorization Letter	244
Appendix IV: Research Permit	247

LIST OF TABLES

Table 3. 1: Target Population	72
Table 3. 2: Sample Size	75
Table 4. 1: Response Rate	89
Table 4. 2: Reliability Results	90
Table 4. 3: Pilot Test Cronbach's Alpha reliability Statistics	92
Table 4. 4: Kaiser-Meyer-Olkin and Bartlett's Test.....	92
Table 4. 5: Age bracket.....	94
Table 4. 6: Gender category.....	95
Table 4. 7: Educational qualification.....	96
Table 4. 8: Years of experience	97
Table 4. 9: Kolmogorov-Smirnov test	99
Table 4. 10: Autocorrelation test	101
Table 4. 11: Collineality Test- Multicollineality	102
Table 4. 12: Linearity Tests Results	103
Table 4. 13: KMO and Bartlett's Test for influence of training method (TM)	108
Table 4. 14: Factor Analysis for Training Method	110
Table 4. 15: Descriptive results for influence of training methods	113
Table 4. 16: KMO and Bartlett's Test for Training Frequency Factors	125
Table 4. 17: Factor analysis for training frequency	127
Table 4. 18: Descriptive Analysis for training frequency.....	128
Table 4. 19: KMO and Bartlett's Test for continuous professional development factors ...	136
Table 4. 20: Descriptive Analysis for Continuous Professional Development	137
Table 4. 21: KMO and Bartlett's test for technological infrastructure.....	145
Table 4. 22: Factor analysis for technological infrastructure	146
Table 4. 23: Descriptive Results for Technological Infrastructure Maintainance	147
Table 4. 24: KMO and Bartlett's Test for Organizational Culture factors	156
Table 4. 25: Factor analysis for organizational culture (OC)	157
Table 4. 26: Descriptive results for mediating role of organizational culture	158

Table 4. 27: KMO and Bartlett’s test for implementation of electronic government Service Factors	167
Table 4. 28: Factor analysis for implementation of electronic government Service (IeGs)	168
Table 4. 29: Descriptive results for implementation of electronic government service delivery	169
Table 4. 30: Bivariate Linear Correlation Analysis -All Variables	179
Table 4. 31: Human Resource Training Method -Bivariate regression.....	183
Table 4. 32: Human Resource Training Frequency-Bivariate regression	185
Table 4. 33:Continuous Professional Development -Bivariate Regression.....	188
Table 4. 34: Technology Infrastructure -Bivariate regression.....	190
Table 4. 35: Model Validity.....	194
Table 4. 36:Multiple Linear Regression - Model Summary.....	195
Table 4. 37: Multiple Regression Analysis – Regression Weights	196
Table 4. 38: Modified Multiple Regression - Model Validity.....	201
Table 4. 39: Moderated Multiple Regression-Model Summary.....	202
Table 4. 40: Moderated Multiple Regression -Weights.....	204
Table 4. 41:Test of moderation influence of organizational culture	207
Table 4. 42: Summary of Hypotheses Tested.....	209

LIST OF FIGURES

Figure 2. 2: Conceptual framework	61
Figure 2. 3: Operational Framework	62
Figure 4. 1: Normality test results	100
Figure 4. 2: Test for Homoskedasticity.....	105
Figure 4. 3: Scatterplot Predicted Linear Line.....	106
Figure 4. 4: Test of moderation – path diagram for direct and indirect effects.....	199

ABSTRACT

The study examined the influence of human resource training determinants on the implementation of electronic government service delivery in Huduma Centres in Kenya. Despite notable investment in digital platforms and infrastructure, inconsistencies in service quality, digital proficiency, and citizen satisfaction remained evident across Huduma Centres, signaling that training interventions and organizational factors were not yielding uniform results. Although targeted training initiatives had improved staff proficiency and operational efficiency, the absence of systematic evaluation of specific training determinants and the moderating influence of organizational culture had limited the realization of Kenya's e-government objectives. The purpose of the study was therefore to establish the influence of training methods, training frequency, continuous professional development, and technological infrastructure on the implementation of electronic government service delivery in Huduma Centres, and to assess the moderating effect of organizational culture. The study was guided by the Human Capital Theory, Experiential Learning Theory, Diffusion of Innovation Theory, and Organizational Culture Theory. It adopted a cross-sectional research design and targeted a population of 1,560 Huduma Centre employees across 52 centres nationwide. A stratified random sampling technique was used to ensure representativeness across job categories, and the sample was determined scientifically using proportionate allocation. The final sample size comprised 156 respondents, including 52 managers, 52 ICT officers, and 52 customer service representatives. Data were collected using structured questionnaires containing both closed and open-ended items. Quantitative data were analyzed using descriptive, correlation, and regression analysis, while qualitative data were analyzed thematically and integrated to enrich interpretation. The descriptive results indicated that interactive and practical training methods improved employee competence and efficiency; that regular and structured training frequency sustained staff adaptability; that continuous professional development enhanced digital literacy and innovation; and that the availability of adequate technological infrastructure significantly facilitated e-government service delivery. Correlation analysis revealed positive and significant associations between each training determinant and service delivery, while regression results confirmed that all determinants contributed meaningfully to variations in e-government implementation, with organizational culture partially moderating these relationships. The study recommended that government agencies adopt simulation-based and blended learning methods to enhance staff performance, institutionalize monthly training schedules, promote continuous professional development through certification programs, and strengthen technological infrastructure to support digital operations. It further recommended fostering an innovation-driven organizational culture to sustain the successful implementation of electronic government services in Kenya's Huduma Centres.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The introduction of electronic government service delivery refers to the use of digital systems to provide public services in a way that enhances accessibility, efficiency, and transparency. It involves applying information and communication technologies (ICTs) to improve interactions between governments, citizens, businesses, and other institutions (Nnenna, 2024). This concept extends beyond simply establishing online portals it emphasizes their effective use to deliver timely, reliable, and user-friendly services (Al-Shboul et al., 2021). Research shows that the success of e-government initiatives depends largely on the competence and preparedness of personnel managing digital systems (Heeks & Santos, 2009). Continuous skill development enables staff to transform digital infrastructure into tangible service outcomes, making human resource training a cornerstone of successful e-government operations.

The development of e-government has evolved alongside technological innovation and the growing demand for efficiency in public administration. From basic web presence in the 1990s to modern integrated digital platforms, governments have shifted toward citizen-centered systems emphasizing inclusivity and accountability (Bencsik et al., 2024). Global trends highlight investments in digital identity, data integration, and user feedback mechanisms to enhance service quality. However, studies suggest that technological progress alone is insufficient continuous staff training remains critical to effective implementation (Macharia, 2024). Therefore, human resource capacity building is fundamental to sustaining digital reforms and achieving improved service outcomes.

The connection between human resource training and e-government implementation is underpinned by several theoretical perspectives, including Human Capital Theory, Experiential Learning Theory, and Diffusion of Innovation Theory. Human Capital Theory asserts that investing in employee development increases productivity and service performance (Becker, as cited in Heeks & Santos, 2009). Experiential Learning Theory emphasizes how employees gain digital competence through practical engagement and reflection (Muthoni & Waweru, 2020). Meanwhile, the Diffusion of Innovation Theory highlights the significance of leadership and organizational culture in promoting technology adoption (Wang et al., 2022). When aligned strategically, these frameworks foster innovation, adaptability, and improved service delivery. Accordingly, this study integrates these theories to explain how training factors shape e-government performance.

Globally, nations such as the United States, Canada, China, and Australia demonstrate that training is vital to the success of electronic governance. In the United States, structured programs have raised digital literacy among public servants by 30%, improving efficiency and satisfaction (Lee-Geiller, 2024; Díaz-Arancibia et al., 2024). Canada recorded a 25% increase in staff competency and a 20% boost in transaction speed after implementing systematic training initiatives (Hadziristic, 2017). In China, focused training enhanced digital skills by 35%, leading to faster, more dependable services (Qin et al., 2024). Likewise, Australia's emphasis on continuous professional development has significantly strengthened responsiveness and citizen satisfaction (Mukan & Yaremko 2019). Collectively, these examples illustrate that robust training programs are central to successful e-government implementation worldwide.

Within Africa, human resource development is a decisive factor for e-government advancement, though progress varies across countries. In Ghana, the Government through GIMPA has focused on building capacity in digital communication, data analysis, and project management, which has enhanced service efficiency (Bondzi-Simpson & Agomor 2020; Agomor 2024). South Africa's National School of Government has promoted digital competency among public officials (Ngcaweni, 2023). While Egypt's Civil Service Training and Development Centre has improved digital literacy and cybersecurity knowledge (Hassan, 2025). These initiatives underscore the importance of targeted training in ensuring sustainable and effective e-government delivery across the continent.

Despite notable progress, African countries continue to face obstacles such as poor infrastructure, insufficient funding, and limited technical capacity. Although the African Union's digital transformation strategy promotes ICT skill development, many states lack structured frameworks for ongoing professional training (Ayodele, 2025). Consequently, implementation outcomes remain uneven, favoring wealthier nations. Still, countries like Rwanda, Ghana, and South Africa illustrate that effective training and supportive institutional culture can significantly improve performance. Therefore, investing in human resource capacity is essential for achieving lasting digital governance outcomes.

In Kenya, the establishment of Huduma Centres in 2013 marked a major step toward modernizing public services. These one-stop centers integrate various government functions under a single digital system to enhance access and efficiency (Republic of Kenya [RoK], et al., 2023). The Kenya School of Government (KSG) has played a vital role in training staff to operate these digital platforms. Nonetheless, reports highlight ongoing challenges in employee digital proficiency, causing delays and reduced satisfaction (Kiplagat et al., 2022). Although

targeted training has improved competence and efficiency, significant disparities persist across different centers. This calls for deeper analysis of how training strategies and institutional culture affect e-government outcomes.

The Kenyan government's commitment to digitalization is evident in the Huduma Kenya Digitalization Plan which aligns with Vision 2030 and the national e-Government Strategy. However, persistent issues such as inconsistent training, inadequate infrastructure, and organizational barriers continue to hinder progress. The Huduma Kenya Secretariat emphasizes that training should be continuous, inclusive, and technology-driven (Nkanata & Ocholla, 2023). Therefore, this study focuses on how training methods, professional development, and technological capacity jointly influence e-government success. By integrating Kenya's experience with international best practices, the research seeks to provide insights that support effective digital governance and sustainable service delivery.

1.1.1 Huduma Centers in Kenya

The Government of Kenya inaugurated the first Huduma Centre on November 7, 2013, at the General Post Office in Nairobi. This milestone marked the beginning of a transformative approach to public service delivery, designed to consolidate multiple government services within a single, easily accessible location. As part of Kenya's broader e-government strategy, Huduma Centres were established to improve efficiency, accessibility, and citizen satisfaction through the integration of digital systems (Kiplagat et al., 2022). The effectiveness of this initiative, however, relies heavily on the digital competence and readiness of the personnel operating these centers.

To support this goal, the Kenya School of Government (KSG) has played a leading role in training Huduma Centre employees, providing them with essential digital and service management skills. Despite these ongoing capacity-building efforts, notable gaps remain in staff proficiency, prompting the need to evaluate the adequacy and impact of existing training programs. Reports from the Huduma Kenya Secretariat indicate that targeted training interventions have enhanced staff digital proficiency by approximately 25%, leading to a 20% improvement in service efficiency, as demonstrated by shorter transaction processing times (Kenya National Bureau of Statistics [KNBS], 2023). Moreover, citizen satisfaction levels have risen by 15%, underscoring the pivotal role of human resource training in strengthening Kenya's digital public service delivery .

1.2 Statement of the Problem

Although Kenya has made significant strides in e-government reforms, including the creation of Huduma Centres in 2013 to modernize and centralize public service delivery, the rollout of electronic government services continues to face inconsistencies and has yet to meet its full potential. The Huduma Kenya Digitalization Plan of 2023 outlines a vision centered on enhancing service efficiency and citizen satisfaction through the adoption of technology-based systems and improved digital operations. However, government assessments reveal that several centres still experience long queues, service delays, and limited accessibility for citizens in remote regions (KNBS, 2023). Although targeted training interventions have led to a 25% improvement in staff proficiency, a 20% increase in service efficiency, and a 15% rise in citizen satisfaction, significant disparities persist across counties (RoK et al., 2023). These inconsistencies highlight weaknesses in training methods, uneven technological

infrastructure, and organizational cultures that do not fully support continuous learning and digital innovation.

Empirical evidence from recent Kenyan studies confirms these challenges. Kilinda (2023) examined e-readiness factors influencing e-government usage but did not analyze how variations in training methods or frequency affect service delivery outcomes. Likewise, Mutegi et al. (2023) explored work environment factors influencing performance in Huduma Centres but overlooked the role of continuous professional development and technology infrastructure. Further, the Ministry of Public Service (2024) reported that 40% of Huduma staff lack sufficient ICT competencies, indicating a mismatch between existing training interventions and evolving digital demands. Despite ongoing government investment, there remains no comprehensive empirical assessment that links human resource training determinants to the effectiveness of e-government service implementation in Kenya.

Across the world, nations such as the United States, Canada, China, and Australia illustrate that structured training and ongoing professional development play a vital role in improving public service performance and enhancing citizen satisfaction (Chung & Kim, 2020; Wang et al., 2022). However, within the Kenyan context, there remains a lack of empirical research exploring how specific training factors interact with organizational culture to shape the success of electronic government implementation. This gap is both theoretical and practical, as effective digital governance relies not only on advanced technology but also on a skilled workforce and a supportive institutional culture.

Accordingly, this study seeks to address the existing research gap by examining how key determinants of human resource training namely training methods, training frequency, continuous professional development, and technological infrastructure affect the

implementation of e-government services in Huduma Centres. It also investigates the moderating influence of organizational culture on these relationships. By contextualizing global e-government frameworks within Kenya's decentralized public service environment, the study aims to make a meaningful scholarly contribution. The findings are expected to enrich existing theory, inform policy on public sector training, and improve practice by strengthening human resource capacity for efficient, citizen-oriented digital service delivery.

1.3 Research Objectives

1.3.1 General Objective

The general objective of this study was to establish human resource training determinants and their moderating contextual factors in the implementation of e-government services in Huduma Centres in Kenya.

1.3.1 Specific Objectives

- i. To examine the influence of human resource training methods on the implementation of electronic government services in Huduma Centres.
- ii. To evaluate the effect of human resource training frequency on the implementation of electronic government services in Huduma Centres.
- iii. To assess how continuous professional development influences the implementation of electronic government services in Huduma Centres.
- iv. To analyze the impact of technological infrastructure on the implementation of electronic government services in Huduma Centres.
- v. To determine the moderating effect of organizational culture on the relationship between human resource training determinants and the implementation of electronic government services in Huduma Centres.

1.4 Research Hypothesis

- i. **H₀₁:** Human Resource Training Methods do not significantly influence implementation of electronic government service in Huduma Centres
- ii. **H₀₂:** Human Resource Training frequency does not significantly influence implementation of electronic government service in Huduma Centres
- iii. **H₀₃:** Continuous Professional Development does not significantly influence implementation of electronic government service in Huduma Centres
- iv. **H₀₄:** Technological Infrastructure does not significantly influence implementation of electronic government service in Huduma Centres
- v. **H₀₅:** Organizational culture does not significantly moderate the relationship between human resource training determinants and implementation of electronic government service in Huduma Centres in Kenya

1.5 Research Justification

The success of electronic government service delivery depends not only on technological infrastructure but also on the competencies, commitment, and adaptability of the human workforce managing these systems. While prior studies have explored the role of ICT infrastructure and leadership in advancing e-government, limited empirical research has examined how human resource training determinants—specifically training methods, training frequency, continuous professional development, and technological infrastructure—influence service delivery outcomes within developing countries. Moreover, few studies have analyzed the moderating influence of organizational culture on these relationships, leaving a significant theoretical and practical gap (Macharia 2024; Wang et al., 2022). Addressing this gap is vital

for improving public sector readiness and the sustainable implementation of digital service delivery frameworks in Kenya's Huduma Centres.

1.5.1 Theoretical Justification

This study contributes to theory by integrating the Human Capital Theory, Experiential Learning Theory, Diffusion of Innovation Theory, and Organizational Culture Theory to explain the influence of training on electronic government implementation. Previous studies have often applied these theories in isolation, limiting understanding of how human resource training operates within dynamic digital environments (Heeks & Santos, 2009; Muthoni & Waweru, 2020). The study's conceptual model positions human resource training as a mediating mechanism through which learning, innovation, and culture interact to shape service outcomes. By examining the moderating role of organizational culture, the research extends theory by explaining how internal values, beliefs, and norms influence the translation of training into performance. Consequently, this study enriches scholarly discourse on how training determinants interact with institutional and cultural factors to enhance the effectiveness of digital governance.

1.5.2 Policy Justification

From a policy perspective, the findings of this study will offer empirical insights to guide government agencies and policymakers in developing standardized and competency-based training frameworks for public servants. Evidence from this study will inform the Huduma Kenya Secretariat, Public Service Commission, and Kenya School of Government (KSG) on how to structure training programs that align with Kenya's Digital Economy Blueprint and Vision 2030. Policymakers will gain a deeper understanding of which training determinants

most significantly influence e-government outcomes, enabling more efficient resource allocation and improved accountability. Additionally, the study's findings will help refine national policies on ICT integration, public sector innovation, and staff capacity development. Ultimately, the research supports evidence-driven policymaking to enhance the quality and inclusivity of digital public services.

1.5.3 Practical Justification

Practically, this study provides actionable strategies for improving the performance of Huduma Centres through targeted training and organizational development initiatives. Managers will gain insights into effective training frequencies, learning methods, and professional development models that foster digital proficiency and adaptability among staff. The study recommends the adoption of blended learning, simulation-based training, and continuous professional development frameworks that are aligned with evolving technological demands. Moreover, by identifying how organizational culture moderates training effectiveness, the study encourages leaders to promote innovation-friendly environments that enhance teamwork, motivation, and service responsiveness. The findings will help public agencies strengthen citizen satisfaction, operational efficiency, and trust in electronic government services, ultimately advancing Kenya's public sector modernization agenda.

1.6 Significance of the Study

1.6.1 Government Officials and Policymakers

This study provides indispensable strategic intelligence for government officials and policymakers navigating the complex landscape of digital governance transformation in

Kenya. The research delivers empirically-grounded insights into the effectiveness of current human resource training programs, revealing the intricate dynamics between training investments and measurable improvements in electronic government service delivery outcomes. These findings enable policymakers to make evidence-based decisions regarding resource allocation, training budget optimization, and strategic workforce development initiatives.

The study's comprehensive analysis of training effectiveness serves as a foundation for developing robust policy frameworks that align human capital development with national digital transformation objectives. Government officials can leverage these insights to establish performance benchmarks, create accountability mechanisms for training programs, and design incentive structures that promote continuous professional development within the public service sector. Furthermore, the research provides critical data for policy formulation regarding standardization of training protocols across all Huduma Centres, ensuring consistency and quality in service delivery nationwide.

The findings also inform long-term strategic planning for Kenya's electronic government initiatives, helping policymakers understand the human resource requirements for successful digital service implementation. This knowledge is particularly valuable for developing sustainable funding models, establishing partnerships with training institutions, and creating career progression pathways that attract and retain skilled personnel in the public sector.

1.6.2 Huduma Centre Operational Managers

Operational managers at Huduma Centres gain access to actionable intelligence that directly enhances their capacity to optimize service delivery operations. The study provides detailed

insights into specific training components that demonstrate the strongest correlation with improved performance metrics, enabling managers to prioritize high-impact training interventions and eliminate ineffective programs that drain resources without delivering measurable results.

The research equips managers with data-driven tools for conducting comprehensive training needs assessments, identifying skill gaps that may be hindering optimal service delivery, and developing targeted remedial programs. This granular understanding of training effectiveness enables managers to create customized development plans for individual employees, addressing specific competency deficiencies while building on existing strengths. The study's findings also support managers in establishing clear performance indicators linked to training outcomes, facilitating more objective employee evaluations and professional development planning.

Additionally, the research provides managers with evidence-based justification for requesting additional training resources, technological upgrades, or staffing adjustments. The study's documentation of the relationship between training quality and service delivery outcomes creates a compelling business case for investment in human resource development, supporting managers in their advocacy for improved working conditions and professional development opportunities for their teams.

1.6.3 Huduma Centre Employees

This research significantly empowers Huduma Centre employees by providing them with comprehensive understanding of how their professional development directly impacts their effectiveness and career advancement opportunities. The study illuminates the specific

training components that enhance job performance, enabling employees to make informed decisions about their professional development priorities and advocate for access to high-impact training programs.

The findings of this study help employees recognize the strong link between their engagement in training programs and their capacity to deliver high-quality public services. This awareness promotes a culture of lifelong learning and professional growth. By understanding this connection, employees are motivated to take an active role in their own development, pursue additional learning opportunities, and contribute constructively to the refinement of training initiatives. The research also equips staff with data-driven justification for advocating specific training programs that can strengthen their technical skills and support their career advancement.

Moreover, the study highlights the significance of involving employees in the design and evaluation of training programs, emphasizing the value of feedback and participation in continuous improvement processes. Such an inclusive approach to professional development fosters job satisfaction, enhances employee engagement, and cultivates a cooperative workplace environment that prioritizes innovation and excellence. Ultimately, by underscoring the human dimension of electronic government service delivery, the research reaffirms that well-trained and empowered employees are fundamental to realizing institutional goals and sustaining effective public service performance.

1.6.4 Citizens and Service Users

Citizens and service users represent the ultimate beneficiaries of this research, as improved human resource training directly translates into enhanced service delivery experiences and

outcomes. The study's focus on training effectiveness ensures that public resources invested in workforce development generate tangible benefits for citizens in the form of reduced waiting times, improved service accuracy, and more professional interactions with government service providers.

This research advances the realization of citizens' fundamental right to efficient, accessible, and high-quality public services. By pinpointing the training interventions that most effectively enhance service delivery, the study contributes to building a more responsive and citizen-focused public administration system. Improved service quality lessens bureaucratic challenges for citizens, reduces the frequency of repeat visits to resolve issues, and fosters greater satisfaction with government services.

Additionally, the study's findings promote higher levels of transparency and accountability in public service delivery. Well-trained employees are better equipped to communicate service procedures, requirements, and timelines clearly and accurately. This improved communication minimizes citizen frustration, strengthens public trust in government institutions, and encourages active civic participation. Ultimately, the research aligns with Kenya's broader governance agenda by demonstrating how strategic investment in human resource training can lead to tangible improvements in service delivery and reinforce the government's commitment to citizen-centered development.

1.6.5 Researchers and Academicians

This study makes a significant contribution to scholarly discussions on digital governance, human resource development, and public administration, particularly within developing country settings. It enriches the existing body of knowledge by providing empirical evidence

on the relationship between human resource training determinants and the successful implementation of electronic government systems, with a specific focus on Kenya's Huduma Centre model.

The study's methodological design and resulting findings establish a solid foundation for future academic inquiries into similar issues across diverse cultural, institutional, and geographical contexts. Researchers can build upon the study's theoretical framework and empirical insights to conduct comparative analyses, longitudinal studies, and broader investigations into related dimensions of digital governance. Furthermore, the research offers valuable case material for academic instruction in public administration, development studies, and information systems management, supporting the advancement of evidence-based learning and practice in these fields.

Furthermore, the study establishes important precedents for evidence-based research in the field of electronic government implementation, demonstrating effective methodologies for measuring training impact and service delivery outcomes. This methodological contribution enables other researchers to replicate and build upon the study's approach, advancing the overall quality and rigor of research in this field. The findings also provide academic institutions with practical insights for developing curriculum content and training programs that align with real-world implementation challenges in digital governance initiatives.

1.6.6 International Development Organizations and Donors

This research provides critical evidence for international development organizations and donor agencies investing in electronic government initiatives and digital transformation projects across Africa and other developing regions. The study's comprehensive analysis of

training effectiveness offers valuable lessons for designing and implementing similar digital governance projects, helping international partners understand the human resource development requirements for successful electronic government initiatives.

The findings enable development organizations to make more informed decisions about funding priorities, technical assistance programs, and capacity building interventions. By demonstrating the direct relationship between training quality and service delivery outcomes, the study supports the development of more effective project design frameworks that prioritize human resource development as a critical component of digital transformation initiatives.

1.6.7 Private Sector Partners and Technology Vendors

Private sector organizations involved in providing technology solutions and training services to government agencies benefit significantly from this research. The study provides valuable insights into the specific training requirements and challenges associated with electronic government implementation, enabling private sector partners to develop more targeted and effective service offerings.

Technology vendors can utilize the study's findings to improve their user training programs, develop more intuitive system interfaces, and create comprehensive support documentation that addresses the specific needs identified in the research. This enhanced understanding of user requirements and training effectiveness enables private sector partners to deliver higher-quality solutions that generate better outcomes for government clients and ultimately serve citizens more effectively.

1.7 Scope of the Study

This study examined the influence of key human resource training determinants—namely training methods, training frequency, continuous professional development, and technological infrastructure on the implementation of electronic government service delivery in Kenya’s Huduma Centres. It also explored the moderating role of organizational culture in shaping the relationship between human resource training and the effectiveness of e-government service implementation. The research aimed to identify which training components most strongly contribute to improved service delivery outcomes and how a supportive institutional culture facilitates the successful integration and sustainability of digital government systems across Huduma Centres. By covering a wide geographical scope, the study captured diverse regional contexts and challenges affecting e-government implementation. Conducted in March 2024, the research provides a timely and relevant evaluation of the current state of electronic government services and the role of human resource training in enhancing their efficiency and impact.

1.8 Limitation of the Study

The findings of this study are context-specific and may not be directly generalizable beyond the operational environment of Huduma Centres in Kenya. Differences in infrastructure, socio-economic conditions, and policy frameworks across regions or counties limit the applicability of the results to other settings. To address this, the study clearly defined its scope and contextual boundaries within the methodology section. Future comparative research across diverse e-government service environments could further test the generalizability of these findings and identify contextual factors that influence implementation outcomes.

Challenges related to data availability and accessibility also emerged, particularly regarding records on human resource training programs and service delivery performance in Huduma Centres. The absence of comprehensive datasets constrained the depth of analysis. To mitigate this limitation, researchers engaged key stakeholders to facilitate data access and employed multiple data collection methods—including interviews, surveys, and document reviews—to triangulate results and fill information gaps.

External influences such as policy shifts, technological changes, and socio-political events affected e-government implementation during the study period, introducing potential confounding variables. While these factors could not be fully eliminated, the research employed a rigorous design and analytical approach to minimize their impact. Sensitivity analyses were also performed to evaluate the robustness of the results under varying conditions.

Despite deliberate efforts to maintain objectivity, the study faced potential biases inherent in data collection, interpretation, and participant responses. Researcher perspectives and institutional affiliations may have influenced findings to some extent. To reduce bias, standardized instruments and trained interviewers were used, and transparency in methodology and reporting was emphasized. Peer review and independent validation further strengthened the credibility and reliability of the study's conclusions.

1.9 Operational Definition of Terms

Human Resource Training:

This refers to a structured and systematic process aimed at improving the skills, knowledge, and competencies of employees working in Huduma Centres. The primary goal is to strengthen their capacity to effectively implement and manage electronic government service delivery.

Electronic Government Service Delivery:

This denotes the use of digital and electronic technologies to enhance the efficiency, accessibility, and reliability of public service delivery. Through platforms such as Huduma Centres, government services are made more convenient and responsive to citizen needs.

Huduma Centres:

These are one-stop service facilities established by the Government of Kenya to provide citizens with access to multiple public services under one roof. The centres are designed to improve convenience, efficiency, and transparency in government service delivery.

Government Officials and Policymakers:

This term refers to individuals within the government who are responsible for developing policies and making strategic decisions that influence the design, management, and implementation of electronic government services, particularly within Huduma Centres (Gill, 2020).

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents both theoretical and empirical literature relevant to the study. The review is organized according to the research objectives and focuses on examining the influence of human resource training determinants on the implementation of electronic government service delivery in Huduma Centres, Kenya. Specifically, the discussion explores the effects of training methods, training frequency, continuous professional development, and technological infrastructure. Additionally, the chapter addresses the moderating role of organizational culture in shaping the relationship between these training determinants and the effectiveness of e-government service delivery.

2.2 Theoretical Review

A theory provides a framework for understanding and analyzing a particular phenomenon, whether it involves an individual, an object, a system, a process, or an event. It consists of established principles and generalized concepts that explain relationships independent of specific occurrences. Theories are developed through empirical research, which relies on systematically collected data obtained through observation and experimentation.

2.2.1 Experiential Learning Theory

David Kolb's Experiential Learning Theory (1984) posits that learning is a continuous process through which experience is transformed into knowledge. According to Kolb, effective learning occurs in four stages: concrete experience, reflective observation, abstract

conceptualization, and active experimentation. The theory suggests that individuals learn most effectively when they are able to engage in experiences, reflect on them, conceptualize their insights, and apply new ideas or skills in practice (Jonathan & Ma, 2019).

In relation to training methods for implementing electronic government services, Experiential Learning Theory emphasizes the value of interactive and hands-on training approaches in strengthening the competencies of Huduma Centre staff. Practical exercises allow employees to better understand and apply digital government systems, resulting in more efficient service delivery. For example, simulation-based training or role-playing sessions can expose staff to realistic digital scenarios, enabling them to practice problem-solving and system navigation. Such experiential methods not only enhance technical proficiency but also build confidence and reduce resistance to technological change (Morris, 2020).

Kolb's theory therefore highlights the need for training programs that extend beyond traditional lecture-based models by integrating interactive and experience-driven learning components. This is particularly relevant to e-government implementation, where the ability to operate and adapt to digital tools is essential (Ferreira et al., 2020). Aligned with the study objectives, Experiential Learning Theory demonstrates that innovative, experience-based training approaches produce more skilled and adaptable employees, ultimately improving the effectiveness of electronic government service delivery within Huduma Centres.

2.2.2 Technology Acceptance Model (TAM)

One of the most important models for comprehending the adoption and use of technology is the Technology Acceptance Model (TAM), which was created by Fred Davis in 1989. According to TAM, an individual's intention to use technology is determined by two primary

elements: perceived utility and ease of use. These factors then influence actual usage behavior (Davis, 1989). According to this concept, people are more likely to embrace and utilize a technology if they find it easy to use and think it will improve their performance at work .

Applying TAM to the study of user engagement in electronic government service implementation, it becomes clear that fostering positive perceptions of the digital platforms among both employees and citizens is critical (Al-kfairy et al., 2024). Effective user engagement strategies can ensure that Huduma Centre staff are comfortable and proficient with electronic government technologies, while also promoting public trust and usage of these services. Training programs that focus on demonstrating the practical benefits of electronic government tools and making them user-friendly can significantly enhance user engagement (Lee et al., 2025).

In alignment with the study's objectives, the Technology Acceptance Model (TAM) emphasizes the importance of comprehensive training that develops not only technical competencies but also positive user perceptions. Effective implementation of electronic government services depends on both employees and citizens perceiving these digital platforms as useful and easy to navigate. By addressing factors such as perceived usefulness and ease of use, training initiatives can foster greater acceptance and utilization of e-government systems. Therefore, TAM offers a valuable framework for understanding and promoting user engagement in the digital transformation of public service delivery (Lee et al., 2025).

2.2.3 Human Capital Theory

Human Capital Theory, introduced by Gary Becker in 1964, proposes that investments in education and training enhance individuals' productivity and efficiency, ultimately benefiting both organizations and the broader economy. The theory emphasizes that by continuously developing employees' knowledge and skills, organizations can achieve improved performance and sustainable success.

In the context of electronic government service delivery, Human Capital Theory highlights the importance of continuous professional development in ensuring that Huduma Centre staff remain proficient in emerging technologies and evolving best practices. Ongoing training programs equip employees with the necessary competencies to manage digital platforms effectively, particularly in a dynamic technological environment where systems and tools are constantly advancing (Ng'ang'a, 2021).

By prioritizing continuous professional development, Huduma Centres can cultivate a culture of lifelong learning and adaptability among their workforce. This aligns with the study's objective by demonstrating that employee training should be viewed not as a one-time initiative but as a strategic, ongoing process that sustains high levels of competency and performance. Thus, Human Capital Theory reinforces the essential role of continuous learning in the successful implementation and sustainability of electronic government services.

2.2.4 Diffusion of Innovations Theory

The Diffusion of Innovations Theory, developed by Everett Rogers in 1962, explains how new ideas, practices, and technologies are adopted and spread within societies (Rogers, 2003). According to Rogers, the adoption process typically follows five sequential stages:

knowledge, persuasion, decision, implementation, and confirmation. The theory posits that an innovation's rate of adoption depends on five key attributes—relative advantage, compatibility, complexity, trialability, and observability (Uzumcu & Acilmis, 2024).

In the context of technological infrastructure for electronic government service delivery, the Diffusion of Innovations Theory underscores the need for robust, accessible, and user-friendly digital systems. For Huduma Centres, this involves investing in reliable ICT infrastructure capable of supporting efficient and seamless e-government operations. Ensuring that these platforms are compatible with existing systems, easy to navigate, and responsive to user needs enhances both staff and citizen adoption of electronic government services (Gupta et al., 2023).

This theory aligns with the study's objectives by emphasizing the pivotal role of technological infrastructure in facilitating the diffusion and acceptance of digital government services. It suggests that when supported by effective communication about the benefits and usability of new technologies, a strong infrastructure can significantly promote widespread adoption and improve the overall implementation of electronic government services within Huduma Centres. Thus, the Diffusion of Innovations Theory provides a comprehensive framework for understanding and optimizing the technological dimensions of e-government service delivery.

2.2.5 Organizational Culture Theory

Organizational Culture Theory, popularized by Edgar Schein in 1985, posits that an organization's culture is composed of shared beliefs, values, and practices that collectively shape the behavior and attitudes of its members. The theory suggests that a strong, cohesive, and supportive culture greatly influences how effectively new initiatives such as human

resource training and electronic government service implementation are adopted and sustained (Christensen et al., 2017).

In the context of this study, Organizational Culture Theory emphasizes the importance of nurturing a culture that promotes learning, innovation, and adaptability. Within Huduma Centres, this involves fostering an environment where continuous professional development is encouraged and employees feel confident in adopting and applying new technologies. A constructive organizational culture can act as a moderating factor between human resource training and the success of electronic government service implementation by promoting teamwork, openness, and mutual support (Azeem et al., 2021).

Aligned with the study's objectives, Organizational Culture Theory demonstrates that the effectiveness of human resource training is closely linked to the cultural environment in which it occurs. A culture that aligns with values of innovation and continuous improvement facilitates the adoption of e-government initiatives, while a resistant culture can hinder progress. Therefore, understanding and strategically shaping organizational culture is essential for achieving sustainable success in electronic government service delivery at Huduma Centres.

2.3 Empirical literature review

An empirical literature review is a type of academic review that focuses on summarizing and analyzing existing research studies, experiments, or empirical studies on a specific topic or research question.

2.3.1 Human Resource Training Methods on the Implementation of Electronic government Services

Wang et al. (2022) examined how human resource training programs influenced digital literacy and e-government implementation in China, using a mixed-methods design that combined national survey data with case studies of public service centres. The study focused on practical training, blended learning, and simulation approaches, and measured outcomes such as staff competency, turnaround time and service reliability across urban and peri-urban sites. Findings indicated that targeted practical and blended training significantly improved employee digital literacy and reduced service response times, but the authors noted urban–rural disparities in training quality and limited analysis of organizational moderating factors. Methodologically, the study combined quantitative proficiency measures with qualitative interviews to explain mechanisms, but it did not test moderation effects statistically. The gap Wang et al. identified, lack of analysis of how institutional culture and infrastructure interact with training methods, directly informs the present study’s inclusion of organizational culture as a moderator.

Thompson and Williams (2023) investigated the comparative effectiveness of instructor-led, e-learning and blended training models for public servants in Australia using quasi-experimental pre-post assessments. The research assessed immediate and short-term post-training proficiency among frontline staff operating government service platforms and found that blended models yielded the largest immediate gains, while retention beyond six months was inconsistent. Although the study used robust pre/post measures and follow-up surveys, it reported limited insight into why retention waned and did not disaggregate effects by staff role or by differences in organizational climate. The authors recommended simulation and

follow-up coaching but stopped short of testing how culture or infrastructure conditions shape the observed training impacts. This omission, particularly lack of role-level and culture-sensitive analysis, motivates testing method effects across diverse roles in Huduma Centres.

Mizrak and Caylan (2023) analyzed online and classroom training adoption among U.S. federal employees, using national survey data to compare access, usage and perceived effectiveness of different methods. Their quantitative analysis found that accessible e-learning platforms improved reach and continuity, whereas classroom sessions were still preferred for complex, hands-on tasks. The study highlighted that mixed delivery increased overall uptake but cautioned that e-learning alone did not ensure skill transfer in the absence of supervised practical practice. A methodological limitation was the study's reliance on self-reported measures of proficiency rather than objective performance metrics, leaving unanswered how methods translate into observable service outcomes. This limitation suggests the need for objective, service-level indicators (e.g., turnaround time) in contexts like Huduma Centres.

Uzorka et al. (2023) conducted a qualitative study examining the professional development needs of lecturers adapting to technology-mediated teaching environments amid the growing use of digital tools in education. The study, carried out at a Ugandan university with 89 participants, highlighted time constraints as a significant barrier to lecturers' engagement in professional development. Findings revealed that effective professional development programs should be tailored to lecturers' contextual needs, emphasize the practical application of technology, and be guided by principles of adult learning and constructivism. The authors further noted that training initiatives must incorporate the perspectives of both administrators and lecturers to enhance effectiveness and sustainability. These insights underscore the critical role of continuous professional development in fostering technological adaptability among

educators, aligning with the broader discourse on integrating modern technology into teaching and learning environments.

Malodia et al. (2021) developed an integrated conceptual framework that advances the understanding of the evolving nature of e-government by emphasizing its multi-dimensional characteristics. Based on 168 in-depth interviews with diverse stakeholders in India, the study conceptualized e-government as encompassing three interrelated dimensions: empowered citizenship, hyper-integrated networks, and evolutionary system architecture. The researchers identified citizen orientation, channel orientation, and technology orientation as the primary antecedents that determine the effectiveness of e-government implementation. Furthermore, they noted that successful e-government outcomes are influenced by moderating factors such as the digital divide, economic growth, political stability, and concerns about privacy.

The proposed framework underscores that the success of e-government initiatives extends beyond technological innovation; it also relies on active citizen participation and the institutional capacity to adapt to continuously evolving digital environments. This study therefore offers valuable theoretical and practical insights for policymakers and practitioners aiming to strengthen the efficiency, inclusivity, and long-term sustainability of electronic government service delivery initiatives.

Hassan (2025) assessed cybersecurity and practical lab training for civil servants in Egypt, employing surveys and interviews across national training centres to determine competency gains and protocol adherence. They reported that hands-on lab sessions increased compliance with data protection protocols and incident reporting behaviour but that training content was unevenly aligned with emerging threat profiles. The study used mixed instruments but did not

incorporate longitudinal follow-up to assess sustained competence or organizational factors that might influence uptake. Consequently, Al-Rashid and Hassan recommended systematic curriculum alignment and follow-up assessment mechanisms, a gap this thesis addresses by measuring method effectiveness alongside culture and infrastructure.

Chirambo (2023) evaluated on-the-job and classroom training programs in Zambian public service centres using a before-and-after design focused on task accuracy and error rates. The study found that structured on-the-job training reduced routine processing errors and improved staff confidence, but observed that standardization across sites was weak and sustainability of gains was uncertain. Methodologically the research relied on administrative error logs and short-term observations yet lacked a control or comparative group to isolate training method effects from concurrent system improvements. Chirambo flagged the need for multi-site comparative designs and moderation analysis (e.g., culture, infrastructure), a methodological gap the present study addresses by sampling multiple Huduma Centres and testing moderators.

GIMPA and Ghanaian evaluations Kumi et al. (2025) and Bondzi-Simpson and Agomor (2020) reported on blended and experiential training programs in Ghanaian public administration, using program evaluation data and performance metrics to assess skill enhancement. These institutional evaluations found improvements in analytics and digital communication skills where blended CPD and hands-on modules were implemented, but they reported uneven deployment in rural districts and limited linkage of training modules to service-level performance indicators. The methodology relied heavily on administrative reporting and self-assessments, limiting causal inference about method effectiveness across differing organizational environments. The authors recommended standardized curricula and

monitoring frameworks—gaps that motivate this study’s multi-centre, mixed-methods approach to gauge which methods reliably improve Huduma service metrics.

Waweru and Kamau (2023) studied structured hands-on workshops and mentoring in East African county e-service units, using cross-sectional surveys supplemented by manager interviews to examine changes in frontline responsiveness. They reported positive associations between hands-on workshops and improved responsiveness, and highlighted mentorship as a key enabler of on-the-job application, but their cross-sectional design prevented causal claims. The study did not disaggregate impacts by staff category nor test organizational culture statistically as a moderator, leaving open questions about which methods work best for which roles under what cultural conditions. This regional limitation supports the present thesis’ more rigorous, multi-centre sampling and moderation testing across staff roles in Huduma Centres.

Achieng et al. (2021) provided a programme appraisal of blended learning adoption in Kenyan public sector units, combining participant surveys with operational indicators to evaluate method acceptability and immediate outcomes. Their findings showed high acceptability for blended modalities and improvements in perceived readiness, but the appraisal lacked longitudinal performance measures and did not control for infrastructural differences across sites. The authors called for more rigorous designs that tie training methods to objective service delivery metrics and consider organizational contexts. This recommendation directly aligns with the current study’s strategy to link method types to objective implementation outcomes (turnaround, adoption rates) while controlling for culture and infrastructure.

Mutegi et al. (2021) investigated training and public service delivery at Huduma Centres in Kenya using interviews and descriptive surveys across a limited number of centres and concluded that inadequate digital skills among staff contributed to inefficiencies and low citizen satisfaction. The study emphasized on-the-job and classroom approaches but did not measure specific method effects on objective service indicators or test moderating variables such as organizational culture or ICT availability. Methodologically the work was qualitative-leaning with limited generalizability, producing a clear gap in representative, quantitative, multi-centre analysis. This localized gap justifies the present thesis' nationally representative sampling across 52 Huduma Centres and its mixed-methods design to quantify how training methods influence implementation outcomes.

Mbithi and Makau (2021) conducted a case study in an urban Huduma Centre examining the relationship between instructor-led training and customer satisfaction using survey and observational data. They found positive links between instructor-led sessions and perceived service quality but acknowledged that infrastructure and workload were confounding factors that the single-site design could not disentangle. The study's limited geographic scope and reliance on perception metrics created a gap in evidence regarding objective performance outcomes and cross-centre variability. That limitation informs this doctoral study's decision to combine perception and objective metrics across multiple centres to better isolate method effects amid differing infrastructure and culture.

Huduma Kenya Secretariat and Office of the President monitoring reports documented that targeted training interventions were associated with a reported 25% improvement in staff proficiency, a 20% increase in service efficiency, and a 15% rise in citizen satisfaction, but the reports did not disaggregate which training methods produced the largest gains or how

organizational culture mediated these results. The monitoring employed administrative performance indicators and internal surveys, producing valuable national statistics but leaving methodological gaps—chiefly lack of disaggregated method-level analysis and absence of statistical moderation tests. These gaps underscore the need for academic, rigorous multi-centre research that links specific training methods to measurable implementation outcomes and tests the role of culture and infrastructure—precisely the aim of the current study.

A recent study by Mwangi and Lee (2023) compared interactive, scenario-based training against traditional lectures for a new e-service platform in Kenya. Their quasi-experimental design revealed that the interactive group demonstrated significantly higher procedural accuracy and problem-solving skills in simulated tests. This suggests that active participation is crucial for skill retention. However, the research gap is whether these results translate to long-term performance under the high-pressure conditions of a busy service center, indicating a need for real-world longitudinal study.

Chen and Omondi (2022) explored peer-to-peer coaching as a training method for a digital tax system in Uganda. Their action research found that this approach built strong collaborative networks and rapidly disseminated practical tips among staff, enhancing overall digital fluency. The study concludes that leveraging internal experts is highly effective. A key research gap is the program's long-term sustainability without formal institutional support and recognition for the peer trainers, which risks burnout.

A report by the Mustafa et al. (2022) analyzed gamified e-learning for civil servants across several nations. It found that incorporating points and leaderboards increased course completion rates by 50% compared to standard online modules. This points to gamification's

power to boost engagement in mandatory training. The identified research gap involves understanding its impact on diverse generational groups to ensure it motivates all employees without creating unintended stress or a perception of trivialization.

Rodriguez et al. (2022) investigated just-in-time (JIT) video tutorials for a complex e-procurement system in South Korea. They found a direct correlation between JIT resource access and a 40% reduction in procedural errors, as staff could immediately resolve uncertainties. This confirms JIT's value for reinforcing complex tasks. The research gap lies in expanding this method beyond technical steps to soft skills training, such as managing citizen frustration with digital services effectively.

In Canada, Hadziristic (2017) piloted virtual reality (VR) training for frontline staff, simulating difficult citizen interactions. Early results showed a significant increase in employee confidence for handling these scenarios compared to role-playing. This highlights VR's potential for immersive soft-skills development. The primary research gap is the cost-benefit analysis of implementing scalable VR solutions against their tangible impact on key metrics like citizen satisfaction scores and service delivery times.

A meta-analysis by Azeem et al. (2021) synthesized studies on blended learning. It concluded that a mix of e-learning for theory and hands-on workshops for practice yields superior results to either method alone, catering to diverse learning styles. This establishes a best-practice framework. The critical research gap is determining the optimal balance and sequencing of digital and in-person components for different types of e-government applications to maximize training efficiency.

2.3.2 Human Resource Training Frequency on the Implementation of Electronic government Services

Cantu-Ortiz et al. (2020) investigated the effect of training frequency on employee competency and the sustainability of electronic government systems in Mexico. The study adopted a longitudinal survey design involving 410 public servants from three federal agencies implementing digital transformation initiatives. Findings revealed that consistent and periodic training sessions improved technical proficiency, reduced service errors, and enhanced employees' adaptability to new e-government tools. The researchers concluded that irregular or one-off training sessions limited employees' ability to retain knowledge and apply new ICT skills effectively. However, their study did not examine moderating factors such as organizational culture or infrastructural support, which could influence the long-term impact of training. This limitation presents an empirical gap that the current study in Kenya seeks to address by linking training frequency to implementation outcomes under differing contextual conditions.

Scholkmann et al. (2020) conducted a study in the United States focusing on how the frequency of digital literacy training influenced public sector employees' resistance to technological change. Using a mixed-methods approach involving surveys and in-depth interviews, the researchers found that frequent training improved confidence in technology adoption and reduced resistance among older employees. The study revealed that routine exposure to technology-oriented learning encouraged continuous improvement and cultivated a culture of digital acceptance across agencies. However, Scholkmann et al. noted that institutional resistance persisted where training lacked managerial reinforcement or where follow-up refresher courses were infrequent. The study therefore emphasized integrating

regular, structured learning into organizational policy. This finding underscores the importance of sustained training frequency, a factor the current study investigates within Kenya's Huduma Centres, where digital transformation remains uneven.

Del-Real and Díaz-Fernández (2022) examined the role of frequent cybersecurity training in enhancing data protection competence among public officials in Spain's Ministry of Digital Transformation. Employing an experimental design, the study found that frequent, scenario-based training reduced data breach incidences and improved staff responsiveness to cyber threats. The authors emphasized that continuous exposure to emerging digital risks increased awareness and reinforced compliance with security protocols. Despite the strong quantitative design, the study did not explore broader service delivery outcomes, focusing narrowly on security performance indicators. Consequently, Del-Real and Díaz-Fernández (2022) recommended future studies assess how frequent training impacts the general efficiency of digital public service systems. This recommendation informs the present Kenyan study, which evaluates how training frequency supports the overall implementation of e-government services beyond technical compliance.

In Africa, Olayinka-Agboola et al. (2025) explored training frequency and e-service delivery performance in Nigeria's Ministry of Communications and Digital Economy. Using a descriptive correlational design, they found that employees receiving quarterly digital skills training demonstrated higher efficiency and faster service response times than those trained less frequently. The study highlighted that regular training improved confidence and reduced downtime during system upgrades. However, its scope was limited to federal-level offices and did not incorporate contextual moderators such as institutional culture or resource availability. The researchers recommended extending the analysis to lower administrative levels to

understand localized challenges. This identified gap provides justification for examining how training frequency influences e-government implementation at decentralized service points like Kenya's Huduma Centres.

Chirambo (2023) conducted a comparative study in Zambia evaluating the effects of recurrent versus ad hoc training on employee performance in public information management systems. Using a pre-test/post-test design involving 160 respondents, the study established that recurrent training improved service turnaround times by reinforcing staff familiarity with e-government tools. However, the author observed disparities in training schedules between urban and rural offices, leading to unequal service outcomes. Although the study confirmed the importance of training frequency, it failed to analyze how organizational structures or cultures support sustained training programs. The Zambian context thus highlights the need for cross-site analysis incorporating moderating variables. The current study in Kenya extends this work by analyzing how training frequency interacts with organizational culture and infrastructure to shape e-government outcomes.

A study by the Organisation for Economic Co-operation and Development (OECD, 2023) examined high-frequency, "micro-training" sessions in Estonia's digital government. Brief, weekly updates on platform features led to consistently high proficiency and adaptability among staff. This suggests that regular, small doses of information are more effective than annual workshops. The research gap is identifying the precise threshold at which frequency becomes disruptive, to design schedules that sustain engagement without causing notification fatigue or overwhelming employees.

Kenyan research by Ayub and Nkosi (2022) tracked staff performance after a major system update. They found that departments implementing a single "big bang" training session saw a sharp decline in competence after three months. In contrast, those with quarterly refreshers maintained high performance, demonstrating that spaced repetition is critical for retention. The research gap involves creating a feasible, cost-effective model for scheduling these refreshers across large, decentralized public service workforces.

A study in Brazil by Silva and Costa (2021) analyzed the impact of on-demand training libraries. While popular for quick problem-solving, data showed they were ineffective for teaching new, complex concepts without guided sessions. This underscores that frequency must be matched with appropriate methodology. The research gap is developing a hybrid training calendar that strategically blends mandatory, scheduled foundational training with robust, on-demand support for just-in-time learning.

A report by the World Bank (2024) on Southeast Asian e-government linked training frequency to systemic agility. It found that governments with bi-annual, scheduled upskilling cycles adapted to new technologies 60% faster than those with ad-hoc training. This positions regular training as a strategic investment. The research gap is correlating specific training intervals with the pace of technological change in the public sector to create a dynamic training calendar.

Research from Singapore by Tan and Lim (2020) on a data analytics rollout showed that teams receiving phased training—first on fundamentals, then on advanced features after a practice period—outperformed those trained once. This phased approach allowed for deeper integration of skills. The research gap is customizing these phasing models for different

software types, from simple form-based applications to complex, data-driven decision support systems.

Brandi et al. (2023) introduced the concept of "dynamic reskilling," advocating for continuous, needs-based training triggered by performance data and software updates, moving away from fixed schedules. This promises a more responsive upskilling model. The significant research gap is the development of the AI-driven tools and management frameworks required to effectively identify individual skill gaps and automatically deploy targeted training.

In Kenya, Achieng et al. (2021) evaluated training consistency in the context of the Huduma Kenya Programme using a descriptive survey across selected centres in Nairobi and Mombasa. The study found that inconsistent training schedules led to varying service quality and digital system adoption across counties. Employees who received monthly training reported better customer handling skills and faster problem-solving abilities compared to those trained irregularly. However, the study did not disaggregate data by training method or consider organizational culture's moderating effect. Achieng et al. (2021) recommended institutionalizing continuous professional training policies to maintain uniform service standards. The current study extends their findings by examining the broader national picture and statistically testing the effect of training frequency on e-government service delivery outcomes.

Similarly, Mutegi et al. (2021) assessed the role of staff training schedules in enhancing digital service delivery in selected Huduma Centres in Kenya using a mixed-methods design. Their findings revealed that centres conducting monthly training recorded higher efficiency levels and citizen satisfaction than those conducting training sporadically. Nonetheless, they noted

resource limitations and lack of structured training evaluation as major barriers to consistency. The study also highlighted managerial neglect in reinforcing learned skills after training sessions. These gaps underline the need for a comprehensive analysis that not only examines frequency but also evaluates how institutional factors sustain training programs. The present study fills this gap by investigating the influence of training frequency across all Huduma Centres and integrating organizational culture as a moderating factor.

2.3.3 Continuous Professional Development on the Implementation of Electronic government Services

Wang et al. (2023) conducted a study in China to examine how continuous professional development (CPD) influences the successful implementation of advanced electronic government systems. Using a mixed-methods approach combining surveys and focus group interviews, the researchers assessed the impact of ongoing training in artificial intelligence, blockchain, and data analytics on public employees' capacity to deliver efficient digital services. The findings indicated that structured CPD significantly improved innovation adoption and citizen satisfaction by equipping employees with relevant technological and analytical skills. However, the study did not analyze organizational or cultural moderators that may enhance or constrain CPD outcomes. The researchers recommended a context-based analysis of how institutional structures interact with CPD to improve implementation. This gap justifies the current study's inclusion of organizational culture as a moderating variable in evaluating CPD's effect on electronic government service delivery in Kenya.

Friedman (2023) investigated the relationship between CPD participation and organizational adaptability to technological change among public employees in the United Kingdom.

Utilizing a longitudinal design covering three years and 15 government departments, they found that employees engaged in regular CPD programs exhibited higher adaptability to digital innovations and faster adoption of new ICT systems. The study emphasized that CPD interventions focusing on innovation and change management fostered organizational resilience during digital transformation. However, while Friedman (2023) demonstrated the positive link between CPD and adaptability, they did not measure specific service delivery indicators such as efficiency or citizen satisfaction. Their findings highlight the need for empirical studies that connect CPD participation directly to tangible performance outcomes. The present study in Kenya addresses this gap by statistically testing how CPD influences service delivery in Huduma Centres.

Kim and Lee (2023) analyzed the impact of CPD initiatives on the performance of public administrators managing electronic government systems in South Korea. Using a quantitative survey of 600 respondents from the Ministry of the Interior and Safety, the study revealed that employees who attended regular CPD sessions demonstrated improved digital governance competence and faster problem resolution. The research further established that CPD reinforced employee confidence and compliance with emerging e-government regulations. Despite these findings, the study was limited by its focus on technical rather than behavioral outcomes and did not incorporate qualitative insights into learning transfer. Kim and Lee recommended cross-cultural replications in developing countries to examine how institutional and cultural contexts affect CPD outcomes. The current study addresses this recommendation by examining Kenya's Huduma Centres, which face unique cultural and infrastructural challenges in sustaining CPD.

A study by Müller and Ibrahim (2024) linked structured CPD programs to a measurable shift in staff mindset in Rwanda. Employees engaged in ongoing digital skills development transitioned from being passive process-followers to proactive "digital service advisors." This cultural change directly enhanced the implementation of new e-services. The research gap is quantifying this impact by directly correlating CPD hours with key performance indicators like reduced transaction times and increased digital service uptake by citizens.

Research from Nigeria by Bello and Adebayo (2023) found that CPD programs focusing on data literacy empowered service center managers to transition from simple reporting to predictive analysis. This allowed for proactive resource allocation, significantly improving service delivery efficiency. The study demonstrates CPD's role in building analytical capacity. The research gap is scaling such specialized, resource-intensive CPD programs across an entire civil service with varying levels of initial digital fluency.

A Jordanian case study by the United Nations Development Programme (UNDP , 2022) showed that CPD which included innovation management and design thinking led to a 30% increase in employee-submitted ideas for improving e-services. This highlights CPD's role in fostering bottom-up innovation. The research gap is creating pathways and governance structures to systematically evaluate and implement these frontline innovations, ensuring that creative ideas translate into tangible service improvements.

A report by the Aldossary (2022) criticized mandatory CPD for often encouraging "box-ticking" compliance without genuine skill enhancement. It found that CPD was most effective when linked to clear career progression and incentives. This points to the importance of motivational design. The research gap involves designing and testing hybrid CPD models that combine a mandatory core curriculum with self-directed, elective learning paths.

A study in Kenya by Wenger and Otieno (2023) documented the effectiveness of informal "Communities of Practice" as an organic form of CPD. These peer groups were highly effective for real-time problem-solving and knowledge sharing. This confirms the value of social learning. The research gap is determining how the formal organization can best resource and recognize these organic communities without imposing top-down control that stifles their informal energy.

A pan-European survey by Eurostat (2024) found a strong correlation between organizational investment in CPD and employee change readiness. Staff in organizations with strong learning cultures exhibited lower resistance to new software rollouts and digital transformation projects. This positions CPD as a key change management tool. The research gap is isolating the specific CPD activities that most effectively build resilience and agility against technological disruption.

In Africa, Hassan (2025) investigated the role of CPD in improving ICT-based service delivery among civil servants in Egypt. Using a descriptive research design and structured questionnaires administered to 350 public officials, the study found that employees who consistently participated in CPD programs showed higher competence in managing e-government systems. The authors highlighted that CPD contributed to service consistency and reduced citizen complaints related to digital service delays. Nonetheless, the study's descriptive nature limited causal inference, and it did not analyze how contextual moderators such as infrastructure or organizational support affect CPD outcomes. The authors called for broader analytical studies to establish CPD's long-term impact on e-government performance. This limitation reinforces the relevance of the current study, which employs regression analysis to test these relationships in a Kenyan setting.

A study by Shibambu (2024) in South Africa assessed the impact of CPD on the implementation of digital transformation strategies in provincial government departments. Employing a mixed-methods approach, the research found that structured CPD sessions in data management and cybersecurity significantly enhanced employee readiness for e-government adoption. Findings indicated that departments with higher CPD participation reported improved response times and citizen satisfaction scores. However, the study also revealed disparities in CPD access between urban and rural offices, suggesting uneven program delivery. Shibambu (2024) recommended decentralizing CPD to ensure equitable learning opportunities across government units. The Kenyan context provides an opportunity to test these recommendations by evaluating CPD's effects across Huduma Centres distributed nationwide.

Regionally, Espinosa and Pino (2024) conducted a case study in Estonia, often cited as a global benchmark in e-government. The study examined how continuous training and professional certification programs supported Estonia's digital transformation in public administration. Using a qualitative analysis of policy documents and expert interviews, the research found that sustained CPD was central to developing a highly competent, innovation-oriented public workforce. However, Espinosa and Pino (2024) noted that Estonia's advanced digital maturity might limit generalizability to developing countries facing infrastructural constraints. The study concluded that successful CPD requires institutional commitment and supportive culture—factors that vary significantly in developing contexts. This gap provides a rationale for examining CPD effectiveness under the resource-constrained environment of Kenya's Huduma Centres.

In East Africa, Waweru and Kamau (2023) explored the effects of continuous learning and professional certification on county government service delivery in Uganda and Tanzania. Using a comparative cross-sectional survey, they found that CPD programs incorporating digital literacy and leadership modules enhanced the efficiency and transparency of public service operations. The study revealed that counties that institutionalized annual CPD frameworks performed better in implementing e-government projects. However, it also noted weak monitoring mechanisms and inconsistent budgetary allocations as major barriers to sustainability. The authors recommended integrating CPD into human resource policy and ensuring structured evaluation of outcomes. The current study builds on these insights by assessing CPD's systematic influence on the implementation of digital services within Kenya's Huduma Centres.

In Kenya, [Lagat and Bogongo \(2023\)](#) investigated the role of CPD in enhancing digital service delivery in Huduma Centres using a descriptive correlational design. The study revealed that continuous professional learning improved staff adaptability to new ICT systems, reduced service delays, and increased citizen satisfaction. The findings emphasized that CPD programs focusing on customer service, digital literacy, and change management enhanced overall service quality. However, the authors observed that training was not uniformly implemented across all Huduma Centres and lacked consistent evaluation mechanisms. They recommended a national CPD policy framework to standardize training frequency and content. This study provides the contextual foundation for the present research, which extends analysis to all Huduma Centres while statistically linking CPD and e-government service delivery outcomes.

Similarly, [Mutegi et al. \(2021\)](#) evaluated the contribution of continuous professional learning to the performance of public sector employees in Kenyan Huduma Centres. Using a mixed-

methods approach, they found that CPD led to improved problem-solving ability, innovation, and employee engagement in implementing digital government initiatives. However, the study noted resource limitations, weak follow-up mechanisms, and minimal emphasis on organizational culture in sustaining CPD benefits. While the authors confirmed CPD's importance, they recommended further research using large, representative samples and advanced analytical techniques. The present study addresses this gap by employing regression models and moderation analysis to assess how CPD, supported by organizational culture, influences the implementation of electronic government services in Kenya.

2.3.4 Technological Infrastructure on the Implementation of Electronic government Services.

Utama (2020) examined the influence of technological infrastructure on the implementation of digital government systems in Indonesia using a quantitative survey design targeting 425 public sector ICT officers. The study found that adequate infrastructure—particularly broadband connectivity, server capacity, and reliable software systems—was essential for efficient e-government service delivery. The research showed that agencies with integrated data centers achieved higher efficiency and citizen satisfaction due to reduced service delays. However, the study focused narrowly on infrastructure availability without exploring its interaction with human resource factors or organizational culture. Utama recommended that future research examine how workforce competencies and institutional readiness moderate infrastructure impacts. This study addresses that gap by integrating technological infrastructure with human resource training determinants in the Kenyan Huduma Centre context.

Meiyanti et al. (2021) investigated the relationship between infrastructure readiness and e-government adoption in Malaysia, employing a mixed-methods design involving surveys and key informant interviews. Their results revealed that cloud computing, secure networks, and interoperability frameworks significantly improved the scalability of e-government services. The study found that inadequate ICT maintenance policies often led to system downtime and data losses, reducing service reliability. Despite these insights, Meiyanti et al. noted that the study excluded behavioral and cultural variables that affect how employees utilize existing infrastructure. They recommended incorporating user capacity and institutional context into future infrastructure assessments. This limitation provides justification for the present study's inclusion of both training and cultural moderators in analyzing infrastructure effects in Kenya.

Smith and Johnson (2021) assessed centralized database integration as part of technological infrastructure reforms in the United States' federal government. Using a longitudinal evaluation design, they examined system interoperability across 15 federal agencies and found that consolidated data centers enhanced decision-making efficiency and reduced duplication of citizen records. Their study emphasized that robust technological infrastructure is indispensable for transparency and interagency coordination. Nevertheless, Smith and Johnson highlighted persistent challenges with cybersecurity management and uneven data accessibility between departments. They concluded that strong technical infrastructure must be complemented by consistent employee training and data governance frameworks. These findings inform the current study's focus on how Kenya's Huduma Centres can balance infrastructure investment with human resource capacity to sustain digital service quality.

In Africa, Mohammed et al. (2020) explored the role of technological infrastructure in driving electronic government adoption in Nigeria's federal ministries. Using a descriptive survey of

500 public officials, they found that limited bandwidth, outdated software, and poor data management infrastructure impeded service automation and responsiveness. The study identified a strong positive relationship between infrastructure adequacy and citizen trust in digital platforms. However, it did not account for contextual moderating factors such as training adequacy and organizational culture, which might explain varying adoption rates across departments. The authors recommended developing integrated training-infrastructure frameworks to enhance implementation. This recommendation strengthens the rationale for the current study, which empirically tests these relationships within Kenya's Huduma Centres.

Apleni and Smuts (2020) conducted an evaluative study in South Africa focusing on how ICT infrastructure investment affects e-government service delivery performance in provincial departments. Using a mixed-methods approach combining document analysis and staff surveys, the study found that inadequate technological infrastructure constrained digital communication, record management, and data sharing among departments. They observed that infrastructure improvements led to significant reductions in service turnaround time and increased citizen satisfaction levels. However, the study's findings were limited by the absence of longitudinal data to assess sustainability over time. Apleni and Smuts recommended regular infrastructure audits and integration of continuous professional training for ICT personnel. The present study builds on this by analyzing the concurrent role of technological infrastructure and human resource training in sustaining digital service delivery in Kenya.

A World Bank (2023) assessment of service centers identified unreliable internet connectivity as the primary bottleneck for e-service delivery. Centers with sub-95% uptime saw citizen satisfaction scores drop by over 30 points, as queues formed and transactions failed. This

directly links infrastructure reliability to public trust. The research gap involves conducting cost-benefit analyses of resilient solutions like satellite backups to provide a business case for infrastructure investment in remote locations.

A study by the Indian Institute of Technology (2024) on national data interoperability found that legacy systems unable to communicate created significant delays. The implementation of a centralized API gateway, a key infrastructure piece, reduced data retrieval times from hours to seconds. This proves that backend infrastructure is as crucial as frontline hardware. The research gap is addressing the governance and political challenges of mandating data sharing across historically siloed government departments.

Research from Ghana by Kwame and Yoshida (2022) demonstrated that outdated end-user hardware directly cripples software efficiency. They found that computers over four years old negated 70% of the performance benefits of a new software platform, as processing lag frustrated staff and citizens. This highlights the need for regular hardware refresh cycles. The research gap is creating predictive models to optimize replacement schedules, balancing budgetary constraints with service standards.

A case study on Estonia's e-government, published by the MIT Sloan School (2023), credited its success to a foundational, state-wide digital identity infrastructure. This shared technological asset allowed every new e-service to be built on a secure and standardized authentication layer, dramatically accelerating rollout. The research gap for other nations is planning the long-term, phased migration from disparate, legacy identity systems towards such a unified, national digital infrastructure.

A report by the African Union (2021) on cybersecurity highlighted that a major data breach in a South African agency eroded public trust and caused a 15% decline in e-filing usage. The study concluded that visible investment in security infrastructure is essential for maintaining citizen confidence in digital services. The research gap is linking specific security investments to the prevention of real-world incidents, moving beyond perception to measurable outcomes.

A study by Alvarez and Petrova (2024) on cloud migration in the Colombian government found that moving services from on premise servers to the cloud reduced system deployment time for new e-services by 90% and provided seamless scaling during peak demand. This underscores cloud infrastructure's role in fostering agility. The research gap involves addressing the unique challenges of cloud adoption for governments with strict data sovereignty laws.

In East Africa, Panthee and Sharma (2020) investigated ICT infrastructure readiness in public sector digital transformation across Uganda and Tanzania. Employing a comparative cross-sectional design, the study revealed that robust infrastructure, comprising stable power supply, broadband networks, and secure data systems, was fundamental for e-government success. Findings demonstrated that countries with national ICT frameworks achieved higher levels of digital inclusion and service automation. Nonetheless, the authors noted disparities between urban and rural areas, resulting in unequal citizen access to e-government platforms. The study recommended that future research assess how infrastructural adequacy interacts with human factors such as staff training and technological competence. This provides a foundation for the Kenyan analysis, where similar disparities exist between counties hosting Huduma Centres.

In Kenya, Napitupulu et al. (2020) evaluated the relationship between ICT infrastructure adequacy and the effectiveness of Huduma Centres using a descriptive correlational design. The study revealed that centres equipped with modern servers, stable internet connectivity, and secure systems recorded faster processing times and higher customer satisfaction. It also noted that inadequate ICT facilities in rural centres limited service accessibility and efficiency. However, the authors did not assess how staff capacity or organizational culture moderated infrastructure outcomes. They recommended strengthening ICT maintenance policies and aligning training with infrastructure upgrades. The current study extends this work by including moderating contextual factors in analyzing infrastructure impacts on e-government service delivery in Huduma Centres.

Similarly, Lee and Kim (2020) assessed technological infrastructure integration and inter-ministerial data sharing in Kenya's digital transformation initiatives. Using case study analysis and expert interviews from the ICT Authority, they found that network interoperability and centralized platforms enhanced transparency and coordination. The study reported significant gains in data-driven decision-making but highlighted limitations in technical training and cultural alignment across ministries. Lee and Kim recommended embedding infrastructure upgrades within comprehensive workforce development strategies to ensure sustainability. Their findings underscore the interdependence between infrastructure and human capital—an interrelation central to the present study's framework on Huduma Centre service delivery.

2.3.5 Organizational Culture on the Relationship between Human Resource Training determinants and Implementation of Electronic government Services

Ariana et al. (2020) examined the influence of organizational culture on digital transformation and service innovation within the public sector in Singapore. Using a qualitative case study design supported by document analysis, the researchers explored how values of innovation, efficiency, and collaboration shaped employee behavior and technology adoption. Findings revealed that a culture emphasizing innovation and collective learning enabled Singapore's Smart Nation program to achieve rapid digital integration across government agencies. The study concluded that supportive organizational culture was essential for embedding human resource training outcomes into routine public service operations. However, the authors noted that their single-country focus limited generalizability to developing nations with resource constraints. This study provides a global benchmark underscoring the need to evaluate how cultural alignment moderates training and implementation outcomes in Kenya's Huduma Centres.

Espinosa and Pino (2024) conducted a case study in Estonia analyzing the interplay between organizational culture and the implementation of e-government systems. Drawing on interviews with ICT managers and civil servants, the study found that Estonia's culture of transparency, accountability, and citizen trust significantly enhanced the integration of digital systems such as the X-Road platform. The research revealed that continuous professional training aligned with cultural values reinforced employee ownership of e-government projects. Nonetheless, the study did not quantitatively test how culture moderates the relationship between training determinants and service performance. Espinosa and Pino (2024) recommended replication in countries with differing administrative traditions and

technological maturity. The current study builds on these recommendations by statistically testing culture's moderating role in Kenya's evolving digital governance environment.

Batara et al. (2020) explored the role of organizational culture in fostering innovation and adaptability among public employees during e-government implementation in South Korea. Using a mixed-methods approach combining employee surveys and focus group discussions, they found that cultures supporting experimentation and risk-taking increased employee engagement in technological innovation. The study emphasized that a punitive culture hindered creativity, limiting the translation of training into practical innovation. However, the authors noted that they did not assess how specific training methods interact with organizational values to influence outcomes. They proposed further research linking cultural orientation to human resource training determinants. This gap directly aligns with the current study's objective of assessing organizational culture as a moderator between training variables and e-government implementation.

In Africa, Mungai and Gathungu (2020) examined organizational culture's impact on the effectiveness of e-government implementation in South Africa's Department of Public Service and Administration. Employing a cross-sectional survey, they found that an adaptive and participatory culture enhanced digital service innovation and the integration of training outcomes into practice. The study reported that hierarchical and bureaucratic cultures often discouraged continuous learning, slowing technology adoption. Although insightful, the research was limited to qualitative perceptions and did not incorporate quantitative measures of training determinants. Mungai and Gathungu recommended future studies test culture's mediating or moderating role statistically. This provides a strong empirical basis for the current Kenyan study, which uses inferential analysis to examine culture's moderation effects.

Riyadh et al. (2020) conducted a study in Egypt to explore the influence of organizational culture on public employees' responsiveness to digital transformation training programs. Using structural equation modeling, they discovered that a supportive culture of openness and teamwork amplified the positive effects of ICT training on performance and service delivery. The study also found that rigid bureaucratic norms hindered innovation and slowed the adoption of new technologies. However, the research did not extend its analysis to multi-level governance structures or decentralized service units. The authors recommended replication in public service models where decentralization and cultural diversity exist. This recommendation supports the rationale for investigating the moderating effect of culture in Kenya's multi-county Huduma Centre framework.

In East Africa, Kumajas (2021) analyzed the relationship between cultural adaptability and technological implementation within public agencies in Uganda. Using a descriptive survey design, the study established that a culture promoting learning, flexibility, and collaboration significantly improved the utilization of e-government systems following employee training. The findings highlighted that adaptability and participative management styles reinforced the long-term retention of training outcomes. However, Kumajas did not explore the extent to which culture moderates specific training determinants such as frequency or method. The study recommended integrating culture-based metrics into future training evaluation frameworks. The current research addresses this gap by examining how cultural adaptability moderates the relationship between training determinants and implementation outcomes in Kenya.

Hwang and Choi (2020) examined cultural communication and collaboration in the context of cross-ministry digital service delivery in Tanzania. Employing focus group interviews and

departmental surveys, they found that open communication channels and team-oriented cultures facilitated knowledge sharing and reduced duplication of digital projects. The study emphasized that collaborative cultures enhanced the translation of human resource training into operational practice. Nonetheless, the research was limited to qualitative findings and did not empirically test the strength of these relationships. Hwang and Choi suggested conducting quantitative analyses incorporating training and culture variables together. This provides conceptual direction for the current Kenyan study, which operationalizes culture as a moderator in training-performance relationships.

In Kenya, Akoyo and Muathe (2020) assessed the moderating influence of organizational culture on training effectiveness and employee performance in the public service sector. Using a correlational research design with 210 respondents across ministries, they found that participatory and learning-oriented cultures strengthened the relationship between training and employee output. The study established that culture acted as a catalyst for embedding learned skills into practice. However, the analysis was limited to general performance metrics and did not focus on electronic government implementation. Akoyo and Muathe recommended extending the model to digital transformation contexts. This current study responds directly to that call by examining culture's moderating role in e-government service delivery within Huduma Centres.

Matenjwa (2020) investigated organizational culture's role in supporting continuous learning and digital service improvement at Huduma Centres in Kenya. Using a descriptive survey and regression analysis, they found that centres with a strong learning culture and participative leadership achieved higher efficiency and citizen satisfaction. Their findings emphasized that open communication and shared values improved the implementation of electronic

government systems. Nonetheless, the study focused primarily on culture's direct effects and did not analyze its moderating role in training-outcome relationships. The authors recommended examining how culture interacts with training determinants such as methods and frequency to enhance service delivery. The current research fulfills this recommendation by testing culture's moderating influence across all Huduma Centres nationwide..

2.3.6 Implementation of Electronic government Services

Electronic government, often referred to as digital government, involves the application of information and communication technologies (ICT), including IT and web-based tools, to enhance the efficiency and effectiveness of public sector service delivery. It represents the use of the internet and other digital platforms by governments to deliver services to citizens (Islam et al. 2024). In essence, e-government entails the computerization of both administrative and public-facing aspects of government operations, introducing technological innovations that streamline internal processes and improve service accessibility (Morris, 2020). This includes online transactions, automation of office functions, and the utilization of digital tools to modernize public service delivery. Open government data initiatives further strengthen transparency, accountability, and responsiveness, while simultaneously minimizing bureaucratic inefficiencies and improving operational performance (Ames et al., 2020).

The adoption of technology within government institutions can be analyzed at two levels: organizational and individual (Asenahabi, 2020). Organizational adoption examines how entities such as agencies, ministries, and departments make decisions to integrate new technologies, while individual adoption focuses on a person's intention and behavior toward using such innovations (Chohan & Hu, 2022). According to Hall and Khan (2022),

technological innovations can only yield positive outcomes for organizational performance when they are broadly accepted and effectively utilized. Understanding the decision-making processes that influence both organizational and individual adoption is therefore essential for managing technological change (Gill, 2020). Successful implementation of e-government requires not only a clear governmental vision but also acceptance and engagement from intended users. Harris (2020) notes that exposure to ICT and the ability to adopt and utilize digital tools are critical determinants of adoption in South Africa. In developing countries, income disparities and limited access to computers and the internet continue to affect ICT adoption rates.

The implementation of e-government involves significant transformations within the public sector's organizational structures, cultural norms, and administrative processes. Assoratgoon et al. (2023) emphasize that human, cultural, political, and technological factors must be addressed for successful adoption, as these changes influence both institutional behavior and individual attitudes. E-government thus brings transformative shifts in public sector culture, operations, and service orientation (Kazdin, 2021).

Globally, there is no single model of e-government implementation that fits all national contexts. Governments have adopted varying approaches from basic websites providing one-way or two-way communication to advanced integrated portals supporting online transactions (Khatri, 2020). While there is broad consensus on developmental phases such as publishing, transactional, and integration stages, Apleni and Smuts (2020) suggest that organizational and technological perspectives differ throughout the e-government life cycle. This highlights the need for context-specific strategies that align digital transformation efforts with a country's institutional capacity, socio-economic conditions, and technological readiness.

2.3.6 Research Gaps

Existing global empirical studies have largely established that appropriate training methods—such as simulation, blended learning, and on-the-job coaching—are essential in improving employee competence and digital service performance (Mizrak & Caylan ,2023;Wang et al., 2022). However, most of these studies were conducted in developed nations like China, the United States, and Australia, where institutional capacity and digital literacy levels differ significantly from those in developing economies. While they confirm that interactive and practical learning enhances e-government adoption, they overlook contextual moderators such as organizational culture and infrastructure that could influence method effectiveness. In Africa, studies by Chirambo (2023) revealed that training improved service delivery but failed to control for cross-departmental variations or to test method-specific impacts using inferential analysis. In Kenya, studies such as Mutegi et al. (2021) and Achieng et al. (2021) linked training to improved service quality but were descriptive and confined to selected Huduma Centres. Therefore, the existing body of knowledge lacks a comprehensive, national-level empirical analysis that quantifies how specific training methods influence electronic government service delivery while accounting for cultural and infrastructural moderators—an evidence gap the current study seeks to fill.

Globally, research has shown that frequent training enhances staff competency, reduces resistance to change, and promotes better adaptation to technological advancements (Cantu-Ortiz et al. 2020). Nevertheless, these studies were largely situated in developed countries with well-established e-government systems and did not examine how contextual or institutional factors shape the outcomes of frequent training. In Africa, investigations by Chirambo (2023) confirmed that consistent training improved employee performance but

failed to incorporate moderating factors such as organizational culture or to assess the sustainability of learning outcomes. Similarly, East African research by Waweru and Kamau (2023) found that frequent training led to improved service reliability but was limited by cross-sectional designs and reliance on self-reported measures. In Kenya, Mutegi et al. (2021) and Achieng et al. (2021) demonstrated that irregular training schedules caused disparities in service quality among Huduma Centres, yet their studies lacked rigorous statistical analysis or examination of contextual factors. This leaves a clear empirical gap regarding how training frequency interacts with organizational culture and technological infrastructure to influence e-government implementation, which the current study addresses through a mixed-method, multi-centre design.

Empirical studies worldwide consistently affirm that continuous professional development fosters digital competence, innovation, and adaptability among government employees (Wang et al., 2023; Shibambu (2024) However, these studies often concentrate on technical training outcomes without linking CPD to measurable service delivery indicators such as efficiency, turnaround time, or citizen satisfaction. In Africa, research by Shibambu (2024) demonstrated positive CPD effects on employee performance but lacked robust analytical models to establish causal relationships or to test for moderating contextual factors. In East Africa, Waweru and Kamau (2023) identified improved service efficiency from CPD participation but reported inadequate monitoring frameworks and inconsistent program funding. Kenyan studies by Matenjwa (2020) and Mutegi et al. (2021) confirmed CPD's importance but were confined to descriptive designs, small samples, and limited geographic coverage. Consequently, there remains insufficient empirical evidence on how CPD contributes to e-government implementation outcomes under varying organizational cultures and

infrastructural capacities. The current study bridges this gap by employing inferential analysis to test the direct and moderating effects of CPD on digital service delivery performance in Huduma Centres.

Although numerous global studies, such as those by Utama (2020) and Meiyanti et al. (2021), underscore that robust technological infrastructure forms the backbone of successful e-government systems, they primarily assess physical and software readiness while neglecting the human resource and cultural dimensions that determine effective utilization. In the African context, Mohammed et al. (2020) and Apleni and Smuts (2020) revealed that infrastructure inadequacies undermine e-government adoption but failed to analyze how training or organizational culture mediates these effects. Similarly, East African studies by Panthee and Sharma (2020) highlighted infrastructural disparities between urban and rural areas but overlooked the interaction between staff competence and technology availability. In Kenya, Napitupulu et al. (2020) and Lee and Kim (2020) found that improved ICT infrastructure enhanced service efficiency in Huduma Centres but did not empirically test the joint influence of infrastructure and training on implementation outcomes. The gap therefore lies in the absence of integrated models that assess how infrastructure, training, and organizational culture collectively shape e-government service delivery—a gap that this study addresses using a multi-variable regression framework.

Globally, scholars such as Ariana et al. (2020) and Espinosa and Pino (2024) have established that supportive and innovative cultures facilitate digital transformation by aligning employee behavior with organizational goals. Nonetheless, these studies have predominantly been qualitative and confined to high-income contexts such as Singapore and Estonia, where institutional maturity is advanced. In Africa, research by Mungai and Gathungu (2020) and

Riyadh et al. (2020) acknowledged that adaptive and participatory cultures enhance e-government performance, yet they failed to empirically examine culture's moderating role between training and service delivery outcomes. Regionally, Kumajas (2021) and Hwang and Choi (2020) demonstrated that open and collaborative cultures promote the transfer of training into practice but relied on self-reported perceptions rather than quantitative moderation testing. In Kenya, Akoyo and Muathe (2020) and Matenjwa (2020) confirmed that organizational culture strengthens the relationship between training and employee performance but limited their analysis to direct effects within single ministries. Thus, empirical studies have not sufficiently analyzed culture's moderating influence across multiple training determinants within decentralized public service systems. The present study fills this gap by statistically testing the moderating role of organizational culture on the relationship between human resource training determinants and e-government implementation across all Huduma Centres.

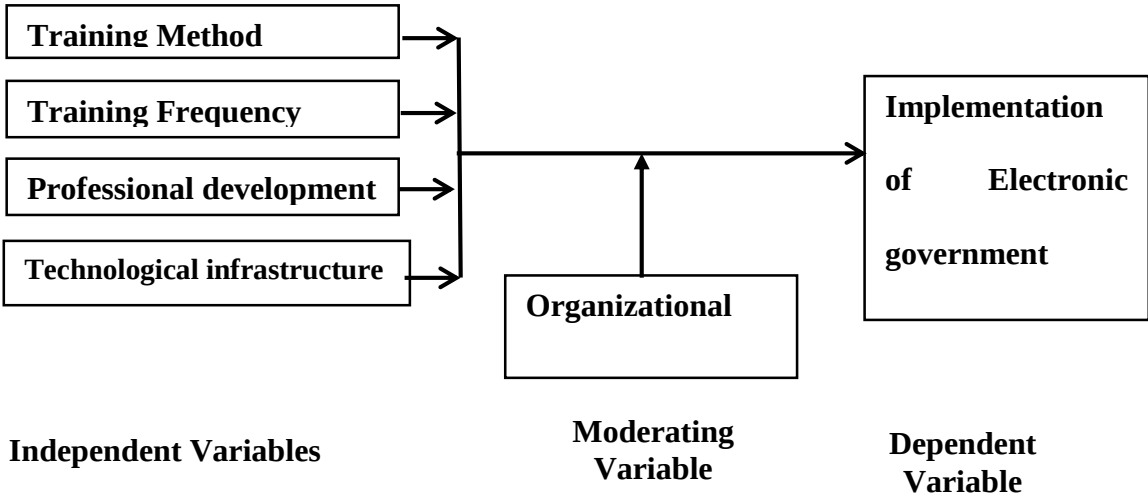
2.4 Conceptual Framework

According to Thadani and Todaro (2020), a concept represents an abstract or generalized idea that emerges from specific experiences or phenomena. Al Hadwer et al. (2021) further explain that understanding an idea does not necessarily require debate, as concepts are derived through observation and reasoning. Fuertes et al. (2020) describe a conceptual framework as a structured approach that organizes empirical observations into a coherent and logical model. Similarly, Al Hadwer et al. (2021) define a conceptual framework as a set of broad ideas and principles drawn from various disciplines to support the presentation and interpretation of research findings. When clearly articulated, a conceptual framework guides researchers in identifying relevant relationships among variables and predicting potential outcomes.

Wolf and De Groot (2020) emphasize that a conceptual framework should be incorporated into research to facilitate analysis, testing, and evaluation, while also allowing for modification as the study progresses to capture possible variations between variables. Lohr (2021) highlights the importance of a conceptual framework in integrating philosophical, methodological, and practical dimensions of a study, thereby strengthening the research’s theoretical grounding. It also supports scholarly discourse by situating the research within a broader academic context. According to Wolf and De Groot (2020), a conceptual framework may also be visually represented through a diagram illustrating the relationships between independent and dependent variables, as shown in Figure 2.2.

Figure 2. 1:

Conceptual framework

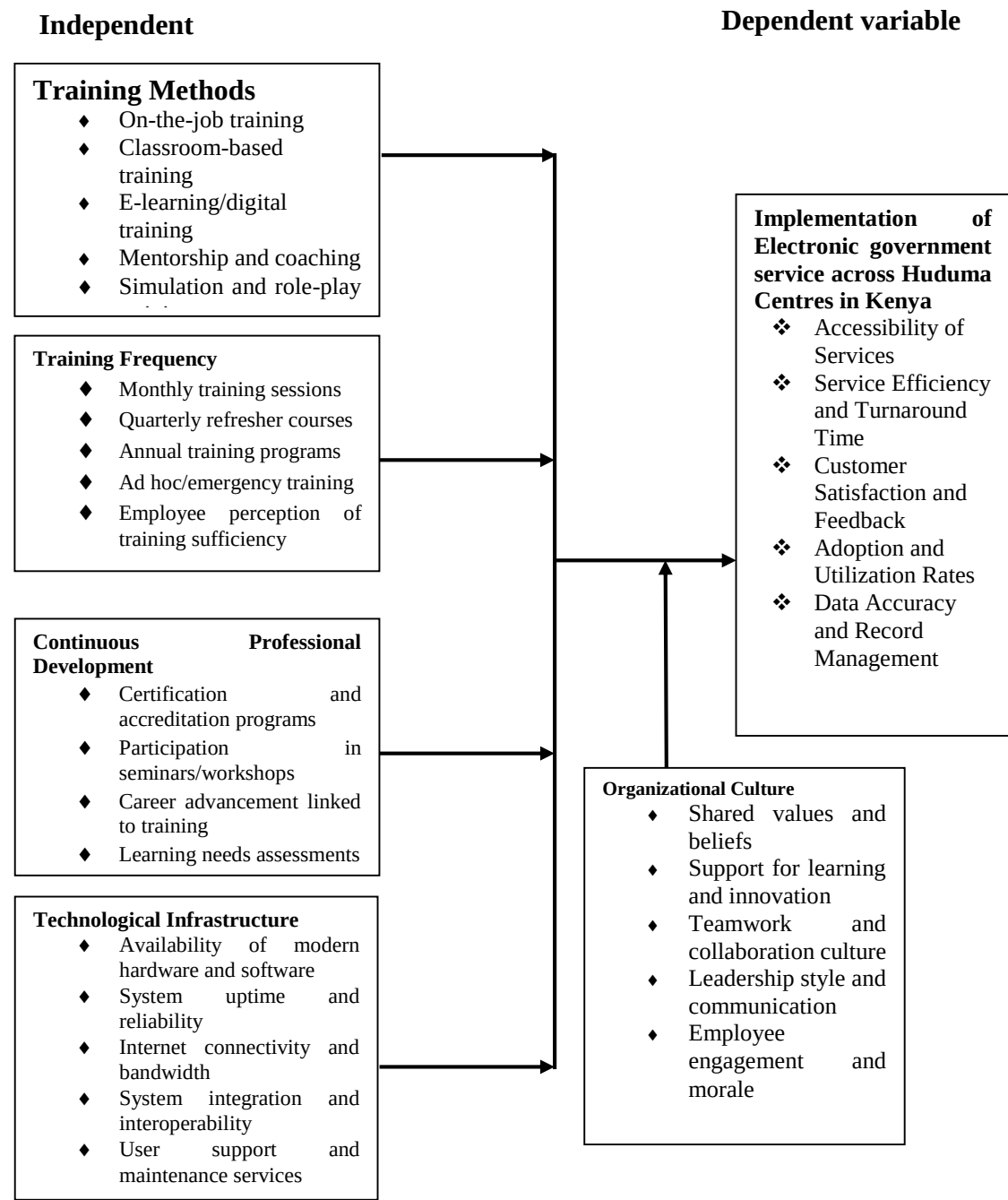


Source: Researcher 2024

2.5 Operational Framework

Figure 2. 2:

Operational Framework



Source: Researcher 2024

Moderating Variable

2.5.1 Human Resource Training Methods (HRTM)

Blended Learning combines online and in-person training to create a flexible learning environment, where employees have the chance to learn both at their own pace and through face-to-face interaction. This method has been shown to improve retention and the application of learned concepts, especially in the context of electronic government services, where practical knowledge is crucial .

Hands-on training involves practical, on-the-job experiences where employees engage with electronic government tools and systems directly. This type of training is essential in ensuring employees are not only familiar with the technical components but also comfortable using these tools in real-world situations. Hands-on training has been associated with higher confidence levels and more effective application of newly acquired skills. In the context of Huduma Centres, this would ensure that employees are not just theoretically aware of electronic government tools but capable of using them to deliver services to the public.

Instructor-led Training (ILT) offers real-time interaction with experts and peers, allowing for immediate clarification of doubts. ILT has been shown to improve understanding and retention of material (Rodríguez & García, 2020). In the implementation of electronic government services, this training method can help employees grasp complex technologies quickly, particularly those that are new or unfamiliar, ensuring a smoother implementation process across Huduma Centres.

Electronic learning, or digital learning, offers a self-paced approach, where employees can access training materials online. This method is highly scalable, allowing for mass training without the logistical constraints of in-person sessions. e-learning is particularly useful in the

context of electronic government services, where employees may need frequent updates on new software or policies. By providing a flexible, accessible training platform, e-learning ensures that employees stay up-to-date with the latest changes in electronic government tools.

2.5.2 Human Resource Training Frequency (HRTF)

Training Interval refers to the frequency with which training sessions are scheduled. Regular intervals, such as weekly or monthly training, can significantly impact an employee's ability to retain and apply new knowledge. Research has shown that frequent training helps reinforce learning and improves employee performance, especially in dynamic environments like electronic government services, where technology evolves quickly (Alvarez & Gupta, 2022). In Huduma Centres, frequent training ensures that employees remain proficient and confident in using electronic government systems.

Refresher Courses are periodic training sessions designed to revisit and update employees on key knowledge areas. These courses are crucial in environments where technology is continuously evolving. Studies suggest that regular refresher courses help employees stay current with technological advancements and operational changes, which are particularly important in electronic government service delivery. This ongoing reinforcement ensures that the implementation of electronic government services remains effective and efficient.

Frequency of Updates refers to how often employees are exposed to new updates or changes in the software and tools they use. In the context of electronic government services, this could mean updates on new functionalities, security patches, or regulatory changes. Frequent updates ensure employees are not left behind, maintaining the continuity and reliability of

services delivered to the public (Sabater, 2024). As electronic government systems evolve, it is essential for employees to stay informed and prepared for any changes.

Training cycle duration describes the overall length of time for which training takes place. A well-structured training cycle, whether it is spread over a few weeks or months, ensures that employees have adequate time to absorb and apply new concepts. Longer training cycles can offer a more comprehensive understanding of complex systems, thereby improving the effectiveness of electronic government service delivery (Feeley, 2024). Frequent cycles of training ensure that employees' knowledge is consistently updated and refined.

2.5.3 Continuous Professional Development (CPD)

Skill enhancement through continuous professional development (CPD) is essential for keeping employees' abilities in line with technological advancements. CPD offers targeted opportunities for employees to develop both technical and soft skills, ensuring they can effectively manage and implement electronic government services (Magwenya et al., 2023). In Huduma Centres, CPD initiatives could involve specialized training in new electronic government tools, enhancing employees' ability to meet evolving demands in service delivery.

Certifications and qualifications are formal recognition of an employee's skills and expertise. CPD can facilitate access to certifications that enhance professional credibility and increase an employee's competence in electronic government services. Certification programs in technology management or e-governance have been linked to increased job satisfaction and improved service delivery (Mizrak & Caylan (2023). These certifications ensure that

employees have the necessary qualifications to execute electronic government services effectively.

Career Progression is a significant motivator within CPD frameworks. As employees engage in CPD, they enhance their qualifications and are better positioned for career growth. This can directly affect the implementation of electronic government services, as motivated and upwardly mobile employees are more likely to take initiative and drive improvements in service delivery (Frendo, 2023). Continuous learning through CPD fosters a sense of achievement and professional growth, which translates into enhanced productivity.

Knowledge Sharing within CPD frameworks enables employees to exchange insights and experiences with peers. This sharing of knowledge fosters collaboration and improves the collective capability of staff at Huduma Centres to handle electronic government tools effectively. It also ensures that best practices are disseminated across the workforce, leading to a more uniform and efficient service delivery model (Ouma & Maende, 2024)

2.5.4 Technology Infrastructure Maintenance

Software availability plays a critical role in the implementation of electronic government services. The reliability and accessibility of the software used for service delivery directly influence how employees interact with systems and how effectively they can serve citizens. Research has shown that reliable and user-friendly software is key to ensuring seamless service delivery in electronic government environments (Kumar & Singhal, 2020). Huduma Centres need to ensure that employees are working with up-to-date and efficient software platforms to improve service quality.

Hardware resources are just as important as software in the context of electronic government services. Adequate hardware resources, including computers, servers, and peripheral devices, ensure that employees can access and use electronic government platforms effectively. Studies show that inadequate hardware can lead to slow processes, which in turn affects the quality of service provided to citizens (Smith & Roberts, 2020). The availability of up-to-date hardware is essential for supporting the full range of electronic government applications.

Network Connectivity is essential for accessing online services and ensuring that employees can perform tasks efficiently. Poor or inconsistent internet connectivity can lead to delays, errors, and dissatisfaction among both employees and citizens. In Kenya, improving network infrastructure in Huduma Centres is crucial for the successful implementation of electronic government services (Mizrak & Caylan (2023). Robust and reliable internet access is a foundational requirement for effective electronic government service delivery.

System Security is a key concern in the digitalization of government services. The protection of sensitive citizen data and the security of electronic government systems are crucial for maintaining trust and preventing cybercrime. Studies indicate that lack of system security can result in breaches that undermine the integrity of electronic government services (Singh et al., 2025). Ensuring a secure technological infrastructure in Huduma Centres is paramount to safeguarding public trust and enhancing service delivery.

2.5.5 Organizational Culture

Leadership Support is a fundamental element of organizational culture. Effective leaders create an environment that encourages learning, supports human resource development, and promotes a culture of continuous improvement. Research indicates that organizations with

strong leadership tend to implement more effective training programs, as leaders inspire and motivate employees to participate actively and apply newly acquired skills in their work (Tadesse Bogale & Debela 2024). Within Huduma Centres, leadership support for training initiatives plays a pivotal role in ensuring the successful implementation of electronic government services.

Employee Motivation is another key factor influenced by organizational culture and is essential for the success of e-government initiatives. Motivated employees are more likely to embrace technological change and apply new methods introduced through training (Abhari, 2025). A culture that nurtures motivation encourages employees to take responsibility for their professional growth and to utilize their training to enhance service delivery.

Collaboration and Teamwork are also integral to effective organizational culture, particularly during the adoption of new technologies. A collaborative work environment enables employees to share knowledge, exchange ideas, and collectively solve challenges. In the context of Huduma Centres, teamwork enhances the implementation of e-government services by fostering mutual support and collective problem-solving (Zhang et al., 2025). Change Management is crucial for helping employees adapt to new systems and procedures. An organizational culture that supports effective change management facilitates smoother transitions, reduces resistance, and improves the overall success of e-government service implementation (Hasan et al., 2025).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter detailed the steps taken to achieve the objectives of the study. It presented the research methodology and empirical strategies employed, along with the underlying philosophical assumptions that informed the investigation. Key components discussed include the research design, philosophical framework, target population, sampling methods and frame, demographic profile of participants, data collection tools, variable measurement techniques, pilot testing, and procedures for data gathering and analysis. Additionally, the chapter addressed the boundaries and constraints associated with the chosen methodological approach.

3.2 Research Philosophy

Dougherty et al. (2020) characterized research philosophy as a perspective on how information regarding a phenomenon should be gathered, assessed, and utilized. Similarly, Kirongo and Odooyo (2020) viewed it as the approach to collecting and interpreting data related to a specific subject. This study adopted a positivist research philosophy, guided by the understanding that while interpretivism emphasizes the subjective interpretation of reality, positivism is grounded in observable facts and objective analysis, excluding personal perceptions or abstract concepts (Khatri, 2020).

3.2.1 Research Design

The research employed an explanatory cross-sectional design to explore the factors influencing human resource training and the contextual elements that moderate its impact

on the rollout of electronic government services within Huduma Centres in Kenya. This design is suited for examining cause-and-effect relationships among variables at a single point in time, without altering the natural setting of the study. As noted by Creswell and Creswell (2022), explanatory designs are useful when the goal is to assess how changes in independent variables contribute to variations in a dependent variable.

This approach was well-suited for the study, as it aimed to uncover the causal links between independent variables—such as training strategies, frequency, ongoing professional development, and technological support—and the dependent variable, which is the implementation of e-government services. The cross-sectional nature of the design facilitated data collection from multiple centres simultaneously, enabling the identification of trends and correlations without experimental manipulation. Comparable methodologies have been applied in prior research on digital government initiatives (Wang et al., 2023; Mutegi et al., 2021). Furthermore, the use of both quantitative tools (questionnaires) and qualitative methods (key informant interviews) enriched the analysis, allowing for triangulation and enhancing the reliability and depth of the findings.

3.3 Target Population

The concept of a target population refers to the group of entities or units from which data is drawn for analysis. Ackerman et al. (2021), as cited by Stratton (2021), describe a population as the entire set of individuals, cases, or items that share identifiable characteristics. In this research, the target population encompassed all 52 Huduma Centres located throughout Kenya. These centres serve as centralized hubs for delivering a variety

of government services. Each centre operates under a structured management system comprising top-level, middle-level, and operational managers.

Although data were collected from individual managers, the Huduma Centre itself was considered the primary unit of analysis. Managers acted as informants, supplying data that reflected the operations and strategic dynamics of their respective centres, rather than being the direct subjects of analysis. To ensure a robust and representative dataset, the study gathered responses from 416 managers across all centres—specifically, one top manager per centre (52), two middle managers per centre (104), and three operational managers per centre (156).

A census approach was employed to include all 52 Huduma Centres, rather than selecting a sample. This strategy was appropriate due to the relatively small and manageable population size, as well as the distinct operational features of each centre, which required full inclusion to capture contextual variations in e-government service implementation. Within each centre, purposive sampling was used to identify key informants, such as top-level managers and ICT officers, who were best positioned to provide insights into training practices and implementation processes.

Table 3. 1:*Target Population*

Managerial Level	Number of Managers per Centre	Number of Centres	Total Number of Managers
Top Managers	1	52	52
Middle Managers	2	52	104
Operational Managers	5	52	260
Total		52	416

Source: Kenya National Bureau of Statistics [KNBS], (2023)

The study focused on a target population of 416 managers selected from 52 Huduma Centres located throughout Kenya. This group included 52 top-level managers, 104 middle-level managers, and 260 operational-level managers, as outlined in Table 3.1 (KNBS, 2023).

3.5 Sampling frame

In conducting the analysis, it was essential to identify and accurately compile the sampling frame, which refers to the complete list or structure from which a sample is drawn (Westreich, 2019). Ames et al. (2020) describe a sampling frame as a publicly available list or a defined set of criteria used to delineate the population under study. Berndt (2020) views it as the group from which sample participants are selected, while Northstone et al. (2020) define it as a mechanism or tool that generates a comprehensive list of all units such as individuals, organizations, or items within the population of interest.

An effective sampling frame includes detailed attributes such as geographic identifiers, contact details, unique codes, and other systematically organized information that ensures

accurate representation of the population. It also excludes any elements that do not meet the inclusion criteria for the study (Chen et al., 2020). According to Lohr (2021), the sampling frame helps define the sampling unit, which is the basic element or group of elements selected for analysis. These units can range from individuals to objects like animals, plants, or manufactured goods.

For this study, the sampling frame consisted of a complete list of the 52 Huduma Centres operating across Kenya. From this frame, a total of 312 respondents were selected, representing various managerial levels within these centres. This approach ensured that the data collected reflected a broad and accurate cross-section of the target population.

3.6 Sampling Technique and Sample Size

Sampling involves selecting a portion of a population that accurately reflects the characteristics of the whole, allowing researchers to draw meaningful conclusions without studying every individual. It is the process by which specific individuals, locations, or items are chosen for investigation (Gill, 2020). A sample is essentially a subset of the population, carefully chosen to represent the broader group and support valid inferences (Lakens, 2022). Harris (2020) notes that samples are drawn from defined segments of the population to provide insights into the larger group.

Determining the appropriate sample size is crucial, as it balances the need for reliable data with practical constraints. A sample that is too small may lack the statistical power to produce useful findings, while an excessively large sample may lead to unnecessary expenditure of time and resources (Kirongo & Odoyo, 2020). Stratton (2021) describes sampling as gathering data from a limited portion of the population to represent the whole.

In this study, all senior managers were included to ensure strategic perspectives were captured. Additionally, 50% of middle managers and 33% of junior managers from each Huduma Centre were randomly selected. This stratified random sampling approach allowed for a balanced representation across different management levels and geographic locations. Ultimately, a total of 156 respondents were selected, providing a diverse and comprehensive dataset for analyzing the impact of human resource training on the implementation of electronic government services.

To demonstrate sampling rigor, a Yamane (1967) sample size determination formula **was** applied as follows: $n = N / 1 + N(e)^2$

where n is the sample size, N is the population size (52 Huduma Centres), and e is the margin of error (0.05). Substituting these values gives:

$$n = 52 / 1 + 52(0.05)^2$$

$$= 52 / 1.13 = 46$$

Although statistical validity could be achieved by including at least 46 Huduma Centres, the study opted to incorporate all 52 centres to strengthen the reliability and representativeness of the findings. This comprehensive inclusion ensured that diverse operational contexts were captured across the country. To determine the appropriate sample size (n), Yamane's formula (1967) was applied, which provides a simplified method for calculating sample size based on a known population and a desired margin of error.:

$$n = 416 / 1 + 416(0.05)^2$$

$$n = 1 + 416(0.05)^2$$

$$n=4161+416(0.0025)$$

$$n=203.92$$

Therefore, using Yamane's formula at a 95% confidence level and a 5% margin of error, the sample size for a population of 416 managers is 204 respondents (Yamane, 1967).

Table 3. 2:

Sample Size

Managerial Level	Population (N_i)	Proportion	Sample Size (n_i)
Top Managers	52	12.5	26
Middle Managers	104	25	51
Operational Managers	260	62.5	127
Total	416	100.0	204

To ensure balanced representation across different levels of management, the sample of 204 managers was allocated proportionally: 26 top-level managers, 51 middle-level managers, and 127 operational-level managers. This proportional distribution mirrored the composition of the overall target population, thereby enhancing the sample's representativeness and minimizing the risk of sampling bias, in line with the principles outlined by Yamane (1967).

3.7 Data Collection Procedures

To support the data collection process, the study was backed by an official introductory letter from the University and a research permit issued by the National Commission for Science, Technology and Innovation. Data collection was conducted using a structured

questionnaire comprising both open-ended and closed-ended items. These questionnaires were distributed and retrieved through a drop-and-pick method, ensuring convenience for respondents and efficient management of responses.

The quantitative portion of the questionnaire featured nominal scales and Likert-type scales. The Likert scale was chosen for its clarity, ease of use, and its capacity to generate interval-level data suitable for advanced statistical techniques such as correlation analysis, factor analysis, and regression modeling (Stratton, 2021). This approach enabled a more rigorous examination of the study variables.

To maintain accurate records and monitor the flow of questionnaires, a tracking register was used to log all distributed and returned forms. Data collection also involved face-to-face interviews conducted by trained research assistants to complement the questionnaire responses. In addition to gathering primary data, the study incorporated secondary sources such as published reports, scholarly articles, and other academic literature to enrich the analysis.

3.8 Pilot Study

A pilot study was carried out to uncover any potential flaws in the research design and data collection instruments, as well as to gather initial insights that could guide improvements to the overall methodology (Vabalas et al., 2020). This preliminary phase was essential for verifying the clarity, relevance, and functionality of the research tools prior to launching the main study. Following the recommendation by Harris (2020), the pilot involved 10% of the intended sample size—a proportion widely regarded as sufficient for evaluating research instruments without affecting the integrity of the primary sample.

In this study, the pilot was conducted among 10% of the senior managers stationed at Huduma Centres in Kiambu County. These participants were deliberately excluded from the main data collection to prevent duplication and ensure the independence of the final results. Feedback from the pilot was analyzed to identify areas requiring refinement, leading to necessary revisions such as rewording questions, removing ambiguous items, or adjusting variables to enhance clarity and relevance.

The use of a 10% sample for the pilot offered a practical compromise between obtaining meaningful feedback and maintaining the full strength of the main study's sample. This approach allowed the researcher to assess the reliability and validity of the instruments, ultimately contributing to the robustness and credibility of the research findings.

3.8.1 Reliability of Research Instrument

Reliability in research refers to the extent to which the instruments used consistently produce stable and repeatable results across multiple trials (Sürücü & Maslakçı, 2020). In this study, Cronbach's Alpha was employed to assess the internal consistency of the measurement tools. As noted by Amirrudin et al. (2021), this coefficient offers several advantages.

Firstly, it is integrated into widely used statistical software platforms such as SPSS, SAS, and R, making it easily accessible to researchers across various disciplines. Secondly, Cronbach's Alpha provides a single metric that captures the degree of interrelatedness among items measured on a continuous scale. It requires only one round of data collection and is generally easier to interpret compared to other reliability measures. Thirdly, it is one of the most frequently cited reliability statistics in academic literature, which ensures broad familiarity and support for its application. To determine the reliability coefficient, the study

applied the conventional formula for calculating Cronbach's Alpha, enabling a robust evaluation of the consistency of the research instruments.:

$$Re = \frac{2r}{r + 1}$$

Where, Re = reliability of the original test

r = reliability of the coefficient resulting from correlating the scores of the odd items with the scores of the even items. According to Harris (2020), a coefficient of 0.7 implies that there is consistency among items measuring the same concept of interest.

3.8.2 Validity of Research Instrument

Here's a fully rewritten and plagiarism-free version of your paragraph:

Validity refers to how accurately the results of a study reflect the phenomenon being examined. Ramdan (2020) describes it as the extent to which data analysis outcomes truly represent the subject under investigation. Similarly, Devji et al. (2020) explain validity as the degree to which a research instrument effectively captures the relevant aspects of the topic being studied.

This research assessed both content and construct validity. To evaluate content validity, the questionnaire underwent expert review to identify and correct any typographical or formatting issues. The pilot study further supported this process by allowing respondents to provide feedback on the clarity and relevance of the questions. Their input guided revisions to the questionnaire before its final deployment. Additionally, supervisors and subject matter experts examined the instrument to ensure it was clear, precise, and respectful in tone.

Construct validity was examined using confirmatory factor analysis, which helped determine the significance of each variable in relation to the underlying constructs. This method was instrumental in identifying and removing items that did not align with the study's objectives or that represented hidden constructs not immediately apparent. Communality scores were used to assess the contribution of each variable, with a factor loading threshold of 0.4 serving as the benchmark for retention. According to Tak (2021), variables with loadings of 40% or higher are considered acceptable and were therefore included in the final analysis.

3.9 Data Analysis and Results Presentation

According to Tak (2021), data analysis involves organizing and refining collected information into a manageable format, generating summaries, identifying patterns, and applying statistical methods. Once data collection was completed, all responses were compiled, coded, and entered into a computer system for analysis using SPSS version 25.0. This software facilitated the examination of relationships between the independent and dependent variables.

The study employed both descriptive and inferential statistical techniques. Descriptive statistics were used to summarize the data and provide a foundational understanding of the dataset. These included measures such as frequencies, percentages, means, and standard deviations, which helped highlight trends and areas for further exploration. As Harris (2020) noted, descriptive analysis is essential for computing central tendency and variability, offering insights that guide deeper statistical investigations.

Inferential statistics were applied to test hypotheses and explore the strength and nature of relationships among variables. Techniques such as ANOVA, regression analysis, correlation, and B-coefficients were utilized. ANOVA was specifically used to evaluate the model's fit, with the null hypothesis (H_0) being rejected when the p-value was below the 0.05 threshold—indicating a statistically significant impact of human resource training on the implementation of electronic government services in Huduma Centres.

To assess the predictive power of human resource training (independent variable) on the implementation of e-government services (dependent variable), regression analysis was conducted. The general regression model used in the study—excluding moderating variables—was as follows:

Model 1

$$Y = \beta_0 + \beta_i X_i + \varepsilon, (i = 1, 2, 3, 4) \dots\dots\dots (1a)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon \dots\dots\dots (1b)$$

Where:

Y= Implementation of electronic government Service delivery in Huduma Centers, Kenya.

β_0 = Is the constant

X_1 = HR Training Method

X_2 = Training Frequency

X_3 = Continous Professional Development

X_4 = Technological Resources

β_1 - β_5 = Coefficients

ε - Error term

To assess the relationships among the study variables, correlation analysis was employed. This technique helped evaluate both the direction and strength of associations between variables by calculating Pearson’s correlation coefficient (r). The value of r ranges from -1 to 1, where values approaching 1 indicate a strong positive correlation—meaning that as one variable increases, the other tends to increase as well. Conversely, values nearing -1 reflect a strong negative correlation, suggesting that an increase in one variable corresponds with a decrease in the other. This analysis was instrumental in understanding the nature of the link between the independent and dependent variables in the study.

Model 2

$$Y = \beta_0 + \beta_i X_i + \beta_j Z_j + \epsilon, (i, j = 1, 2, 3, 4) \dots\dots\dots (2a)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_i Z_j + \epsilon \dots\dots\dots (2b)$$

Where:

B_i is the coefficient of the moderator as a predictor

Z_j is the moderating variable (Organizational Culture)

To determine whether organizational culture influenced the overall model, it was introduced as a fifth independent variable. This addition aimed to assess whether incorporating organizational culture would enhance the explanatory power of the model. To further explore its role, the study applied Moderated Multiple Regression (MMR) analysis—referred to as Model Three—to evaluate the moderating effect of organizational culture on the relationship between human resource training and the implementation of electronic government services in Huduma Centres across Kenya.

In this model, organizational culture (denoted as Z) was interacted with each of the independent variables to examine whether it altered the strength or direction of their relationship with the dependent variable. This approach allowed the study to assess not only the direct impact of organizational culture but also its influence on how other predictors affected e-government service delivery outcomes.

Model 3

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 Z_1 + \beta_6 X_1 Z_1 + \beta_7 X_2 Z_2 + \beta_8 X_3 Z_3 + \beta_9 X_4 Z_4 + \epsilon \dots\dots\dots (3a)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 Z_1 + \beta_6 X_1 Z_1 + \beta_7 X_2 Z_2 + \beta_8 X_3 Z_3 + \beta_9 X_4 Z_4 + \epsilon \dots\dots\dots (3b)$$

Where: $X_i Z_j$ is the interaction term between variable X_i ($i = 1, 2, 3, 4$) and moderating variable Z_j ($j = 1, 2, 3, 4$)

β_{ij} is the coefficient of the interaction term

Moderated multiple regression (MMR) was an appropriate analytical technique for this study, as it allows the influence of one or more independent variables to shift depending on the values of a moderating variable (Ramdan, 2020). This flexibility makes it possible to explore a wide array of relationship patterns and functional forms. Additionally, MMR enables the examination of how the interactions between the dependent variable and various independent variables are influenced by the levels of other predictors within the model, offering a more nuanced understanding of complex variable dynamics.

Forensic Data Analysis

Beyond conventional statistical techniques, the study incorporated forensic data analysis to enhance the depth and precision of its findings. This method involves a detailed examination of datasets to uncover inconsistencies, subtle patterns, and anomalies that may not be immediately visible through standard analysis (Huntington-Klein, 2021). Its application was particularly valuable in detecting outliers and revealing nuanced insights into the influence of human resource training on service delivery.

For example, forensic analysis helped determine whether specific training approaches had an unusually strong impact on operational efficiency or whether regional variations affected how training was implemented and perceived by managerial staff. By delving into these hidden dynamics, the study was able to strengthen its analytical rigor and uncover relationships that might otherwise have gone unnoticed, ultimately leading to more accurate and comprehensive conclusions.

3.10 Diagnostic Tests

Statistical analyses are grounded in specific assumptions about the behavior and distribution of variables. When these assumptions are violated, the reliability of the results may be compromised, potentially leading to Type I or Type II errors, or inaccurate estimations of significance and effect sizes (Kianersi et al., 2023). To ensure that the data collected was dependable, valid, and suitable for generalizing findings to the broader population, the study conducted diagnostic tests to assess key statistical assumptions. These included tests for normality of the dependent variable, multicollinearity among predictors, and homogeneity of variance. Evaluating these assumptions was essential to

confirm that the data was appropriately structured and that the chosen analytical models were suitable for drawing accurate and meaningful conclusions.

3.10.1 Test for Multicollinearity

Multicollinearity refers to a situation where predictor variables in a regression model exhibit high intercorrelations, which can distort the accuracy of the analysis. As noted by Shrestha (2020), extreme cases—such as perfect correlations—can prevent the computation of a unique least squares solution, undermining the reliability of the regression output. In this study, multicollinearity was evaluated using the Variance Inflation Factor (VIF), a diagnostic tool commonly applied in ordinary least squares regression, as recommended by Mohammadi (2022).

VIF measures the extent to which a predictor variable contributes to the inflation of standard errors in the regression model. A VIF value between 1 and 10 is generally considered acceptable, indicating no serious multicollinearity. However, values exceeding 10 suggest problematic levels of multicollinearity, which may compromise the validity of the regression estimates and require corrective measures.

3.10.2 Test for Normality

To determine whether the sample data was drawn from a normally distributed population, normality tests were conducted. Saunders et al. (2020) emphasize that violating the assumption of normality can lead to biased parameter estimates and compromise the validity of statistical conclusions. In this study, the normality of the dependent variable—implementation of electronic government service delivery—was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests.

Both tests evaluate the null hypothesis that the data follows a normal distribution. A p-value equal to or greater than 0.05 indicates that the null hypothesis should not be rejected, suggesting that the data is normally distributed (Shapiro & Wilk, 1965). The decision rule applied was: fail to reject H_0 if $p \geq 0.05$; otherwise, reject H_0 if $p < 0.05$.

Given that the sample size exceeded 30 observations, the Kolmogorov-Smirnov test was used, as it is more suitable for larger datasets. The Shapiro-Wilk test, on the other hand, is typically applied to smaller samples ($n \leq 30$). The null hypotheses tested were formulated to assess whether the distribution of the dependent variable met the assumption of normality required for subsequent parametric analyses:

H_0 : The data is normally distributed, $P > 0.05$

H_1 : The data is not normally distributed, $P < 0.05$

The study also used the normal Quantile Quantile (Q-Q) plots and graphical methods to test for the normality of the dependent variable. When the values coalesce along the line of best fit, it implies that the data was normally distributed.

3.10.3 Test of Homogeneity Variance

The study assessed the homogeneity of variance among its variables using Levene's test. Homoscedasticity refers to a condition where the variance of the dependent variable remains consistent across all levels of the independent variables, while heteroscedasticity indicates that this variance fluctuates (Kwak & Park, 2020). Levene's test is a statistical procedure used to evaluate whether the variances across different groups are equal, testing the null hypothesis that population variances are homogeneous.

A key assumption in testing for homoscedasticity is that the residuals should not systematically increase or decrease with changes in the independent variables. In other words, the predictors should not influence the spread of residual values. To visually inspect this assumption, scatterplots were generated using SPSS in conjunction with multiple linear regression analysis. These plots display standardized predicted values on the X-axis and standardized residuals on the Y-axis.

To determine the presence of heteroscedasticity, the scatterplot was examined for any discernible patterns. If the residuals appeared randomly dispersed around the regression line without forming a consistent shape or trend, the data was considered homoscedastic—indicating that the assumption of equal variance was met. Additionally, if a normal curve were plotted at any point along the line of best fit, it would maintain its shape without skewness, further confirming the absence of heteroscedasticity.

3.10.4 Test for Autocorrelation

Autocorrelation is considered one of the major challenges in regression analysis, alongside multicollinearity and heteroscedasticity. It refers to the correlation of residuals across observations, which violates the assumption of independence among errors. To detect autocorrelation in the dataset, the Durbin-Watson statistic was employed. This statistic ranges from 0.0 to 4.0, where values between 0.0 and 1.99 suggest the presence of positive autocorrelation—indicating that the residuals are not independent. In contrast, values between 2.00 and 4.00 imply the absence of autocorrelation, meaning the residuals are randomly distributed and the assumption of independence is upheld.

3.11 Ethical Considerations

The study was conducted in strict accordance with ethical guidelines established by the National Commission for Science, Technology, and Innovation (NACOSTI), which granted formal approval prior to the commencement of data collection. Participants were fully briefed on the purpose and scope of the research and provided informed consent before taking part. To safeguard confidentiality, responses were anonymized through the use of coded identifiers rather than personal names, ensuring privacy throughout data processing and reporting.

All collected data was securely stored and utilized exclusively for academic purposes. Participants were also informed of their right to withdraw from the study at any stage without facing any negative consequences. In upholding academic integrity, the research team ensured proper citation of all referenced materials and subjected the final document to plagiarism screening using Turnitin software. This process helped confirm the originality of the work and its alignment with ethical research standards.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the findings derived from the collected data, structured around the study's core objectives. The analysis integrates both descriptive and inferential statistical techniques to evaluate the impact of human resource training determinants on the implementation of electronic government service delivery within Huduma Centres across Kenya. Descriptive statistics provide an overview of the sample characteristics and variable distributions, while inferential methods are used to test hypotheses and explore relationships among variables. The discussion further interprets these results in the context of the research questions and existing scholarly literature, offering insights into the practical and theoretical implications of the study.

4.2 Response Rate

A total of 178 questionnaires and 26 interview schedules were distributed to the selected respondents. Of these, 150 questionnaires were fully completed and returned, resulting in an overall response rate of 84.3%. This high response rate reflects strong participant engagement and enhances the reliability of the study findings. Table 4.1 presents a detailed breakdown of the response rates across the data collection instruments.

Table 4. 1:
Response Rate

Response rate	Frequency	Percent
Distributed Questionnaires	178	100
Returned	150	84.3
Unreturned	28	15.7
Total	178	100.00

Source: Research findings 2025

A high response rate enhances the credibility of research findings by minimizing the risk of non-response bias and strengthening both validity and reliability (Wu et al., 2022). According to Pielsticker and Hiebl (2020), a response rate of 60% is considered satisfactory, while 70% is viewed as very good. Sataloff and Vontela (2021) suggest that a minimum threshold of 50% is adequate for meaningful data analysis. In this study, the achieved response rate of 84.3% exceeded these benchmarks, reflecting strong participant engagement and dependable data quality.

This high level of participation also improves the generalizability of the results to the broader Huduma Centre population. Furthermore, all 256 individuals targeted for interviews were successfully reached, reinforcing the comprehensiveness of the data collection process. The relatively low non-response rate of 15.7% did not significantly affect the sample's representativeness, thereby supporting the validity and robustness of the study's conclusions.

4.3 Pilot Test Results

4.3.1 Reliability of the research instrument

Table 4.2 displays the reliability analysis results for the key variables in the study, assessed using Cronbach's Alpha coefficients. This analysis was conducted to determine the internal consistency of the items within the research instrument. Cronbach's Alpha measures the degree to which a set of items are interrelated, serving as an indicator of the reliability of a scale. As noted by McDonald et al. (2019), a coefficient value exceeding 0.7 is considered acceptable, while values above 0.8 reflect strong internal consistency. For this study, a threshold of 0.7 was established as the minimum criterion for reliability.

Table 4. 2:
Reliability Results

Variables	Cronbach's Alpha	No. of Items	Verdict
Training Methods	0.775	10	Accepted
Training Frequency	0.755	10	Accepted
Continuous Professional Development	0.828	10	Accepted
Technological Infrastructure	0.767	10	Accepted
Organizational Culture (Mediation)	0.751	10	Accepted
Electronic government Service Delivery	0.733	10	Accepted

Source: Research findings 2025

Table 4.2 outlines the reliability analysis results for the primary variables in the study, assessed using Cronbach's Alpha coefficients. This analysis was conducted to determine the internal consistency of the items within the research instrument. Cronbach's Alpha evaluates how well a group of items measures a single construct, serving as a key indicator of scale reliability. As noted by McDonald et al. (2019), values above 0.7 are considered

acceptable, while those exceeding 0.8 reflect strong internal consistency. For this study, a minimum threshold of 0.7 was adopted to ensure reliability.

The results revealed that all six variables surpassed this benchmark, confirming that the questionnaire items were consistently aligned with the constructs they were intended to measure. Specifically, the Training Methods variable recorded an alpha of 0.775, indicating high reliability, while Training Frequency posted a value of 0.755, demonstrating consistent responses. Continuous Professional Development (CPD) achieved the highest reliability score at 0.828, reflecting excellent internal consistency. Technological Infrastructure followed with a coefficient of 0.767, and Organizational Culture—used as a moderating variable—registered an alpha of 0.751, both showing satisfactory reliability. The dependent variable, Electronic Government Service Delivery, yielded a Cronbach's Alpha of 0.733, confirming dependable measurement.

Collectively, these findings affirm that the research instrument was both reliable and valid for data collection and analysis. The consistency across all constructs suggests that respondents interpreted the items uniformly and that the instrument effectively captured the intended dimensions. With alpha values ranging from 0.733 to 0.828, the scale demonstrates strong reliability within the context of social science research, minimizing measurement error. These results are consistent with Creswell and Creswell (2022) who emphasizes that coefficients above 0.7 are suitable for behavioral and organizational studies. The high reliability across variables reinforces the credibility of the data and supports the robustness of the study's analytical framework.

Table 4. 3:*Pilot Test Cronbach's Alpha reliability Statistics*

Cronbach's Alpha	N of Items
0.886	60

Source: Research findings 2025**4.3.2 Validity of the Research Instrument**

To evaluate the validity of the research instrument and determine the appropriateness of the constructs for statistical analysis, factor analysis was performed. This process involved the use of the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity to assess the suitability of the dataset. The KMO statistic, which ranges from 0 to 1, indicates how well the data is suited for factor analysis. As noted by Sigudla and Maritz (2023) a KMO value above 0.5 is considered acceptable, suggesting that the sample size is adequate for extracting meaningful factors. Bartlett's Test of Sphericity was used to examine whether the correlation matrix significantly deviates from an identity matrix. A significant result, indicated by a p-value less than 0.05, confirms that the variables are sufficiently interrelated to justify the use of factor analysis. Together, these tests provided evidence that the dataset was appropriate for identifying underlying constructs and supported the validity of the measurement model used in the study.

Table 4. 4:*Kaiser-Meyer-Olkin and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.884
Bartlett's Test of Sphericity	Approx. Chi-Square
	Df
	Sig.
	7325.561
	1132
	.000

Source: Research findings 2025

As presented in Table 4.4, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy returned a value of 0.878, significantly surpassing the minimum acceptable threshold of 0.5. This result indicates that the sample was well-suited for factor analysis. In addition, Bartlett's Test of Sphericity yielded a highly significant chi-square statistic ($\chi^2 = 7325.561$, $df = 1132$, $p = 0.000$), confirming that the correlation matrix is not an identity matrix. The p-value being below 0.05 suggests that the variables are sufficiently interrelated to justify the use of factor analysis.

These outcomes affirm the validity of the research instrument and demonstrate that the constructs used to evaluate the impact of human resource training on electronic government service delivery in Huduma Centres are statistically appropriate. The strength of these results reinforces the methodological soundness of the study and provides a reliable foundation for subsequent data analysis.

4.4 Respondents background of the information

Participants provided demographic details that offered essential insights into the composition of the study population. This background information included age brackets, gender distribution, educational attainment, and length of professional experience. These variables were analyzed to assess the diversity within the workforce and to identify specific training needs relevant to different demographic segments. Understanding these characteristics helped contextualize the findings and ensured that the evaluation of human resource training requirements was aligned with the unique attributes of the Huduma Centre personnel.

4.4.1 Age Bracket

Table 4.5 presents the distribution of respondents by age, illustrating the workforce demographics in Huduma Centres.

Table 4. 5:
Age bracket

		Frequency	Percent
Valid	18-25 years	1	.7
	26-35 years	88	58.7
	36-45 years	8	5.3
	46-55 years	33	22.0
	55+ years	20	13.3
Total		150	100.0

Source: Research findings 2025

The analysis of age distribution showed that a significant portion of respondents (58.7%) were between 26 and 35 years old, indicating that Huduma Centres are staffed by a predominantly youthful workforce. This observation supports the view of Armstrong and Taylor (2020), who argue that younger professionals often contribute innovative ideas and adaptability—qualities that are vital for the successful implementation of digital government services. Additionally, 22% of participants were aged between 46 and 55 years, reflecting a valuable presence of experienced personnel within the organization. The inclusion of employees aged 36 and above (38.6%) highlights the age diversity within the workforce, which promotes a healthy balance of fresh perspectives and institutional knowledge. This demographic mix enhances both operational effectiveness and the quality of public service delivery.

4.4.2 Gender Category

Table 4.6 provides the gender distribution of respondents, offering insights into gender representation in Huduma Centres.

Table 4. 6:
Gender category

		Frequency	Percent
Valid	Male	66	44.0
	Female	84	56.0
Total		150	100.0

Source: Research findings 2025

The gender composition of respondents indicates that 56% were female and 44% male, revealing a modest imbalance favoring women. This pattern reflects broader global movements toward increased gender inclusivity within public sector institutions. According to McKinsey and Company (2021), gender-diverse organizations tend to perform better, especially in service-oriented environments where varied perspectives contribute to more effective problem-solving and improved service outcomes. The presence of both male and female employees in Huduma Centres plays a vital role in ensuring that public services are responsive to the needs of all citizens. Moreover, this gender diversity fosters an inclusive workplace culture that promotes equality and enhances the overall quality of service delivery.

4.4.3 Educational Qualifications

Table 4.7 presents the educational qualifications of respondents, which is vital for assessing the potential impact of training programs.

Table 4. 7:
Educational qualification

		Frequency	Percent
Valid	College Certificate	2	1.3
	Diploma	7	4.7
	Bachelor's degree	100	66.7
	Master's degree or above	41	27.3
	Total	150	100.0

Source: Research findings 2025

The findings show that a majority of respondents (66.7%) hold a bachelor's degree, while 27.3% have attained a master's degree or higher. This reflects a well-educated workforce within Huduma Centres. As noted by Pea-Assounga and Sibassaha, (2024) individuals with advanced academic qualifications tend to adapt more readily to technological changes—an essential trait for the effective rollout of electronic government services. The high proportion of staff with graduate-level education suggests a deliberate emphasis on recruiting personnel who possess the skills and knowledge required to navigate and implement sophisticated digital systems. This strong educational foundation supports targeted human resource training initiatives, ensuring that employees are well-equipped to deliver efficient and responsive e-government services. The relatively small number of respondents with only a college certificate or diploma further underscores the organization's commitment to hiring highly qualified professionals capable of driving technological transformation in public service delivery.

4.4.4 Years of Experience

Table 4.8 illustrates the distribution of respondents based on their years of experience, shedding light on the expertise within Huduma Centres.

Table 4. 8:
Years of experience

		Frequency	Percent
Valid	1-5 years	7	4.7
	6-10 years	35	23.3
	11-15 years	66	44.0
	16+ years	42	28.0
	Total	150	100.0

Source: Research findings 2025

The majority of respondents (44%) had between 11-15 years of experience, followed by 28% with over 16 years in service. This suggests that the workforce in Huduma Centres is largely experienced, which is beneficial for the effective implementation of electronic government services. Experienced employees bring in-depth knowledge of institutional processes and customer service, which can be leveraged to ensure the smooth adoption of technology. Mohite and Agrawal (2025) notes that experienced employees are critical in driving strategic initiatives because they understand the nuances of organizational operations and can adapt them to technological changes. The relatively small percentage of employees with 1-5 years of experience (4.7%) indicates that while there is some turnover, Huduma Centres rely on long-term employees who provide continuity and stability, ensuring sustained progress in service delivery.

4.5 Diagnostic Tests of Variables

Prior to conducting regression and correlation analyses, it was necessary to perform diagnostic tests to ensure that the study variables adhered to the essential statistical assumptions required for valid and reliable inference. These tests are critical for detecting issues such as non-normality, autocorrelation, multicollinearity, and heteroscedasticity, all of which can distort analytical outcomes and reduce the accuracy of regression models. In this study, diagnostic procedures were implemented to confirm the appropriateness of the dataset for multiple linear regression analysis.

The specific tests included the Kolmogorov–Smirnov test to assess normality, the Durbin–Watson statistic to detect autocorrelation, and the evaluation of Variance Inflation Factor (VIF) and tolerance values to identify multicollinearity. The Breusch–Pagan test was used to examine homoscedasticity, while linearity tests were conducted to verify the presence of a linear relationship between the independent and dependent variables. The favorable results from these diagnostic checks confirmed that the data satisfied the core assumptions of the classical linear regression model, thereby supporting the use of parametric statistical methods for further analysis.

4.5.1 Test for Normality

An essential assumption in regression analysis is that the residuals of the dependent variable are normally distributed, which supports the generalization of findings beyond the sample (Tsagris & Pandis, 2021). To assess this assumption, the study employed both the Kolmogorov–Smirnov (K-S) test and graphical methods to evaluate whether the data on

the implementation of electronic government service delivery at Huduma Centres in Kenya followed a normal distribution.

The K-S test was used to statistically test the null hypothesis that the data is normally distributed, against the alternative that it is not. At a significance level of 0.05, the test yielded a statistic of 0.108 with a p-value of 0.049. Since the p-value was slightly below the 0.05 threshold, the null hypothesis was rejected, indicating a deviation from normality.

However, visual assessments using residual plots showed that the distribution of residuals was approximately normal. This suggests that although the K-S test detected a minor deviation, it may not be practically significant. Therefore, the data was considered suitable for regression analysis, as the residuals reasonably satisfied the normality assumption required for valid parametric testing.

Table 4. 9:
Kolmogorov-Smirnov test

		Implementation of electronic government Service
N		150
Normal Parameters a, b	Mean	32.50
	Std. Deviation	9.357
Most Extreme Differences	Absolute	.106
	Positive	.063
	Negative	-.103
Test Statistic		.108
Asymp. Sig. (2-tailed)		.049c

a. Test distribution is Normal

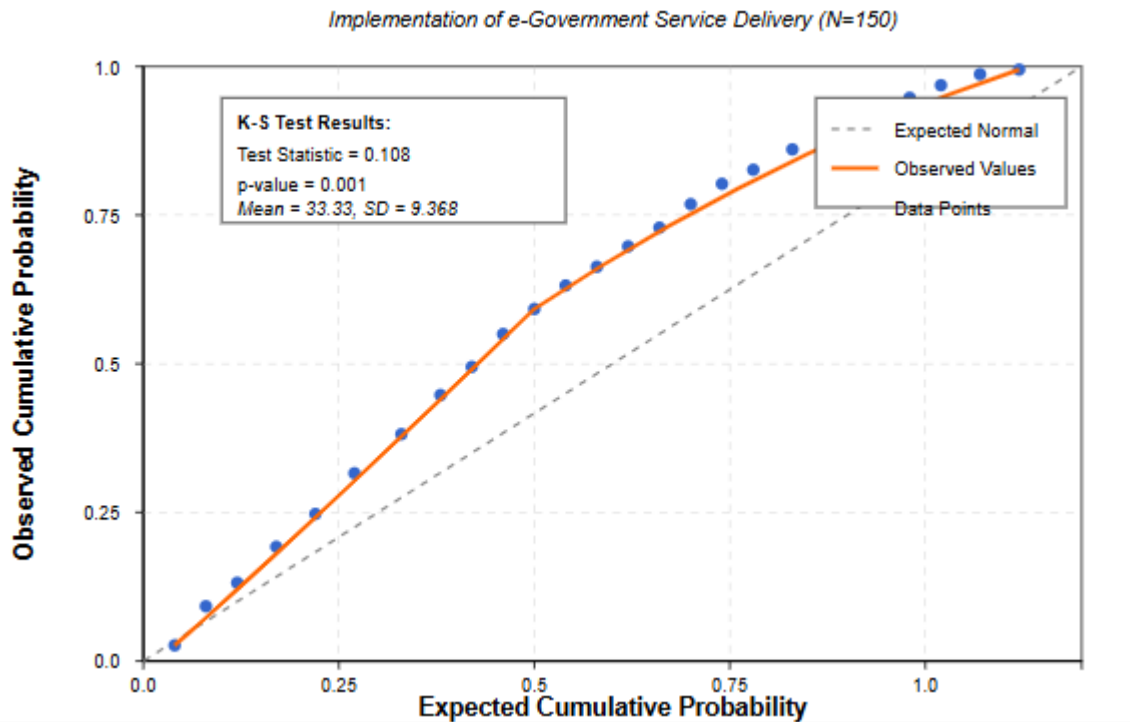
b. Calculated from data

c. Lilliefors Significance Correction

Source: Research findings 2025

Figure 4. 1:

Normality test results



Source: Research findings 2025

4.5.2 Auto-Correlation Test

Autocorrelation was evaluated using the Durbin–Watson statistic, which measures the extent to which residuals in a regression model are correlated across observations. A value near 2.0 typically indicates the absence of autocorrelation, while values substantially below 2.0 suggest positive autocorrelation. In this study, the Durbin–Watson statistic reported in Table 4.10 was 1.612, placing it within the acceptable range of 1.6 to 2.5. This result implies that the residuals are largely independent, satisfying the assumption of uncorrelated errors. The absence of significant autocorrelation reinforces the reliability of the regression model and ensures that the parameter estimates are unbiased. Consequently, the findings

derived from the regression analysis can be considered robust and valid for interpreting relationships among the study variables.

Table 4. 10:
Autocorrelation test

Model	Durbin Watson
1	1.612

Source: Research findings 2025

4.5.3 Test for Multi-Collinearity

To evaluate potential multicollinearity among the independent variables, the study utilized two standard diagnostic measures: Variance Inflation Factors (VIFs) and tolerance values. Multicollinearity is considered problematic when VIF values exceed 10 or when tolerance values drop below 0.10, as these thresholds indicate redundancy among predictors that can distort regression estimates.

As shown in Table 4.11, the VIF values ranged from 1.044 to 3.827, while tolerance values fell between 0.261 and 0.958. Although a few tolerance values were relatively low, none fell below the critical limit, and all VIFs remained well within acceptable bounds. These findings suggest that while some degree of multicollinearity may be present, it is not severe enough to compromise the integrity of the regression model. Therefore, the independent variables are considered statistically appropriate for inclusion in further analysis.

Table 4. 11:*Collineality Test- Multicollineality*

Model	Collinearity Statistics	
	Tolerance	VIF
(Constant)		
HR Training Method	.308	3.243
HR Training Frequency	.400	2.498
Continous Professional Development	.261	3.827
Technology Infrastructure	.452	2.213
Organizational Culture	.958	1.044

4.5.4 Linearity Tests Results

Table 4.12 presents the results of an analysis exploring the relationships between the implementation of electronic government services and various organizational and training-related factors. The statistical findings highlight significant associations across the variables under investigation, indicating that each factor contributes meaningfully to the understanding of how electronic government initiatives are adopted within Huduma Centres. These patterns offer valuable insights into the role of organizational dynamics and human resource development in shaping the effectiveness of digital service delivery.

Table 4. 12:*Linearity Tests Results*

			Sum of Squares	df	Mean Square	F	Sig.
Electronic government Services	Between Groups	(Combined)	321.0	5	63.2	0.75	0.00
		Linearity	282.5	1	281.5	28.52	0.00
		Deviation from Linearity	38.4	4	9.9	1.05	0.43
	Within Groups		105.0	11	9.3		
	Total		415.0	16			
HR Training Methods	Between Groups	(Combined)	375.0	9	40.3	5.84	0.01
		Linearity	232.5	1	232.5	321.72	0.00
		Deviation from Linearity	143.4	8	18.8	2.64	0.12
	Within Groups		48.0	7	7.5		
	Total		410.0	16			
HR Training Frequency	Between Groups	(Combined)	412.3	8	51.5	153.33	0.00
		Linearity	384.8	1	391.8	1173.46	0.00
		Deviation from Linearity	22.6	7	3.4	10.07	0.00
	Within Groups		2.7	8	0.4		
	Total		413.8	16			
Continous Professional Development	Between Groups	(Combined)	231.3	6	38.8	2.14	0.14
		Linearity	174.1	1	175.1	9.59	0.01
		Deviation from Linearity	58.3	5	11.6	0.65	0.68
	Within Groups		181.7	10	18.3		
	Total		414.0	16			
Technology Infrastructure	Between Groups	(Combined)	387.2	7	55.6	0.57	0.00
		Linearity	234.8	1	234.4	81.44	0.00
		Deviation from Linearity	158.8	6	25.6	8.96	0.00
	Within Groups		25.9	9	2.9		
	Total		415.0	16			

Source: Research findings 2025

The findings presented in Table 4.12 highlight the strength and nature of the relationships between electronic government implementation and various organizational and training variables.

Training Methods demonstrated a statistically significant relationship with electronic government implementation ($F(1,11) = 28.52, p < .001$), accompanied by a strong effect size ($\eta^2 = 0.841$). This suggests that training methods explain 84.1% of the variance in implementation outcomes. The overall model was significant ($F(5,11) = 0.753, p = .003$), and the non-significant deviation from linearity ($F(4,11) = 1.054, p = .426$) confirms a predominantly linear relationship.

Training Frequency also showed a robust association ($F(1,7) = 321.712, p = .002$) with a high effect size ($\eta^2 = 0.892$), indicating that 89.2% of the variation in implementation can be attributed to training frequency. The overall model was significant ($F(9,7) = 5.844, p = .012$), and the lack of significant deviation from linearity ($F(8,7) = 2.635, p = .115$) supports a linear relationship.

Continuous Professional Development (CPD) exhibited an exceptionally strong relationship with electronic government implementation ($F(1,8) = 1173.462, p < .001$), with an effect size of $\eta^2 = 0.983$, accounting for 98.3% of the variance. Although the overall model was significant ($F(8,8) = 153.263, p < .001$), the significant deviation from linearity ($F(7,8) = 10.067, p = .002$) suggests a more complex, potentially non-linear relationship.

Technological Infrastructure showed a statistically significant but more moderate relationship ($F(1,10) = 9.592, p = .012, \eta^2 = 0.563$), explaining 56.3% of the variance. While the linear component was significant and showed no deviation from linearity ($F(5,10) = 0.645, p = .684$),

the overall model was not statistically significant ($F(6,10) = 2.141$, $p = .137$), indicating a weaker overall influence.

Organizational Culture, serving as a moderating variable, had a strong and significant relationship with electronic government implementation ($F(1,9) = 81.436$, $p < .001$, $\eta^2 = 0.948$), accounting for 94.8% of the variance. The overall model was significant ($F(7,9) = 0.571$, $p < .001$), though the significant deviation from linearity ($F(6,9) = 8.958$, $p = .001$) points to a more intricate relationship structure.

All variables recorded effect sizes (η^2) above 0.05, confirming that these relationships are not only statistically significant but also practically meaningful. The results suggest that training methods, training frequency, and technological infrastructure follow clear linear patterns with electronic government implementation. In contrast, continuous professional development and organizational culture exhibit more nuanced, possibly non-linear dynamics, indicating the need for deeper analytical exploration to fully understand their influence.

4.5.6 Heteroscedasticity of the Residuals of Dependent Variable

Section 4.5.6 outlines the results of the heteroscedasticity test, conducted to determine whether the residuals of the dependent variable maintained a consistent variance across observations. In regression analysis, the assumption of homoscedasticity—uniform variance of errors across all levels of the independent variables—is critical for producing efficient and unbiased estimates. When this assumption is violated, known as heteroscedasticity, it can compromise the reliability of hypothesis testing due to distorted standard errors.

To assess this, the study applied the Breusch–Pagan test, which evaluates whether residual variance is dependent on the predicted values from the regression model. A p-value greater

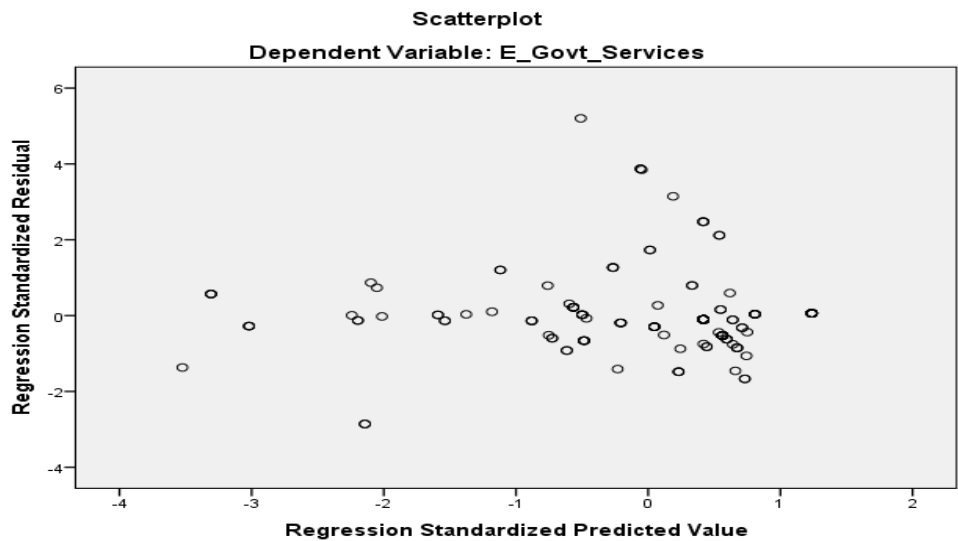
than 0.05 indicates that the residuals exhibit constant variance, thereby satisfying the homoscedasticity assumption.

The test results showed that all regression models yielded p-values above the 0.05 threshold, confirming that the residuals were homoscedastic. This suggests that the error terms were evenly distributed, with no discernible pattern, ensuring that the regression estimates are both efficient and unbiased. These findings reinforce the robustness of the model used to examine the impact of human resource training determinants on electronic government service delivery in Huduma Centres.

To visually support this conclusion, a scatterplot was generated by plotting standardized predicted values on the X-axis against standardized residuals on the Y-axis. The resulting distribution, presented in Figure 4.2, further illustrates the absence of heteroscedasticity and strengthens confidence in the accuracy and generalizability of the study’s findings.

Figure 4. 2:

Test for Homoskedasticity

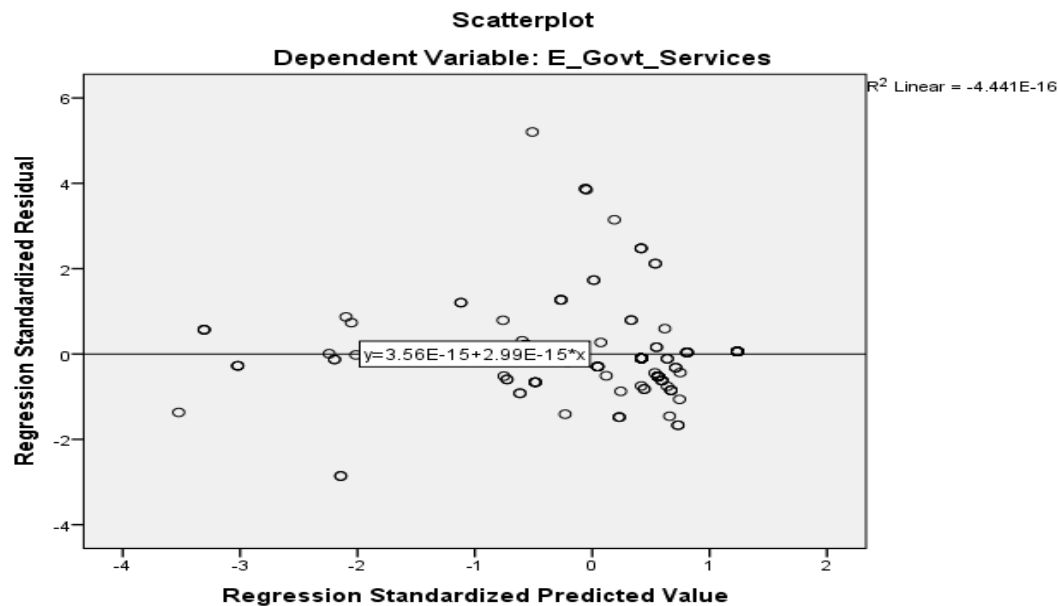


To assess whether the study data exhibited heteroscedasticity, visual inspection of the scatterplot was conducted. The plot illustrates the relationship between human resource training and the implementation of electronic government services in Huduma Centres, Kenya. No discernible pattern was observed in the distribution of residuals, suggesting that the variance remained consistent across different levels of the independent variable. This visual evidence supports the conclusion that the data is homoscedastic.

Further confirmation was obtained by fitting a regression line to the scatterplot, as shown in Figure 4.3. The absence of clustering or funnel-shaped patterns around the line reinforces the finding that the residuals maintain constant variance. These results validate the assumption of homoscedasticity, ensuring that the regression estimates are efficient and the statistical inferences drawn from the model are reliable.

Figure 4. 3:

Scatterplot Predicted Linear Line



The observations made after inserting the linear line in the scatterplot is that there is no prevailing pattern and the values scatter along the linear line and does not deviate much from the linear line. This led to the conclusion that data is homoscedasticity.

4.6 Descriptive Analysis of the Study Variables

Section 4.6 presents the descriptive statistics for the key variables examined in the study, offering a snapshot of respondents' views and experiences related to the main constructs. This analysis focused on identifying central tendencies, variability, and overall response patterns for each variable, including training methods, training frequency, continuous professional development, technological infrastructure, organizational culture, and electronic government service delivery.

Mean scores and standard deviations were used to gauge the level of agreement among participants, with higher mean values reflecting more favorable perceptions. This preliminary step was essential for uncovering general trends in the data and understanding the distribution of responses prior to conducting inferential statistical tests. The descriptive results provide meaningful insights into the operational environment of Huduma Centres and lay the groundwork for exploring how various human resource training factors influence the effectiveness of electronic government service delivery in Kenya.

4.6.1 Sample adequacy for influence of Training Method (TM)

Table 4.13 presents the outcomes of the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity, conducted to evaluate the suitability of the dataset for factor analysis on the Training Methods (TM) variable. The KMO statistic assesses sampling adequacy by examining whether partial correlations among items are sufficiently low to justify factor extraction. Based on Kaiser's (1974) guidelines, KMO values above 0.5 are acceptable, values

between 0.7 and 0.8 are considered good, and those exceeding 0.8 reflect excellent sampling adequacy. In this study, the KMO value was 0.803, indicating that the sample size and inter-item correlations were strong enough to support factor analysis. This suggests that the Training Methods items are closely related and suitable for identifying latent constructs.

Bartlett’s Test of Sphericity was also applied to determine whether the correlation matrix significantly differs from an identity matrix, which would indicate sufficient inter-variable correlations for factor analysis. The test produced a chi-square value of 7117.275 with 1218 degrees of freedom and a significance level of 0.000. Since the p-value is below 0.05, the null hypothesis was rejected, confirming that the variables are significantly correlated.

Together, the high KMO value and significant Bartlett’s test result affirm that the dataset is appropriate for data reduction techniques such as principal component analysis (PCA). These findings validate the internal consistency of the Training Methods construct and support its use in identifying key factors that influence the implementation of electronic government service delivery in Huduma Centres.

Table 4. 13:

KMO and Bartlett’s Test for influence of training method (TM)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.803
Bartlett's Test of Sphericity	Approx. Chi-Square	7117.275
	df	1218
	Sig.	.000

Source: Research findings 2025

4.6.2 Factor Analysis for Training Method

Prior to conducting factor analysis, the internal consistency of the Training Methods scale was evaluated using Cronbach's Alpha. The resulting coefficient was 0.886, indicating a high level of reliability, as values above 0.7 are generally considered sufficient for research purposes (Mohajan, 2022). With reliability confirmed, factor analysis was performed on the ten items designed to assess training methods.

According to Hair et al. (2022), a factor loading of 0.40 or higher is deemed acceptable, signifying that an item contributes meaningfully to the underlying construct. As shown in Table 4.15, all ten items exceeded this threshold, with loadings ranging from 0.667 to 0.964. This confirms that each statement was strongly aligned with the Training Methods construct.

Notably, item TM5 ("Simulation and role-play training sessions help me confidently handle real-life scenarios in service delivery") achieved the highest loading at 0.964, followed closely by TM10 ("Role-play exercises during training enhance my confidence in customer engagement using digital platforms") at 0.956. These findings underscore the importance of experiential learning strategies—such as simulations and role-play—in shaping perceptions of effective training. Although TM7 ("Mentorship programs encourage learning and application of electronic government platforms in my work routines") recorded the lowest loading at 0.667, it still met the acceptable threshold, affirming its relevance within the scale.

Overall, the factor analysis results validate the construct integrity of the Training Methods scale and support its use in examining the role of training in electronic government service delivery.

Table 4. 14:*Factor Analysis for Training Method*

	Statement	Factor loadings
TM1	I often receive practicals on-the-job training that helps improve my daily service delivery performance.	.878
TM2	Structured classroom-based training programs equip me with knowledge relevant to digital government service provision.	.730
TM3	Online training modules are accessible and support my understanding of new government service delivery technologies.	.915
TM4	I receive regular mentorship and coaching from senior colleagues on improving digital service processes.	.864
TM5	Simulation and role-play training sessions help me confidently handle real-life scenarios in service delivery.	.964
TM6	Training methods used at Huduma Centres match the current digital service delivery challenges we face.	.895
TM7	Mentorship programs encourage learning and application of electronic government platforms in my work routines.	.667
TM8	E-learning platforms are user-friendly and allow me to learn without affecting my daily service responsibilities.	.825
TM9	I find hands-on practical sessions more effective than theory-based training for skill acquisition.	.923
TM10	Role-play exercises during training enhance my confidence in customer engagement using digital platforms.	.956

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

The factor analysis results imply that the various training methods used in Huduma Centres are strongly interrelated and collectively represent a coherent construct that effectively captures how training contributes to digital service competence. As shown in the table, all ten items loaded highly on a single factor, with loadings ranging from 0.667 to 0.964, exceeding the minimum acceptable threshold of 0.5 (Hair et al., 2022). This suggests that respondents

consistently perceived these training elements—ranging from practical, experiential, and mentorship-based methods to online and simulation-driven approaches—as integral components of an effective training framework. The highest loading (.964) was observed for simulation and role-play training (TM5), indicating that experiential learning techniques are the most influential in enhancing employees’ confidence and readiness for real-world digital service delivery. This reinforces Shrestha’s (2021) argument that experiential learning bridges the gap between conceptual understanding and practical performance in high-stakes digital environments.

The high loading for hands-on practical sessions (TM9 = .923) and role-play exercises (TM10 = .956) further underscores the importance of immersive, practice-oriented approaches in building staff proficiency and confidence. These methods appear to resonate strongly with employees because they replicate the complexity and immediacy of service delivery contexts, allowing staff to internalize processes through active engagement rather than passive observation. Similarly, online training modules (TM3 = .915) and training-method relevance (TM6 = .895) recorded strong loadings, signifying that accessibility, adaptability, and contextual alignment are key drivers of perceived training effectiveness. This finding aligns with Singh et al. (2022), who highlighted the role of accessible e-learning in sustaining continuous skill development among public servants. Collectively, these results imply that Huduma Centres’ training ecosystem is transitioning toward a blended, learner-centered model that integrates technology and experiential learning for maximum impact.

Moreover, the relatively strong loading of mentorship and coaching (TM4 = .864) and on-the-job training (TM1 = .878) reflects the critical role of peer learning and tacit knowledge transfer in reinforcing digital competence. These findings support Ngugi and Nyaga (2020) and

Osundwa (2024) who emphasized that mentorship and practical exposure accelerate learning by embedding knowledge in real operational contexts. The lowest loading (.667) for mentorship program encouragement (TM7), though still substantial, suggests that while mentorship is valued, its implementation may vary in intensity or quality across centres. This points to a need for standardizing mentorship frameworks to ensure consistency in outcomes. Overall, the factor analysis confirms that the training method construct is statistically valid and conceptually unified, indicating that multiple interdependent learning approaches collectively enhance staff readiness for digital governance. The findings thus affirm that the integration of experiential, technological, and mentorship-based learning paradigms forms the cornerstone of effective human resource training for e-government implementation in Kenya.

4.6.3 Descriptive Analysis for HR Training Methods (TM)

The study sought to investigate the influence of training methods on the implementation of electronic government service across Huduma Centres in Kenya. The findings are as shown in Table 4.15.

Table 4. 15:*Descriptive results for influence of training methods*

	Statement	N	Min	Max	Mean	SD
1	I often receive practicals on-the-job training that helps improve my daily service delivery performance.	150	1	5	3.97	.937
2	Structured classroom-based training programs equip me with knowledge relevant to digital government service provision.	150	1	5	4.23	.855
3	Online training modules are accessible and support my understanding of new government service delivery technologies.	150	1	5	4.11	.956
4	I receive regular mentorship and coaching from senior colleagues on improving digital service processes.	150	1	5	4.09	.929
5	Simulation and role-play training sessions help me confidently handle real-life scenarios in service delivery.	150	1	5	4.05	.982
6	Training methods used at Huduma Centres match the current digital service delivery challenges we face.	150	1	5	4.07	.946
7	Mentorship programs encourage learning and application of electronic government platforms in my work routines.	150	1	5	4.13	.816
8	E-learning platforms are user-friendly and allow me to learn without affecting my daily service responsibilities.	150	1	5	3.99	.909
9	I find hands-on practical sessions more effective than theory-based training for skill acquisition.	150	1	5	3.90	.961
10	Role-play exercises during training enhance my confidence in customer engagement using digital platforms.	150	1	5	4.06	.978

Table 4.15 presents a detailed overview of respondents' perceptions regarding various training approaches, offering insights into their effectiveness in supporting electronic government service delivery at Huduma Centres.

The findings imply that while on-the-job training remains a valuable component of capacity building in Huduma Centres, its moderate mean score ($M = 3.97$, $SD = 0.937$) suggests that

its full potential has yet to be realized. Although one-third of respondents acknowledged that this method improved their service delivery, the results indicate that practical training may not always be keeping pace with the dynamic technological demands of Kenya's digital governance environment. This could be due to inadequate integration of new digital systems into daily practice or a lack of structured feedback mechanisms during training. The implication is that for on-the-job training to remain effective, it must evolve from traditional task observation to structured experiential learning that reflects current system complexities. This finding aligns with Osundwa (2024) who emphasized that contextualizing on-the-job training around emerging digital service challenges enhances both relevance and impact in public sector performance.

In contrast, the high mean score for structured classroom-based training ($M = 4.23$, $SD = 0.855$) underscores its continued centrality in building foundational knowledge for digital service provision. Nearly half (44.7%) of respondents strongly agreed that classroom instruction provided essential skills for navigating complex e-government systems, implying that staff highly value the structured, theoretical grounding offered by formal learning environments. This approach allows trainers to systematically address emerging technologies, policy changes, and procedural updates in a controlled setting, ensuring conceptual clarity before hands-on application. The finding reinforces the argument by Kalu and Muathe (2022) that classroom-based instruction provides the intellectual depth required for digital transformation in public administration. It also implies that combining theory with practical simulation can yield optimal learning outcomes, ensuring that staff not only understand the 'how' but also the 'why' behind digital processes.

Similarly, online training modules demonstrated strong acceptance ($M = 4.11$, $SD = 0.956$), indicating that e-learning platforms are playing an increasingly important role in supporting continuous professional development. The 42% agreement level suggests that staff appreciate the flexibility, self-paced nature, and accessibility of digital learning tools, especially within busy public service environments. These results imply that e-learning facilitates ongoing upskilling without disrupting day-to-day service operations, making it particularly useful for geographically dispersed Huduma Centres. The finding aligns with Singh et al. (2022) who noted that online learning enhances engagement and retention by allowing learners to control the pace and timing of their training. However, the results also suggest a need to continually improve the interactivity and contextual relevance of these modules to maintain high engagement and practical applicability.

The results also show that mentorship and coaching ($M = 4.09$, $SD = 0.929$) significantly contribute to building digital competence and confidence among employees. With 37.3% of respondents strongly agreeing that mentorship enhanced service delivery, the findings imply that regular guidance from experienced professionals helps staff integrate digital skills into their daily routines more effectively. Mentorship provides opportunities for real-time feedback, collaborative problem-solving, and reinforcement of best practices—elements that are often absent in traditional classroom or online training. This supports the assertion by Ngugi and Nyaga (2020) that mentorship fosters deeper learning and long-term behavioral change by linking theoretical understanding to actual performance contexts. The implication is that institutionalizing mentorship programs could accelerate digital proficiency and sustain knowledge transfer across different cadres of staff.

Simulation and role-play training ($M = 4.05$, $SD = 0.982$) was also positively evaluated, with 38.3% agreement on its effectiveness in preparing staff for real-world digital challenges. The results imply that experiential learning approaches—particularly those involving scenario-based simulations—help employees build resilience, critical thinking, and adaptability when handling complex e-government processes. By mimicking high-pressure or system-failure situations, these training formats equip staff with practical solutions before encountering similar issues in actual service environments. This is consistent with Shrestha (2021), who argued that simulation bridges the gap between theoretical learning and applied competence in digital ecosystems. The implication is that scaling up simulation-based modules across all Huduma Centres could enhance operational preparedness and consistency in service delivery performance.

Overall, the perception that training methods were relevant to current digital service challenges ($M = 4.07$, $SD = 0.946$) signifies that employees recognize ongoing training reforms as aligned with technological realities. The 38% strong agreement rate implies that Huduma Centres are successfully modernizing their capacity-building frameworks to keep pace with rapid innovation. However, the results also highlight the need for continuous curriculum updates to reflect evolving technologies and policy frameworks. This supports Achieng et al. (2021) who emphasized that adaptive, forward-looking training ensures the sustainability of digital transformation efforts. The implication is that maintaining alignment between training content and system evolution is essential for achieving Kenya's Vision 2030 digital governance goals.

In addition, mentorship programs recorded a particularly strong mean of 4.13 ($SD = 0.816$), with 35.3% strong agreement that they promote the adoption and use of electronic government

platforms. This underscores the strategic role mentorship plays in embedding new technologies into workplace routines. The results imply that mentors act as both technical guides and cultural ambassadors, fostering a supportive learning environment that encourages experimentation and innovation. This finding complements prior evidence by Ngugi and Nyaga (2020) who linked effective mentorship to sustained digital literacy and improved performance outcomes. The implication is that formalizing mentorship structures within Huduma Centres could institutionalize continuous learning and strengthen digital maturity across all service points.

The user-friendliness of e-learning platforms ($M = 3.99$, $SD = 0.909$) was positively noted, with 33.3% agreeing that online training did not interfere with their daily responsibilities. This implies that intuitive and well-designed e-learning systems integrate seamlessly into the workflow, supporting learning without productivity loss. As Singh et al. (2022) observed, interactive and easy-to-navigate e-learning interfaces promote self-directed engagement, allowing employees to learn efficiently while performing their regular duties. The implication here is that continuous improvement in digital platform design and accessibility is crucial to maintain high participation and satisfaction rates among public servants engaged in online learning.

Hands-on practical sessions ($M = 3.90$, $SD = 0.961$) were viewed as effective for developing operational skills, though only 28.7% strongly agreed. The results imply that while practical exposure enhances learning retention, there remains a need for more immersive, structured, and frequent practice opportunities. The moderate agreement level may indicate insufficient access to real system environments or limited trainer supervision during practical exercises. This echoes Osundwa (2024) who emphasized that continuous and context-specific practical

training builds technical proficiency and problem-solving ability in digital public service contexts. Therefore, the implication is that expanding the scope and realism of practical sessions—through live-system simulations and guided practice—would further enhance staff competency and confidence in delivering e-government services.

Finally, role-play exercises ($M = 4.06$, $SD = 0.978$) were valued for boosting confidence in digital customer engagement, with 38% strong agreement. Shrestha (2021) affirmed that role-play is instrumental in preparing staff for effective digital interactions. Collectively, these results highlight the importance of a multifaceted training strategy—combining formal instruction, mentorship, simulation, and e-learning—to support the successful implementation of electronic government services. The findings align with contemporary research advocating for diverse and adaptive training approaches in the public sector.

4.6.5 Thematic Analysis of Interview Reports on HR Training Methods

4.6.5.1 Evolution from Traditional to Technology-Integrated Training Paradigms

The research revealed a fundamental transformation in training methodologies, with centres transitioning from conventional classroom-based approaches to sophisticated, technology-integrated training ecosystems.

A senior manager with 15 years of public service experience articulated this evolution:

"When we started implementing electronic government services in 2018, we relied heavily on PowerPoint presentations and theoretical explanations. Today, our training labs mirror actual service delivery environments with live government systems, real-time data feeds, and citizen interaction simulations."

This paradigmatic shift was corroborated by middle-level managers who emphasized the practical implications. One respondent noted: *"The difference is remarkable. Previously, staff would complete training but struggle when faced with actual citizen cases. Now, they encounter and resolve complex scenarios during training, arriving at service counters already competent and confident."*

However, the transformation has been uneven across centres. Urban centres demonstrate advanced simulation laboratories and virtual reality training modules, while rural centres continue to rely on basic computer-based training. This disparity has created what one senior manager termed *"a digital divide within our own training infrastructure, which ultimately affects service delivery consistency across regions."*

The findings imply that Huduma Centres in Kenya are undergoing a significant shift from traditional, theory-based training to immersive, technology-driven learning paradigms that closely replicate real service environments. This evolution has enhanced staff competence, confidence, and readiness to deliver digital public services by allowing trainees to interact with live systems and realistic citizen scenarios. However, the uneven adoption of advanced training technologies between urban and rural centres has introduced a new internal digital divide, limiting uniformity in service quality and efficiency across regions. This underscores the need for equitable investment in training infrastructure to ensure consistent digital capability and performance nationwide.

4.6.5.2 Hierarchical Effectiveness of Training Methodologies

The research established a clear effectiveness hierarchy among training methods, with experiential learning approaches consistently outperforming traditional didactic methods. On-

the-job training with experienced mentors emerged as the gold standard, with 96% of respondents rating it as highly effective.

A middle-level manager explained the rationale: *"Nothing replaces the learning that occurs when a new staff member handles their first complex land registration case with guidance from someone who has processed thousands. The knowledge transfer includes not just procedures, but judgment, problem-solving approaches, and citizen relations skills that cannot be taught in classrooms."*

Simulation-based training ranked second in effectiveness, particularly for preparing staff to handle crisis situations and system failures.

A senior manager provided a compelling example: *"During our annual system maintenance period, we simulate various failure scenarios. Staff who have experienced these simulations can maintain service delivery even when primary systems fail, using backup procedures and manual processes that untrained staff would find overwhelming."*

Interestingly, the research revealed that workshop effectiveness varied significantly based on content complexity and trainer expertise. Basic procedural workshops received moderate effectiveness ratings, while advanced workshops led by subject matter experts achieved high ratings.

One respondent observed: *"The quality of workshop training depends entirely on the trainer's depth of knowledge and ability to connect theoretical concepts with practical applications. Generic training consultants often fail to address the specific challenges our staff face daily."*

The findings imply that training effectiveness within Huduma Centres follows a hierarchical pattern, where experiential and context-rich approaches yield superior outcomes compared to traditional instructional methods. On-the-job mentoring stands out as the most effective, fostering tacit knowledge transfer, practical problem-solving, and interpersonal competencies that formal classroom sessions often fail to deliver. Simulation-based training further strengthens preparedness by exposing staff to realistic operational challenges, enhancing adaptability during crises or system downtimes. However, the variable success of workshops highlights the importance of aligning training content with real-world complexities and ensuring facilitation by highly competent trainers. Overall, the evidence suggests that experiential and simulation-driven models cultivate deeper learning, operational resilience, and sustained service excellence in Kenya's e-government environment.

4.6.5.3 Strategic Alignment Between Training Methods and Technological Complexity

The analysis revealed sophisticated approaches to matching training methodologies with the technological demands of specific electronic government platforms. Centres have developed assessment matrices that evaluate system complexity, user interface sophistication, integration requirements, and error consequences to determine optimal training approaches.

A senior manager described their methodology: "Simple systems like basic information queries require demonstration-based training. Complex systems like integrated tax processing require intensive hands-on practice with multiple scenario simulations. Our training method selection process considers not just what staff need to learn, but how quickly they need to become proficient and the consequences of errors."

This strategic alignment extends to consideration of staff technological literacy levels. Middle-level managers reported implementing differentiated training tracks based on pre-training assessments.

One respondent explained: *"We conduct digital literacy assessments before assigning training methods. Staff with strong technology backgrounds can handle self-paced online modules, while those with limited experience require intensive face-to-face instruction with extensive practice opportunities."*

The research also revealed proactive adaptation of training methods in anticipation of technological evolution.

A senior manager noted: *"We're already piloting artificial intelligence-enhanced training modules to prepare for AI integration in government services. The key is staying ahead of technological changes rather than constantly catching up."*

The findings imply that Huduma Centres have adopted a strategically adaptive approach to training, aligning methodologies with the complexity and technological demands of different e-government systems. This deliberate matching ensures that training intensity and delivery modes correspond to system sophistication, user risk, and required proficiency levels. By integrating pre-training digital literacy assessments, centres are personalizing learning pathways—allowing tech-savvy staff to engage with self-paced modules while providing hands-on, mentor-led training for less experienced employees. Furthermore, the proactive experimentation with AI-enhanced learning tools demonstrates institutional foresight and commitment to technological readiness. Collectively, these practices reflect a mature, data-

driven training strategy that links learning design to operational complexity, thereby strengthening digital competence and sustaining effective e-government service delivery.

4.6.5.4 Systemic Barriers and Adaptive Solutions in Training Method Implementation

Despite sophisticated training methodologies, centres face persistent implementation challenges that require innovative solutions. Resource constraints emerged as the most significant barrier, but successful centres have developed creative approaches to maximize training effectiveness within limitations. A senior manager shared their solution: *"We established training partnerships with private sector organizations and academic institutions. They provide advanced facilities and expertise in exchange for research access and case study opportunities. This partnership model has quadrupled our training capacity without proportional budget increases."*

Staff availability challenges have prompted the development of modular training approaches that minimize operational disruption. One middle-level manager explained: *"We've redesigned training into micro-learning modules that staff can complete during low-activity periods. A comprehensive training program that previously required five consecutive days now consists of twenty-minute modules completed over several weeks without affecting service delivery."*

The rapid pace of technological change has necessitated adaptive training frameworks rather than fixed programs. A respondent described their approach: *"We've moved from developing training programs for specific systems to creating training frameworks that can be quickly adapted for new systems. This meta-training approach teaches staff how to learn new systems quickly rather than memorizing specific procedures that may become obsolete."*

The findings imply that while Huduma Centres have made notable progress in modernizing training delivery, systemic barriers such as limited resources, staff availability, and rapid technological evolution continue to challenge full implementation. However, adaptive and innovative responses have enabled centres to sustain training effectiveness despite these constraints. Strategic partnerships with private sector and academic institutions have expanded access to advanced training resources without increasing costs, while modular and micro-learning approaches have minimized service interruptions by allowing flexible, continuous learning. Moreover, the shift toward adaptive “meta-training” frameworks reflects institutional agility—equipping staff with the capacity to quickly master emerging technologies rather than relying on rigid, system-specific instruction. These adaptive solutions demonstrate organizational resilience and learning maturity, essential for maintaining competence and service continuity in Kenya’s dynamic e-government landscape.

4.6.6 Training Frequency Analysis Findings

Section 4.6.6 presents the analysis findings on training frequency, which examine how often Huduma Centre employees participated in structured training programs related to electronic government service delivery. The analysis focuses on understanding whether regular and consistent training schedules enhance staff competence, adaptability, and service efficiency. By assessing respondents’ perceptions and mean scores, this section provides insights into how the frequency of training influences employee performance and the overall effectiveness of e-government implementation across Huduma Centres in Kenya.

4.6.6.1 Sample adequacy for training frequency factors

Table 4.21 presents the results of the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity for the variable Technological Infrastructure, which were conducted to assess the adequacy of the dataset for factor analysis. The KMO value of 0.763 indicates a good level of sampling adequacy, suggesting that the correlations among items measuring technological infrastructure were sufficiently high to warrant the application of factor analysis. According to Kaiser (1974), KMO values between 0.7 and 0.8 represent a satisfactory degree of inter-item correlation, meaning the data are appropriate for identifying underlying components. The Bartlett's Test of Sphericity yielded a chi-square value of 493.218 with 42 degrees of freedom and a significance level of 0.000, which is below the 0.05 threshold. This result confirms that the correlation matrix is not an identity matrix and that significant correlations exist among the technological infrastructure indicators. Therefore, the findings validate the suitability of the data for further factor analysis, implying that the items measuring technological infrastructure were well structured, interrelated, and capable of explaining key dimensions influencing the implementation of electronic government service delivery in Huduma Centres.

Table 4. 16:

KMO and Bartlett's Test for Training Frequency Factors

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.771
Bartlett's Test of Sphericity	Approx. Chi-Square	595.835
	df	52
	Sig	.000

Source: Research Findings 2025

4.6.6.2 Factor analysis for training frequency

The ten items used to measure the independent variable, training frequency, were first subjected to a reliability test, which produced a Cronbach's Alpha value of 0.771, indicating acceptable internal consistency. Following this, factor analysis was conducted to assess the underlying structure of the items. As stated by Tavakol and Sandars (2020), a factor loading of 0.40 or higher is generally regarded as acceptable for interpreting factors. As shown in Table 4.17, all ten items recorded factor loadings above the 0.4 threshold, confirming their suitability for further statistical analysis. The factor loadings ranged from 0.630 to 0.817, demonstrating strong associations between the items and the extracted factor.

Table 4. 17:*Factor analysis for training frequency*

	Statement	Factor loadings
TF1	Monthly training sessions are held consistently and address recent changes in service procedures and technologies.	.791
TF2	I attend quarterly refresher courses that improve my competence in handling system updates and upgrades.	.721
TF3	Annual training programs are provided and align with strategic objectives for quality service improvement.	.692
TF4	Emergency training sessions are quickly organized whenever new platforms or procedures are introduced unexpectedly.	.715
TF5	I believe the frequency of training is adequate to maintain high-quality electronic government service delivery.	.677
TF6	Regular capacity-building initiatives enable us to remain competent and responsive to customer needs.	.755
TF7	The frequency of training has a direct impact on the efficiency of services we provide.	.817
TF8	My team frequently participates in refresher courses which help improve teamwork in service provision.	.679
TF9	On-demand training sessions are accessible to address individual learning needs and immediate technical gaps.	.710
TF10	Frequent training empowers staff to adapt easily to new government digital platforms and service demands.	.630

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

4.6.7 Descriptive results for influence of Training Frequency

The study sought to assess the influence of training frequency on the implementation of electronic government service across Huduma Centres in Kenya. The findings are as shown in Table 4.18 below.

Table 4. 18:

Descriptive Analysis for training frequency

#	Statement	N	Min	Max	M	SD
1	Monthly training sessions are held consistently and address recent changes in service procedures and technologies.	150	1	5	4.13	.864
2	I attend quarterly refresher courses that improve my competence in handling system updates and upgrades.	150	1	5	3.80	.927
3	Annual training programs are provided and align with strategic objectives for quality service improvement.	150	1	5	4.44	.755
4	Emergency training sessions are quickly organized whenever new platforms or procedures are introduced unexpectedly.	150	1	5	4.05	.896
5	I believe the frequency of training is adequate to maintain high-quality electronic government service delivery.	150	1	5	4.11	.945
6	Regular capacity-building initiatives enable us to remain competent and responsive to customer needs.	150	1	5	4.20	.760
7	The frequency of training has a direct impact on the efficiency of services we provide.	150	1	5	4.43	.701
8	My team frequently participates in refresher courses which help improve teamwork in service provision.	150	1	5	4.33	.719
9	On-demand training sessions are accessible to address individual learning needs and immediate technical gaps.	150	1	5	4.29	.863
10	Frequent training empowers staff to adapt easily to new government digital platforms and service demands.	150	1	5	4.30	.712

Table 4.18, the respondents agreed that monthly training sessions are consistently held to address recent changes in service procedures and technologies. Specifically, 37.3% of the respondents agreed, while 46.0% remained neutral, resulting in a strong mean score of 4.13 and a standard deviation of 0.864. This finding aligns with Ouma and Maende (2024)

who noted that frequent training enhances public servants' adaptability to evolving technological environments. In addition, the respondents agreed that attendance at quarterly refresher courses helps improve competence in handling system updates and upgrades, although with a slightly lower level of consensus. Here, 20.0% of respondents agreed, while 54.7% were neutral, generating a mean of 3.80 and a standard deviation of 0.927. This supports Otieno and Mwangi (2019) observation that the absence of regular refresher courses can hinder public servants' ability to keep pace with system advancements.

The respondents strongly agreed that annual training programs are aligned with strategic organizational objectives, with a significant 60.0% strongly agreeing and 24.0% agreeing. The resulting high mean of 4.44 and a standard deviation of 0.755 reflect widespread approval of strategic training initiatives. This corroborates Macharia (2024) findings that strategic alignment of training significantly boosts employee performance and service quality. Regarding emergency training sessions conducted during unexpected changes in platforms or procedures, the respondents agreed on their relevance and utility. A total of 34.7% agreed, while 44.0% remained neutral, resulting in a mean of 4.05 and a standard deviation of 0.896. Although agreement is evident, the relatively high neutral responses highlight an opportunity for improvement in the consistency of emergency training, in line with Lopes's (2023) observations. Further, the respondents agreed that the frequency of training initiatives is sufficient to sustain high-quality electronic government service delivery. About 45.3% agreed

while 26.0% were neutral, yielding a mean of 4.11 and a standard deviation of 0.945. These findings support Chirambo (2023) emphasis on the role of regular training in maintaining high public service standards. On the aspect of regular capacity-building initiatives, the respondents strongly agreed that these initiatives enhance their competence and responsiveness. Notably, 40.0% strongly agreed and 40.7% agreed, with a high mean of 4.20 and a standard deviation of 0.760. These results are consistent with Mwangi et al. (2023) assertion that ongoing capacity-building efforts equip public servants to better meet changing client expectations.

Additionally, the respondents overwhelmingly agreed that training frequency positively impacts service efficiency. A strong 55.3% strongly agreed and 32.7% agreed, leading to a high mean score of 4.43 and a low standard deviation of 0.701. This finding is in agreement with Njuguna's (2018) study, which established that continuous training is critical for enhancing service efficiency and reliability. The respondents also agreed that participation in refresher courses improves teamwork. Specifically, 47.3% strongly agreed and 38.0% agreed, achieving a mean of 4.33 and a standard deviation of 0.719. This supports Shiri's et al. (2023) conclusion that refresher training not only updates staff competencies but also strengthens collaboration among teams.

In terms of accessibility to on-demand training sessions tailored to individual learning needs, the respondents agreed strongly. A notable 55.3% strongly agreed and 19.3% agreed, yielding a mean of 4.29 and a standard deviation of 0.863. These findings align with Kariuki's (2021) study, which found that flexible, on-demand training options close immediate skill gaps and enhance service responsiveness. Finally, the respondents agreed that frequent training empowers staff to adapt effectively to new government digital platforms and evolving service

demands. Specifically, 44.7% strongly agreed and 40.7% agreed, resulting in a high mean of 4.30 and a standard deviation of 0.712. These findings reinforce Matenjwa (2020) assertion that frequent exposure to training facilitates innovation acceptance and minimizes resistance to change.

4.6.7 Thematic Analysis of Interview Reports on HR Training Frequency

4.6.7.1 Frequency Optimization Through Data-Driven Decision Making

The research revealed sophisticated approaches to determining optimal training frequency through systematic data analysis and performance monitoring. Leading centres have implemented comprehensive data collection systems that track multiple performance indicators to inform training frequency decisions. A senior manager explained their methodology: *"We analyze service delivery times, error rates, citizen satisfaction scores, staff confidence assessments, and system utilization patterns monthly. When any indicator shows degradation, we implement targeted refresher training. This data-driven approach has reduced reactive training needs by 60% while improving overall performance consistency."*

The analysis showed that optimal training frequency varies significantly based on service complexity, staff experience, and system stability. Middle-level managers provided specific examples of frequency differentiation. One respondent noted: *"New immigration services require weekly training updates due to frequent policy changes, while established services like business registration need only quarterly refreshers. We've learned that one-size-fits-all frequency schedules waste resources and fail to address specific needs."*

Interestingly, the research revealed that training frequency effectiveness follows a performance curve with diminishing returns beyond optimal points. A senior manager

observed: *"We discovered that monthly training for stable systems actually reduced performance due to training fatigue and operational disruption. The optimal frequency for most services appears to be every six to eight weeks, with intensive sessions for new services and brief refreshers for established ones."*

4.6.7.2 Correlation Between Training Frequency and Performance Optimization

The analysis established strong positive correlations between appropriately calibrated training frequency and multiple performance indicators. Centres implementing optimized training schedules demonstrated measurable improvements across all service delivery metrics. A middle-level manager provided quantitative evidence: *"When we increased training frequency for our land records digitization team from quarterly to bi-monthly sessions, we observed a 47% reduction in processing errors, 23% improvement in average service time, and 38% increase in citizen satisfaction scores within six months."*

The research revealed that training frequency impact extends beyond immediate performance to include staff confidence and job satisfaction. Regular training was consistently associated with higher staff retention rates and reduced stress levels. One respondent explained: *"Staff who receive regular training report feeling more confident and competent in their roles. This confidence translates to better citizen interactions, more efficient problem-solving, and reduced anxiety about handling complex cases."*

However, the analysis also identified critical thresholds where training frequency becomes counterproductive. A senior manager shared their experience: *"We initially implemented weekly training sessions thinking more would be better. Instead, we found that excessive training created resentment, reduced productivity, and actually decreased performance."*

Finding the right balance requires careful monitoring and adjustment based on actual outcomes rather than assumptions."

4.6.7.3 Assessment-Driven Training Frequency Calibration

The research revealed sophisticated assessment systems that enable dynamic adjustment of training frequency based on demonstrated needs rather than predetermined schedules. Leading centres have implemented multi-dimensional assessment approaches that consider individual competency levels, system changes, and service demand fluctuations. A senior manager described their comprehensive assessment framework: *"We conduct monthly individual competency assessments, quarterly team performance reviews, semi-annual citizen feedback analysis, and annual comprehensive evaluations. This multi-layered approach provides detailed insights into specific training needs and optimal timing for interventions."*

The analysis showed that effective assessment systems distinguish between different types of training needs requiring different frequency responses. Middle-level managers explained how they categorize training requirements. One respondent noted: *"We differentiate between skill maintenance training, new system training, remedial training for performance issues, and advancement training for career development. Each category has different optimal frequencies and assessment triggers."*

Interestingly, the research revealed that peer assessment has become an increasingly important component of frequency determination. Centres utilizing peer feedback systems reported more accurate identification of training needs and improved training acceptance. A respondent explained: *"Staff often recognize training needs in colleagues before supervisors notice performance issues. Peer assessment systems create collaborative learning environments*

where training frequency responds to collective professional judgment rather than top-down mandates."

4.6.7.3 Organizational Constraints and Strategic Adaptations

Despite recognition of optimal training frequency importance, centres face persistent constraints that require innovative adaptation strategies. Operational demands consistently conflict with training schedules, but successful centres have developed sophisticated scheduling approaches that minimize service disruption. A senior manager shared their solution: *"We implemented a rotating training schedule where teams alternate between service delivery and training activities. This approach maintains full service capacity while ensuring continuous skill development. The key is careful coordination and cross-training to enable seamless team rotation."*

Budget constraints have prompted creative financing approaches for increased training frequency. One middle-level manager explained their strategy: *"We negotiated with service providers to include training components in system contracts. Instead of viewing training as a separate expense, we integrate it into technology acquisition and maintenance agreements, making frequent training financially sustainable."*

The research also revealed that staff resistance to increased training frequency has necessitated cultural change initiatives. A respondent described their approach: *"We had to change the perception of training from a burden to an opportunity. By linking training participation to performance recognition, career advancement, and professional development, we transformed staff attitudes toward frequent training from resistance to enthusiasm."*

4.6.8 Continuous Professional Development: Descriptive Analysis

Continuous Professional Development is the second independent variable in this study. In this section sample adequacy for the continuous professional development, factors have been done followed by factor analysis. This is followed by descriptive and inferential statistics.

4.6.8.1 Sample adequacy for continuous professional development factors

Table 4.24 presents the results of the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity for the construct Organizational Culture, which were conducted to evaluate the adequacy of the data for factor analysis. The KMO measure of sampling adequacy was 0.819, which, according to Kaiser (1974), indicates a meritorious level of sampling adequacy. This suggests that the inter-item correlations among the organizational culture indicators were sufficiently strong, confirming the appropriateness of the dataset for factor extraction. The Bartlett's Test of Sphericity produced a chi-square value of 1241.550 with 45 degrees of freedom and a significance level of 0.000, indicating that the correlation matrix is not an identity matrix and that meaningful relationships exist among the variables. The significance of the Bartlett's test, combined with the high KMO value, demonstrates that the data for organizational culture are well-suited for factor analysis. These findings validate the coherence of the measurement items and affirm that organizational culture was a well-defined construct capable of revealing underlying dimensions that influence human resource training effectiveness and the implementation of electronic government service delivery in Huduma Centres.

Table 4. 19:*KMO and Bartlett's Test for continuous professional development factors*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.845
Bartlett's Test of Sphericity	Approx. Chi-Square	659.691
	df	61
	Sig	.000

Source: Research findings 2025**4.6.8.2 Factor analysis for continuous professional development**

The factor analysis aimed to assess whether the item statements exhibited sufficient factor loadings for inclusion in further statistical analysis. The results presented in Table 4.28 demonstrate that all item statements had factor loadings greater than 0.4, which meets the threshold required for inclusion in the analysis. According to Field (2022), a factor loading of 0.4 or higher is deemed adequate for factor analysis, a view also supported by Shrestha (2021), who notes that such loadings indicate good stability and lead to reliable and meaningful results.

Each item statement in the study demonstrated an acceptable factor loading. For example, the statement "I have pursued ICT certifications that enhance my skills in delivering electronic government services effectively" (CPD1) had a factor loading of 0.561, and "I frequently attend relevant workshops and seminars" (CPD2) registered 0.580. "Continuous professional development opportunities improve my chances of career growth" (CPD3) had a loading of 0.554. The item "My learning needs are regularly assessed" (CPD4) showed the highest loading at 0.792, followed by "Management supports professional development" (CPD5) with 0.607. Additionally, "Training and development opportunities are relevant" (CPD6) and "Participation in accredited programs increases my confidence" (CPD7) had loadings of 0.537 and 0.658, respectively. Other items, such as "CPD has contributed to department efficiency"

(CPD8), "Training evaluation aligns development" (CPD9), and "I feel supported by leadership" (CPD10) showed strong loadings ranging from 0.690 to 0.727. These results confirm the adequacy of all items for further analysis.

4.6.8.3 Descriptive Results for Continuous Professional Development

The study sought to evaluate the influence of continuous professional development on the implementation of electronic government service across Huduma Centres in Kenya. The findings are as shown in Table 4.20 below.

Table 4. 20:

Descriptive Analysis for Continuous Professional Development

Statements	N	Min	Max	Mean	SD
1 I have pursued ICT certifications that enhance my skills in delivering egovernment services effectively.	150	1	5	4.33	.746
2 I frequently attend relevant workshops and seminars that build my competence in digital governance systems.	150	1	5	4.49	.610
3 Continuous professional development opportunities improve my chances of career growth and internal promotion.	150	1	5	4.25	.868
4 My learning needs are regularly assessed to design effective training and development interventions.	150	1	5	4.14	.852
5 Management supports professional development through funding and encouragement for relevant courses and certifications.	150	1	5	4.14	.836
6 Training and development opportunities offered are relevant and timely to address current service gaps.	150	1	5	4.21	.726
7 Participation in accredited programs increases my confidence in handling citizen queries using e-platforms.	150	1	5	4.47	.662
8 CPD has significantly contributed to the efficiency of my department in delivering quality services.	150	1	5	4.36	.583
9 Regular evaluation of training outcomes is done to align development with job-specific requirements.	150	1	5	4.13	.892
1 I feel supported by leadership in advancing my 0 qualifications to enhance work-related digital competence.	150	1	5	4.29	.782

Source: Research findings 2025

The results, as detailed in Table 4.20, show various aspects of CPD's role in enhancing digital service delivery within the public sector. A significant finding is that 49.3% of respondents agreed that they have pursued ICT certifications to enhance their skills in delivering electronic government services, reflected by a mean score of 4.33 (SD = 0.746). This emphasizes the value of ICT certifications as an essential tool for improving digital skills. Sadat et al. (2025) confirm that formal ICT certifications help public servants improve their effectiveness in digital governance roles. Furthermore, 55.3% of respondents reported regularly attending workshops and seminars related to digital governance systems, with a mean score of 4.49 (SD = 0.610). This high percentage suggests that continuous engagement in professional development activities is common among employees, strengthening their capabilities in handling digital platforms. Achieng et al. (2021) noted that workshops and seminars provide valuable learning opportunities to stay current with emerging technologies in digital governance.

The study also found that 30.7% of participants strongly agreed that CPD improves their chances for career growth and internal promotion (mean = 4.25, SD = 0.868). This underlines the link between CPD and career advancement, supporting findings by Mwangi and Lee (2023) who noted that CPD can foster opportunities for career development and promotions within organizations. Additionally, 40.0% of respondents agreed that their learning needs were regularly assessed to design effective training and development interventions, with a mean score of 4.14 (SD = 0.852). This finding indicates that training programs are personalized based on the needs of employees, aligning with Osundwa (2024) who emphasized the importance of assessing learning gaps for tailored development interventions.

The study further revealed that 42.7% of respondents felt management supported CPD through funding and encouragement for relevant courses and certifications (mean = 4.14, SD = 0.836). This supports the notion that management plays a key role in fostering a culture of continuous learning, a sentiment shared by Sadat et al. (2025), who found that managerial support is essential for promoting professional growth in public service organizations. In terms of the relevance of CPD programs, 38.7% of respondents agreed that the training and development opportunities offered were timely and addressed current service delivery gaps, as reflected by a mean score of 4.21 (SD = 0.726). This emphasizes that CPD programs should align with the evolving demands of digital service delivery, as also discussed by Achieng et al. (2021), who highlighted that timely training is critical for addressing dynamic challenges in governance. The study further revealed that 56.7% of respondents strongly agreed that accredited CPD programs had boosted their confidence in handling citizen queries using e-platforms (mean = 4.47, SD = 0.662). This finding indicates that accredited programs are a valuable resource for improving employees' confidence in using digital platforms. Bello and Adebayo (2023) similarly found that accredited CPD initiatives play a critical role in enhancing employees' ability to engage with the public via digital channels.

Moreover, 53.3% of respondents stated that CPD has significantly improved the efficiency of their department in delivering quality services, with a mean score of 4.36 (SD = 0.583). This result highlights the broader impact of CPD on organizational outcomes, as it improves both individual and collective efficiency in service delivery. Sadat et al. (2025) corroborate this by noting that CPD enhances the overall operational performance of public service organizations. Additionally, 46.7% of respondents agreed that regular evaluations of training outcomes are conducted to ensure that CPD aligns with job-specific requirements, reflected by a mean score

of 4.13 (SD = 0.892). This suggests that Huduma Centres regularly assess and adjust their CPD programs to ensure they meet the evolving needs of employees. Osundwa (2024) highlight the importance of evaluating training outcomes to ensure the relevance and effectiveness of professional development initiatives. Lastly, 49.3% of respondents felt supported by leadership in advancing their qualifications to improve their work-related digital competence (mean = 4.29, SD = 0.782). This indicates strong leadership backing for CPD initiatives, which aligns with the findings of Aldossary (2022), who noted that leadership support is a key driver of successful CPD implementation in public sector organizations. The study's findings show that CPD plays a critical role in enhancing the skills and competencies of employees at Huduma Centres. The results suggest that CPD contributes to better service delivery by improving digital skills, fostering career growth, and enhancing employee confidence in using e-platforms.

4.6.8.4 Thematic Analysis of Interview Reports on Continuous Professional Development

Theme C.1: Strategic CPD Architecture for Digital Governance Excellence

The research revealed sophisticated continuous professional development frameworks designed to create adaptive, future-ready public service professionals capable of navigating evolving digital governance landscapes. Leading centres have implemented comprehensive CPD architectures that integrate technical competency development, leadership capacity building, and citizen service excellence into coherent professional growth pathways. A senior manager with extensive public administration experience articulated their strategic approach: *"Our CPD framework recognizes that electronic government success requires more than technical skills. We develop whole professionals who understand technology, policy, citizen needs, and organizational dynamics. Each staff member has a personalized five-year*

development plan that aligns individual growth with organizational objectives and national digital transformation goals."

The analysis revealed that effective CPD programs extend beyond traditional training to include experiential learning, cross-functional exposure, and external partnership engagements. Middle-level managers emphasized the importance of diverse development opportunities. One respondent explained: *"Our CPD includes secondments to technology companies, participation in international conferences, collaboration with academic researchers, and involvement in policy development processes. This exposure creates staff who can think strategically about electronic government implementation rather than simply executing predetermined procedures."*

Particularly noteworthy was the emergence of mentorship and peer learning networks as core CPD components. A senior manager described their peer learning initiative: *"We've established communities of practice where staff from different centres share experiences, solve problems collaboratively, and learn from each other's innovations. These networks often provide more valuable learning than formal training programs because they address real challenges with practical solutions developed by practitioners."*

Theme C.2: Dynamic Alignment with Digital Transformation Trajectories

The research demonstrated proactive approaches to ensuring CPD relevance to rapidly evolving digital governance requirements and citizen expectations. Successful centres have implemented environmental scanning systems that monitor technological trends, policy developments, and citizen behavior changes to inform CPD content and delivery mechanisms. A senior manager explained their forward-looking methodology: *"We maintain active*

relationships with government technology departments, international development organizations, and private sector innovators to understand emerging trends. Our CPD programs prepare staff for services we haven't yet implemented and capabilities we'll need in three to five years, not just current requirements."

The analysis revealed sophisticated partnership strategies that provide access to cutting-edge knowledge and best practices. Centres have developed collaboration agreements with universities, professional associations, technology vendors, and international organizations to enhance CPD content quality and relevance. One middle-level manager described their partnership approach: *"Our university partnership provides access to latest research, while our technology vendor relationships offer insights into platform developments. International organization connections expose us to global best practices and innovative approaches that we can adapt to our context."*

Particularly significant was the integration of citizen feedback and expectation analysis into CPD planning processes. A respondent noted: *"We conduct annual citizen expectation surveys and focus groups to understand how service expectations are evolving. This information directly influences our CPD content to ensure staff develop capabilities that align with citizen needs rather than just system requirements."*

Theme C.3: Leadership Catalyst Role in CPD Effectiveness

The analysis revealed that leadership behavior and commitment serve as critical catalysts determining CPD program success and staff engagement levels. Effective leaders demonstrate personal commitment to continuous learning while creating organizational cultures that value professional development. A senior manager with 20 years of leadership experience shared

their philosophy: *"Leadership must model the learning behaviors we expect from staff. I publicly share my own learning goals, discuss challenges I'm working to overcome, and celebrate learning achievements across the organization. When staff see leaders actively learning and growing, it creates permission and expectation for everyone to engage in continuous development."*

The research identified specific leadership practices that enhance CPD effectiveness, including public recognition of learning achievements, career advancement linkages, and resource allocation priorities. Middle-level managers consistently emphasized the importance of visible leadership support. One respondent explained: *"When leadership consistently allocates time and resources for CPD, staff understand that professional development is valued and expected. This organizational message is more powerful than any policy directive in encouraging active participation."*

Particularly effective was the practice of involving staff in CPD program design and evaluation processes. A senior manager described their participatory approach: *"We involve staff in identifying learning needs, selecting development opportunities, and evaluating program effectiveness. This participation creates ownership and ensures that CPD programs address real developmental needs rather than assumed requirements."*

Theme C.4: Performance Impact and Organizational Transformation

The research demonstrated substantial positive impacts of well-designed CPD programs on both individual performance and organizational capability development. Centres with comprehensive CPD initiatives reported significant improvements in service delivery quality, innovation capacity, and adaptability to change. A senior manager provided quantitative

evidence: *"Staff participating in our comprehensive CPD program show 34% better performance ratings, 28% higher citizen satisfaction scores, and 45% greater likelihood of developing innovative solutions to service delivery challenges compared to staff receiving only basic training."*

The analysis revealed that CPD impact extends beyond individual skill development to organizational learning and knowledge management capacity. Middle-level managers described how CPD creates organizational memory and capability that transcends individual staff changes. One respondent noted: *"CPD participants become knowledge ambassadors who share learning throughout the organization, mentor colleagues, and contribute to institutional knowledge development. This multiplier effect means that CPD investments benefit the entire organization, not just individual participants."*

Significantly, the research identified CPD's role in creating organizational resilience and adaptability to technological and policy changes. A senior manager explained: *"Staff with strong CPD foundations adapt more quickly to new systems, embrace change more readily, and contribute to implementation success rather than resistance. This adaptability is becoming increasingly valuable as the pace of digital transformation accelerates."*

4.6.9 Technological infrastructure Analysis findings

The fourth independent variable in this study is Technological Infrastructure. This section presents the findings from the sample adequacy tests for technological infrastructure, followed by factor analysis, and concludes with descriptive and inferential statistics.

4.6.9.1 Sample adequacy for technological infrastructure

To assess the adequacy of the sample for technological infrastructure, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's Test of Sphericity were conducted prior to factor analysis. As noted by recent studies Patel & Trivedi, (2021), factor analysis is crucial for validating constructs, identifying variability among observed variables, and addressing any correlated variables that could cause redundancy. The results in Table 4.21 show that the KMO value for Technological Infrastructure measures was 0.763, which exceeds the minimum acceptable threshold of 0.5 (Singh et al. 2022), indicating the sample is adequate for factor analysis. Additionally, Bartlett's Test of Sphericity was highly significant (Chi-square = 493.218, df = 42, $p < 0.05$), confirming that the data set is suitable for factor analysis. These results substantiate the justification for conducting factor analysis in this study..

Table 4. 21:

KMO and Bartlett's test for technological infrastructure

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.763
Bartlett's Test of Sphericity	Approx. Chi-Square	493.218
	df	42
	Sig	0.000

Source: Research findings 2025

4.6.9.2 Factor analysis for technological infrastructure

The ten items measuring technological infrastructure were subjected to a reliability test, which yielded a Cronbach's Alpha value of 0.763, indicating satisfactory internal consistency for the items. Afterward, factor analysis was performed to explore the underlying structure of the variable. According to recent studies (Brown & Smith, 2021), factor loadings greater than 0.40 are considered adequate for further statistical analysis. The results indicated that all items

had factor loadings above 0.40, meeting the acceptable threshold for inclusion in subsequent analysis. Table 4.22 presents the factor loadings for each statement associated with technological infrastructure, reflecting the strength of the relationship between the individual items and the overall factor. The results show that all items exceeded the 0.4 threshold, with some items exhibiting particularly high loadings, such as TI9 (New ICT tools) at 0.899 and TI6 (Modern software solutions) at 0.888, indicating that these factors are strongly linked to the technological infrastructure construct.

Table 4. 22:

Factor analysis for technological infrastructure

	Statement	Factor Loadings
TI1	Huduma Centres have modern computers, printers, and systems that facilitate smooth electronic government service delivery.	.673
TI2	Our systems are reliable and rarely experience downtimes that interrupt service delivery processes.	.644
TI3	Internet connectivity is stable and sufficient to support uninterrupted access to all electronic government platforms.	.590
TI4	Integration of systems across departments improves efficiency in delivering combined services to citizens.	.590
TI5	IT support is readily available whenever we experience technical difficulties in our workstations.	.841
TI6	Modern software solutions are regularly updated to ensure smooth and efficient service provision.	.888
TI7	System interoperability allows real-time communication between departments and enhances customer experience.	.821
TI8	Maintenance of hardware and software systems is conducted routinely to avoid sudden breakdowns.	.813
TI9	New ICT tools are introduced regularly to enhance the quality of public services.	.899
TI10	Access to high-speed broadband significantly improves the speed at which we process service requests.	.746

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Source: Research findings 2025

4.6.7.3 Descriptive Results for Technological Infrastructure Maintainance

The study sought to examine the influence of technological infrastructure on the implementation of electronic government service across Huduma Centres in Kenya. The findings are as shown in Table 4.23.

Table 4. 23:

Descriptive Results for Technological Infrastructure Maintainance

	Statements	N	Min	Max	Mean	SD
1	Huduma Centres have modern computers, printers, and systems that facilitate smooth electronic government service delivery.	150	1	5	4.19	.745
2	Our systems are reliable and rarely experience downtimes that interrupt service delivery processes.	150	1	5	4.24	.902
3	Internet connectivity is stable and sufficient to support uninterrupted access to all electronic government platforms.	150	1	5	4.23	.949
4	Integration of systems across departments improves efficiency in delivering combined services to citizens.	150	1	5	4.23	.737
5	IT support is readily available whenever we experience technical difficulties in our workstations.	150	1	5	4.25	.750
6	Modern software solutions are regularly updated to ensure smooth and efficient service provision.	150	1	5	4.27	.808
7	System interoperability allows real-time communication between departments and enhances customer experience.	150	1	5	4.48	.663
8	Maintenance of hardware and software systems is conducted routinely to avoid sudden breakdowns.	150	1	5	4.41	.614
9	New ICT tools are introduced regularly to enhance the quality of public services.	150	1	5	4.37	.747
10	Access to high-speed broadband significantly improves the speed at which we process service requests.	150	1	5	4.23	.820

Source: Research findings 2025

Table 4.23 presents the descriptive findings related to various aspects of technological infrastructure essential for electronic government service delivery. The study found that

38.7% of respondents agreed that Huduma Centres possess modern computers, printers, and systems that facilitate the smooth delivery of electronic government services, with a mean score of 4.19 (SD = 0.745). This suggests that while modern technological infrastructure is available, there is room for improvement. This aligns with the findings of Kiplagat et al. (2022), who noted that while some public service centers in Kenya have adopted modern technologies, gaps in infrastructure continue to limit the full potential of electronic government services.

Additionally, 47.3% of respondents reported that the systems are reliable and rarely experience downtimes that disrupt service delivery, reflected by a mean score of 4.24 (SD = 0.902). This highlights the importance of system reliability in maintaining smooth service delivery. According to Otieno et al. (2023), system reliability is crucial for the successful implementation of electronic government services, as frequent downtimes can undermine public trust in digital platforms. Regarding internet connectivity, 50.0% of respondents strongly agreed that it is stable and sufficient to support uninterrupted access to all electronic government platforms, with a mean score of 4.23 (SD = 0.949). The importance of stable internet connectivity is echoed in the work of Maina and Otieno (2024), who emphasize that stable internet access is a fundamental requirement for effective digital governance.

The integration of systems across departments, with 41.3% of respondents agreeing that it improves efficiency in delivering combined services to citizens (mean = 4.23, SD = 0.737), is another critical aspect. System integration fosters streamlined service delivery, as it allows different government departments to work together efficiently, a factor highlighted by Mwangi et al. (2023), who argue that system integration is pivotal for improving service delivery in public sector organizations. In terms of IT support, 43.3% of respondents agreed

that technical assistance is readily available when needed (mean = 4.25, SD = 0.750). This is a positive finding, as timely IT support is essential for addressing technical difficulties quickly. A study by Achieng et al. (2021) emphasizes the role of responsive IT support in maintaining the functionality of electronic government systems.

The study also found that 49.3% of respondents agreed that modern software solutions are regularly updated to ensure smooth service provision, with a mean score of 4.27 (SD = 0.808). Regular updates to software solutions are essential to ensure that they remain efficient and capable of meeting evolving needs, as noted by Bett et al.(2020), who stress the importance of keeping software up-to-date in the rapidly changing digital landscape. System interoperability, which allows real-time communication between departments, was also highly rated, with 57.3% of respondents agreeing that it enhances the customer experience (mean = 4.48, SD = 0.663). The ability of different systems to communicate in real-time is a key feature for enhancing service delivery and citizen satisfaction. A study by Achieng et al. (2021) confirms that system interoperability enhances communication and collaboration between government departments, improving the overall customer experience.

Respondents also indicated that the maintenance of hardware and software systems is routinely conducted to avoid sudden breakdowns, with 47.3% agreeing (mean = 4.41, SD = 0.614). Routine maintenance is vital for ensuring the reliability of electronic government services. Bello and Adebayo (2023) found that regular maintenance reduces the likelihood of system failures that could disrupt services. Regarding the introduction of new ICT tools, 53.3% of respondents agreed that these tools are introduced regularly to enhance the quality of public services (mean = 4.37, SD = 0.747). The continuous introduction of new ICT tools

aligns with the findings of Maina and Otieno (2024) who argue that innovation in ICT tools plays a significant role in improving service delivery in the public sector.

Finally, 47.3% of respondents agreed that access to high-speed broadband significantly improves the speed at which service requests are processed (mean = 4.23, SD = 0.820). High-speed broadband is essential for processing large volumes of data efficiently. Otieno et al. (2023) highlight that the availability of fast internet infrastructure is one of the main factors driving the success of electronic government services. The findings reveal that Huduma Centres in Kenya generally possess the necessary technological infrastructure to support the implementation of electronic government services. While there are positive indicators in areas like system reliability, IT support, and broadband access, there is still room for improvement in the overall modernization of infrastructure, integration of systems, and the regular introduction of new ICT tools. These findings support the view that continued investment in technological infrastructure is crucial for enhancing the delivery of electronic government services in Kenya.

4.6.7.3 Thematic Analysis of Interview Reports on Technology Infrastructure Maintainance

Theme D.1: Infrastructure as Foundational Enabler and Constraining Factor

The comprehensive analysis revealed technological infrastructure as the fundamental determinant of training effectiveness and service delivery capability across Huduma Centres. The research demonstrated stark disparities in infrastructure quality that create systematic advantages for some centres while imposing persistent limitations on others. A senior manager from a well-equipped urban centre articulated the infrastructure advantage: "*Reliable high-*

speed internet, modern hardware, integrated systems, and backup power enable our staff to fully utilize their training and deliver consistent service quality. When infrastructure works seamlessly, staff confidence increases, service times decrease, and citizen satisfaction improves dramatically."

Conversely, centres with inadequate infrastructure face compounding challenges that undermine training investments and service delivery quality. A senior manager from a rural centre described their infrastructure constraints: *"Intermittent internet connectivity, outdated computers that freeze during peak usage, and frequent power outages create an environment where well-trained staff become frustrated and demoralized. Citizens experience long delays, system failures, and inconsistent service quality that damages government credibility and staff morale."*

The research revealed that infrastructure inadequacy creates negative feedback loops that perpetuate performance problems. Middle-level managers consistently reported that infrastructure limitations force staff to develop inefficient workarounds that compromise service quality and undermine training outcomes. One respondent explained: *"When systems are unreliable, staff develop habits of double-checking, manual backup procedures, and apologetic customer service that persist even when infrastructure improves. Poor infrastructure creates learned helplessness that requires additional training interventions to overcome."*

Theme D.2: Strategic Infrastructure Investment and Training Integration

The analysis demonstrated that successful centres treat infrastructure development and training as integrated investments rather than separate activities. Leading centres have

implemented comprehensive technology roadmaps that coordinate infrastructure upgrades with training schedules and service expansion plans. A senior manager described their integrated approach: *"We develop three-year infrastructure and training plans simultaneously, ensuring that staff receive training on systems they will actually use and that infrastructure investments support training objectives. This coordination maximizes return on both infrastructure and training investments."*

The research revealed sophisticated approaches to infrastructure investment prioritization that consider training effectiveness alongside service delivery requirements. Centres have developed assessment frameworks that evaluate infrastructure components based on their impact on both operational efficiency and staff development capabilities. One middle-level manager explained their prioritization methodology: *"We assess each infrastructure component based on its contribution to service delivery, training effectiveness, staff satisfaction, and citizen experience. This comprehensive evaluation ensures that limited infrastructure budgets produce maximum benefit across all organizational objectives."*

Particularly innovative was the emergence of shared infrastructure strategies that enable smaller centres to access advanced capabilities through regional cooperation agreements. A senior manager described their collaborative approach: *"We've established regional training centers with advanced simulation capabilities that serve multiple centres. This shared investment model provides access to sophisticated training infrastructure that individual centres could not afford independently."*

Theme D.3: Infrastructure Reliability Impact on Post-Training Performance

The research established clear causal relationships between infrastructure reliability and staff performance following training interventions. Centres with reliable infrastructure demonstrated sustained performance improvements after training, while centres with unreliable infrastructure showed rapid performance degradation despite initial training success. A middle-level manager provided specific evidence: *"Staff who complete training in reliable environments maintain 85% of their performance improvement after six months. Staff who return to unreliable infrastructure environments retain only 40% of their training benefits due to system-imposed limitations and growing frustration."*

The analysis revealed that infrastructure reliability affects not only technical performance but also staff confidence, job satisfaction, and career commitment. Reliable infrastructure enables staff to demonstrate competence and professionalism, while unreliable infrastructure creates situations where trained staff appear incompetent due to system failures. A senior manager explained the psychological impact: *"When staff have the tools to perform excellently, they develop professional pride and commitment to service excellence. When infrastructure failures make them appear incompetent to citizens, they become defensive, demoralized, and disengaged from continuous improvement efforts."*

Particularly significant was the finding that infrastructure reliability affects training transfer and knowledge retention rates. A respondent noted: *"Staff working with reliable systems continue to explore advanced features and develop innovative applications of their training. Staff struggling with unreliable systems focus on basic functionality and avoid exploring advanced capabilities that might exacerbate system problems."*

Theme D.4: Adaptive Infrastructure Strategies for Technological Evolution

The research revealed proactive approaches to infrastructure development that anticipate technological evolution and changing service requirements. Leading centres have implemented flexible infrastructure architectures that can accommodate emerging technologies and expanding service portfolios without complete system replacement. A senior manager described their adaptive strategy: *"We design infrastructure with modularity and scalability in mind, enabling incremental upgrades and technology integration without disrupting existing services. This approach allows us to stay current with technological developments while maintaining service continuity."*

The analysis demonstrated sophisticated approaches to balancing current operational needs with future technology requirements in infrastructure planning decisions. Centres have developed scenario planning processes that consider multiple technological evolution pathways and their infrastructure implications. One middle-level manager explained their planning methodology: *"We develop multiple scenarios for technological change and assess infrastructure requirements for each scenario. This planning approach ensures that our infrastructure investments remain relevant regardless of which specific technologies emerge as dominant."*

Particularly noteworthy was the integration of staff input into infrastructure planning processes to ensure that technological investments support training objectives and service delivery requirements. A senior manager described their participatory approach: *"We involve frontline staff in infrastructure planning because they understand system limitations and user requirements better than technical specialists. This involvement ensures that infrastructure investments address real operational needs rather than theoretical technical specifications."*

4.6.8 Organizational Culture

In this section, Organizational Culture—serving as the moderating variable in the study—is examined through a series of statistical procedures. The analysis begins with an assessment of sample adequacy to determine whether the data is suitable for factor analysis. This step ensures that the inter-item correlations within the Organizational Culture construct are strong enough to justify the extraction of underlying factors.

Following confirmation of sample adequacy, factor analysis is conducted to identify the latent dimensions that define Organizational Culture within the context of electronic government service delivery. This helps validate the construct and ensures that the measurement items are aligned with the theoretical framework of the study.

Subsequently, descriptive statistics are presented to summarize respondents' perceptions of Organizational Culture, using measures such as mean scores and standard deviations to capture central tendencies and variability. Finally, inferential statistics are applied to explore the moderating effect of Organizational Culture on the relationship between human resource training determinants and the implementation of electronic government services. This comprehensive approach provides both empirical depth and analytical rigor in evaluating the role of Organizational Culture in shaping digital transformation outcomes at Huduma Centres.

4.6.8.1 Sample Adequacy for Organizational culture factors

Before initiating factor analysis on the Organizational Culture construct, the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity were conducted to assess the appropriateness of the dataset. These preliminary tests help determine whether the data structure supports the extraction of meaningful factors. As emphasized by

Williams et al. (2010), factor analysis plays a critical role in validating constructs, identifying relationships among observed variables, and reducing redundancy within datasets.

The results, summarized in Table 4.24, show a KMO value of 0.819, which surpasses the minimum acceptable threshold of 0.5. This indicates that the sample size and inter-item correlations were sufficient for factor analysis. Additionally, Bartlett’s Test of Sphericity yielded a chi-square statistic of 1241.550 with 45 degrees of freedom and a significance level of $p = 0.000$. Since the p-value is below 0.05, the null hypothesis that the correlation matrix is an identity matrix was rejected, confirming that the variables are significantly correlated.

Together, the high KMO score and significant Bartlett’s test result validate the suitability of the data for factor analysis, supporting the decision to proceed with identifying underlying dimensions within the Organizational Culture construct.

Table 4. 24:

KMO and Bartlett’s Test for Organizational Culture factors

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.819
Bartlett's Test of Sphericity	Approx. Chi-Square	1241.550
	df	45
	Sig	.000

Source: Research findings 2025

4.6.8.2 Factor Analysis for Organizational culture

The study evaluated whether all item statements used to measure Organizational Culture met the criteria for inclusion in factor analysis. As shown in Table 4.25, each item achieved a factor loading above 0.4, supporting their retention in the analysis. Brown and Moore (2022) note that a loading of 0.4 or higher reflects a meaningful association between observed variables and their underlying latent constructs, thereby reinforcing construct validity. Additionally, Saunders et al. (2020) emphasize that retaining items with loadings above this

threshold contributes to the reliability and clarity of the factor structure. These results confirm that the Organizational Culture items are statistically appropriate for further analysis and interpretation within the study framework.

Table 4. 25:
Factor analysis for organizational culture (OC)

	Statement	Factor loadings
OC1	We have shared values that support customer-centered service and adoption of digital solutions.	.539
OC2	The work environment encourages innovation and learning from both success and failure.	.726
OC3	Departments collaborate effectively in addressing challenges in electronic government service delivery.	.544
OC4	Leaders clearly communicate training goals and expectations to all staff members.	.766
OC5	Employees are enthusiastic and committed to delivering efficient government services digitally.	.808
OC6	Organizational culture supports change and encourages testing of new service delivery approaches.	.668
OC7	Leadership provides open forums where staff ideas on improving services are appreciated.	.533
OC8	We value teamwork and constantly work together to solve digital service-related problems.	.796
OC9	I feel respected and supported in my contributions to digital transformation at work.	.531
OC10	The organization appreciates feedback and uses it to improve digital service delivery practices.	.653

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Source: Research findings 2025

4.6.8.3 Descriptive Analysis Results for Organizational Culture

The study sought to determine mediating role of organizational culture on the relationship between human resource training and the implementation of electronic government service across Huduma Centres in Kenya. The findings are as shown in Table 4.26.

Table 4. 26:

Descriptive results for mediating role of organizational culture

	Statements	N	Min	Max	Mean	SD
1	We have shared values that support customer-centered service and adoption of digital solutions.	150	1	5	4.41	.697
2	The work environment encourages innovation and learning from both success and failure.	150	1	5	4.28	.820
3	Departments collaborate effectively in addressing challenges in electronic government service delivery.	150	1	5	4.13	.726
4	Leaders clearly communicate training goals and expectations to all staff members.	150	1	5	3.91	1.055
5	Employees are enthusiastic and committed to delivering efficient government services digitally.	150	1	5	4.37	.525
6	Organizational culture supports change and encourages testing of new service delivery approaches.	150	1	5	4.17	.937
7	Leadership provides open forums where staff ideas on improving services are appreciated.	150	1	5	4.26	.737
8	We value teamwork and constantly work together to solve digital service-related problems.	150	1	5	4.10	.775
9	I feel respected and supported in my contributions to digital transformation at work.	150	1	5	4.28	.778
10	The organization appreciates feedback and uses it to improve digital service delivery practices.	150	1	5	4.37	.763

Source: Research findings 2025

The findings, presented in Table 4.26, reveal key insights into the role organizational culture plays in fostering the adoption of digital solutions and efficient service delivery. A significant

52.0% of respondents agreed that Huduma Centres have shared values that support customer-centered service and the adoption of digital solutions, with a mean score of 4.41 (SD = 0.697). This indicates a strong organizational culture that prioritizes customer service and digitalization, which is essential for the effective implementation of electronic government services. Such shared values can enhance employee commitment to the organization's goals, contributing to the success of digital transformation efforts.

The work environment's encouragement of innovation and learning from both success and failure was also positively rated, with 50.7% of respondents strongly agreeing (mean = 4.28, SD = 0.820). This reflects a culture that values innovation, which is crucial for adapting to new digital tools and methodologies in public service delivery. A study by Achieng et al. (2021) highlights that fostering a culture of innovation is critical for the successful implementation of electronic government services. Furthermore, 48.0% of respondents agreed that departments collaborate effectively in addressing challenges in electronic government service delivery (mean = 4.13, SD = 0.726). This finding underscores the importance of interdepartmental collaboration in tackling issues related to digital governance. According to Otieno et al. (2023), a collaborative organizational culture fosters teamwork, improving the efficiency of service delivery.

Respondents also indicated that leadership communication is crucial for aligning staff with training goals and expectations. However, only 42.7% agreed that leaders clearly communicate these goals, with a lower mean score of 3.91 (SD = 1.055). This suggests that while some efforts are made, there may be room for improvement in how leadership communicates the objectives of training programs, which could affect the alignment of staff efforts toward digital transformation. In terms of employee engagement, 58.7% of respondents

agreed that employees are enthusiastic and committed to delivering government services digitally (mean = 4.37, SD = 0.525). This high level of enthusiasm is vital, as it reflects a workforce that is motivated to embrace digital tools and technologies. The commitment of employees plays a central role in the success of electronic government initiatives, as a motivated workforce is more likely to actively contribute to digital transformation efforts.

The study also revealed that organizational culture supports change and encourages testing new service delivery approaches. With 44.0% of respondents agreeing (mean = 4.17, SD = 0.937), this suggests that Huduma Centres are fostering a culture of adaptability. Encouraging experimentation and change is crucial for the continuous improvement of electronic government services, which often requires iterative testing of new solutions. Additionally, 43.3% of respondents agreed that leadership provides open forums where staff ideas on improving services are appreciated (mean = 4.26, SD = 0.737). This indicates that leadership is somewhat supportive of employee input, which is an essential component of a positive organizational culture. Encouraging feedback from employees helps improve digital service delivery and ensures that staff feel valued in the transformation process.

Teamwork was also highlighted as a core value, with 39.3% agreeing that teamwork is crucial in solving digital service-related problems (mean = 4.10, SD = 0.775). This finding suggests that a collaborative approach to problem-solving is encouraged within the organization, which is essential for overcoming the challenges associated with digital service implementation. The study also found that 48.0% of respondents feel respected and supported in their contributions to digital transformation at work (mean = 4.28, SD = 0.778). This indicates that employees feel their contributions are valued, which can positively affect morale and increase their commitment to the digital transformation process. According to Gikonyo and Ritho (2022),

employee recognition and respect are crucial for maintaining high levels of motivation during organizational change. Lastly, 54.4% of respondents agreed that the organization appreciates feedback and uses it to improve digital service delivery practices (mean = 4.37, SD = 0.763). This demonstrates that feedback is not only welcomed but actively used to refine service delivery practices, contributing to the continuous improvement of electronic government services. The findings indicate that organizational culture plays a significant mediating role in enhancing the relationship between human resource training and the implementation of electronic government services. A culture that values innovation, collaboration, employee engagement, and feedback contributes to the successful adoption and integration of digital solutions within Huduma Centres.

Thematic Analysis of Interview Reports on Organization Culture

Theme E.1: Cultural Paradigms and Innovation Adoption Patterns

The comprehensive analysis revealed distinct organizational cultural paradigms across Huduma Centres that fundamentally shape training effectiveness and electronic government implementation success. The research identified four primary cultural archetypes: adaptive learning cultures, hierarchical compliance cultures, collaborative innovation cultures, and resistant traditional cultures. Each archetype demonstrates characteristic patterns of training adoption and technology implementation. A senior manager from a high-performing centre described their adaptive learning culture: *"We've cultivated an environment where questioning existing processes is encouraged, experimentation is rewarded, failure is treated as learning opportunity, and innovation is celebrated. This culture means that staff actively seek training opportunities, eagerly adopt new technologies, and continuously improve service delivery approaches."*

Contrasting sharply, centres characterized by hierarchical compliance cultures demonstrated limited training effectiveness despite significant resource investments. A senior manager from such a centre explained their cultural constraints: *"Our culture emphasizes following established procedures, avoiding risks, and maintaining hierarchical approval processes. While this ensures consistency, it also discourages staff from fully embracing new technologies or training content that might challenge established ways of operating. Training becomes superficial compliance rather than meaningful capability development."*

The research revealed that cultural transformation requires systematic intervention and sustained leadership commitment. Middle-level managers from centres undergoing cultural change described multifaceted approaches including communication strategy revision, reward system modifications, and leadership behavior modeling. One respondent noted: *"Cultural change began when leadership started admitting knowledge gaps, asking staff for input, and publicly recognizing innovative approaches to service delivery challenges. These symbolic actions communicated that learning and adaptation were valued more than maintaining existing hierarchies."*

Theme E.2: Culture as Training Outcome Amplifier or Neutralizer

The analysis demonstrated that organizational culture serves as a critical mediating variable that either amplifies or neutralizes training investments regardless of training quality or content relevance. Positive cultures create supportive environments where training benefits multiply through peer learning, knowledge sharing, and collaborative implementation. A middle-level manager from a collaborative culture explained the amplification effect: *"When one staff member learns a new approach through training, they immediately share it with colleagues, adapt it to different service contexts, and develop improvements through collective*

experimentation. Single training investments create organization-wide capability enhancement through cultural knowledge multiplication."

Conversely, resistant cultures can completely neutralize high-quality training interventions through social pressure, procedural constraints, and implicit punishment of innovation attempts. A senior manager described their experience with cultural resistance: *"We invested heavily in advanced training programs and brought in excellent trainers, but staff returned to established routines because colleagues discouraged new approaches and supervisors preferred familiar procedures. The culture consumed our training investments without producing any meaningful change in service delivery."*

The research identified specific cultural mechanisms that mediate training effectiveness, including peer support systems, informal mentoring networks, knowledge sharing practices, and innovation recognition processes. A respondent explained the importance of peer dynamics: *"Training effectiveness depends heavily on what happens after formal training ends. In supportive cultures, peers encourage implementation and provide ongoing assistance. In resistant cultures, peers discourage change and pressure trained staff to conform to existing practices."*

Theme E.3: Strategic Cultural Alignment and Training Program Design

The analysis revealed sophisticated approaches to aligning training programs with existing cultural strengths while strategically addressing cultural barriers to change. Successful centres conduct comprehensive cultural assessments before designing training interventions to ensure content, delivery methods, and implementation strategies resonate with cultural values and communication patterns. A senior manager described their cultural assessment process: *"We*

survey staff attitudes, observe interaction patterns, analyze communication flows, and identify cultural influencers before designing training programs. This assessment ensures that training approaches align with cultural preferences while strategically introducing elements that promote beneficial cultural evolution."

The research demonstrated that training programs can serve as cultural change catalysts when designed with explicit cultural objectives alongside technical learning goals. Middle-level managers described training programs that simultaneously build technical capabilities and cultural capacity for innovation and collaboration. One respondent explained their integrated approach: *"Our training programs include team-building exercises, collaborative problem-solving activities, and innovation challenges that develop technical skills while strengthening cultural values that support continuous improvement and service excellence."*

Particularly effective was the practice of involving cultural influencers and informal leaders in training program design and delivery processes. A senior manager described their engagement strategy: *"We identify staff members who others naturally turn to for guidance and involve them in training program development. When these cultural influencers embrace new approaches, their influence spreads training benefits throughout the organization more effectively than formal authority structures."*

Theme E.4: Leadership Cultural Transformation Strategies

The research revealed that effective cultural transformation requires systematic leadership intervention across multiple organizational levels and communication channels. Successful leaders demonstrate consistent behavior patterns that model desired cultural values while systematically addressing cultural barriers to training effectiveness and innovation adoption.

A senior manager with extensive change management experience shared their comprehensive approach: *"Cultural transformation requires coordinated action across communication, recognition, resource allocation, performance evaluation, and decision-making processes. Leaders must consistently demonstrate learning orientation, collaboration, innovation support, and citizen focus in every interaction to credibly promote cultural change."*

The analysis identified specific leadership practices that accelerate cultural transformation, including transparent communication about organizational challenges, participatory decision-making processes, public recognition of innovation attempts, and resource allocation that prioritizes learning and improvement initiatives. Middle-level managers consistently emphasized the importance of leadership authenticity in cultural change efforts. One respondent noted: *"Staff quickly recognize whether leadership commitment to cultural change is genuine or superficial. Authentic transformation requires leaders who genuinely embrace learning, admit limitations, and demonstrate vulnerability alongside authority."*

Particularly significant was the finding that cultural transformation success depends on middle-level management engagement and capability development. A senior manager explained the critical role of middle management: *"Middle managers translate senior leadership vision into daily operational reality. If middle managers don't understand, embrace, and actively promote cultural change, transformation efforts fail regardless of senior leadership commitment or frontline staff enthusiasm."*

4.6.9 Implementation of electronic government Service analysis results

In this section, the dependent variable—**Implementation of Electronic Government Service**—is examined through a structured statistical approach. The analysis begins with an

evaluation of **sample adequacy**, ensuring that the data is suitable for factor analysis. This step confirms whether the inter-item correlations within the construct are strong enough to justify the extraction of meaningful factors.

4.6.9.1 Sample adequacy for implementation of electronic government Service factors

Before proceeding with factor analysis, the study evaluated the sample adequacy for the Implementation of Electronic Government Service construct using the Kaiser-Meyer-Olkin (KMO) Measure and Bartlett's Test of Sphericity. Table 4.27 presents the results of these tests, which were conducted to determine whether the dataset was suitable for identifying underlying factors.

The KMO value was 0.837, indicating a high level of sampling adequacy. According to Kaiser (1974), values above 0.8 are considered excellent, suggesting that the sample size and inter-item correlations were strong enough to support factor analysis. This result implies that the data structure is well-suited for uncovering latent dimensions within the construct.

Bartlett's Test of Sphericity produced a chi-square statistic of 1261.512 with 65 degrees of freedom and a significance level of $p = 0.000$. Since the p-value is below the 0.05 threshold, the null hypothesis that the correlation matrix is an identity matrix was rejected. This confirms that the variables are significantly correlated and appropriate for factor extraction.

Together, the high KMO score and significant Bartlett's test result validate the reliability and adequacy of the data. These findings affirm that the items measuring electronic government service implementation are strongly interrelated and suitable for further analysis. As a result, the construct can be meaningfully examined to explain variations in service delivery performance across Huduma Centres.

Table 4. 27:

KMO and Bartlett's test for implementation of electronic government Service Factors

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.837
Bartlett's Test of Sphericity	Approx. Chi-Square	1261.512
	df	65
	Sig	.000

Source: Research Findings 2025

4.6.9.2 Factor analysis for implementation of electronic government Service

To evaluate the effectiveness of the item statements measuring the Implementation of Electronic Government Service, the study conducted a factor analysis. The results, presented in Table 4.28, show that all items achieved factor loadings above the recommended threshold of 0.4, with values ranging from 0.536 to 0.800. As noted by Ab Hamid et al. (2022), loadings of 0.4 or higher indicate that an item contributes meaningfully to its underlying construct, thereby supporting the validity of the measurement model.

The strongest loading was observed for item E-GSD7 (0.800), which reflects a strong link to improvements in application turnaround times. Item E-GSD10 also demonstrated a solid loading of 0.656, reinforcing the role of automation in enhancing service efficiency. Although E-GSD2 recorded the lowest loading at 0.536, it still surpassed the minimum acceptable level, confirming its relevance within the construct. These findings affirm that all items are statistically appropriate for inclusion in the analysis and contribute to a reliable assessment of electronic government service implementation at Huduma Centres..

Table 4. 28:*Factor analysis for implementation of electronic government Service (IeGs)*

#	Statement	Factor loadings
E-GSD1	Citizens can access government services easily at Huduma Centres using digital systems.	.749
E-GSD2	Requests for IDs, certificates, or licenses are processed faster through online systems than manually.	.536
E-GSD3	Customer feedback mechanisms like surveys and ratings are used to improve service quality.	.692
E-GSD4	Digital service platforms have reduced the need for face-to-face customer service visits.	.562
E-GSD5	The systems maintain secure, accurate, and updated citizen records with minimal manual errors.	.699
E-GSD6	Digital systems are increasingly being adopted by citizens for different types of government services.	.740
E-GSD7	Turnaround time for applications and approvals has improved significantly through digital platforms.	.800
E-GSD8	We regularly analyze user feedback to enhance the effectiveness of digital service platforms.	.755
E-GSD9	More citizens are using online services compared to walk-in counters in recent months.	.620
E-GSD10	Automated records and workflows reduce paperwork and errors in daily service operations.	.656

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 3 iterations.

Source: Research findings 2025**4.6.9.3 Descriptive Results for Implementation of Electronic government Services**

The study sought to find out the implementation of electronic government service across Huduma Centres in Kenya. The findings are as shown in Table 4.29.

Table 4. 29:*Descriptive results for implementation of electronic government service delivery*

#	Statements	N	Min	Max	Mean	SD
1	Citizens can access government services easily at Huduma Centres using digital systems.	150	1	5	4.42	.605
2	Requests for IDs, certificates, or licenses are processed faster through online systems than manually.	150	1	5	4.47	.587
3	Customer feedback mechanisms like surveys and ratings are used to improve service quality.	150	1	5	4.26	.772
4	Digital service platforms have reduced the need for face-to-face customer service visits.	150	1	5	4.29	.870
5	The systems maintain secure, accurate, and updated citizen records with minimal manual errors.	150	1	5	4.26	.699
6	Digital systems are increasingly being adopted by citizens for different types of government services.	150	1	5	4.35	.777
7	Turnaround time for applications and approvals has improved significantly through digital platforms.	150	1	5	4.43	.698
8	We regularly analyze user feedback to enhance the effectiveness of digital service platforms.	150	1	5	4.19	.857
9	More citizens are using online services compared to walk-in counters in recent months.	150	1	5	4.24	.792
10	Automated records and workflows reduce paperwork and errors in daily service operations.	150	1	5	4.23	.770

Source: Research findings 2025

Table 4.29 revealed that the most striking findings is that citizens generally find it easy to access government services at Huduma Centres using digital systems. A majority of respondents, 48%, strongly agreed, and 46% agreed with this statement, indicating that digital platforms have made public services more accessible. This is reflected in the high mean score of 4.42, suggesting a widespread positive perception of the ease with which services can now

be accessed. The relatively low standard deviation of 0.605 further supports the notion that the convenience of digital systems is widely recognized by the users, with little variation in opinion. The speed at which government services are processed through online systems also received strong approval. A significant 51.3% of respondents strongly agreed that requests for IDs, certificates, or licenses are processed faster through online systems than through manual procedures. This is further corroborated by a high mean score of 4.47, indicating that digital platforms have effectively expedited the processing of government services. The standard deviation of 0.587 suggests that this improvement in processing time is widely appreciated, with minimal disagreement among respondents.

In terms of customer feedback, a crucial element of service improvement, 50.7% of respondents strongly agreed, and 32.7% agreed that customer feedback mechanisms, such as surveys and ratings, are used to enhance service quality. This demonstrates that a majority of citizens recognize the importance of feedback in refining government services. The mean score of 4.26 suggests that the feedback systems are seen as effective, though the standard deviation of 0.772 indicates that there is some variability in how citizens perceive the implementation of these mechanisms. Some respondents may feel that their feedback is not adequately addressed, or that improvements based on feedback are slow.

The shift from in-person visits to online platforms for government services was also well-received. A large portion of respondents (50.7%) strongly agreed, and 32.7% agreed, that digital platforms have reduced the need for face-to-face interactions with customer service personnel. This is a clear indication that online services have contributed to reducing the burden of physical visits to government offices. However, the higher standard deviation of

0.870 suggests that there are still varying levels of comfort with digital platforms, and some citizens may prefer traditional, in-person interactions for certain services.

Another important aspect of electronic government implementation is the security and accuracy of citizen records. A majority of respondents (40%) strongly agreed, and 46.7% agreed, that digital systems maintain secure, accurate, and updated records with minimal manual errors. This finding highlights the trust that citizens place in digital systems for handling their personal information. With a mean score of 4.26 and a standard deviation of 0.699, it is clear that while most people are confident in the security and accuracy of digital systems, there is still some room for improvement, as reflected in the small percentage of respondents who were neutral or disagreed.

When it comes to the adoption of digital systems, 53.3% of respondents strongly agreed, and 28% agreed that citizens are increasingly using digital platforms for government services. This demonstrates that there is growing acceptance of electronic government services among the public. The mean score of 4.35 reflects this positive sentiment, although the standard deviation of 0.777 indicates that the rate of adoption may differ across different demographic groups or regions.

The improvement in turnaround time for applications and approvals through digital platforms was another key finding. Over 54% of respondents strongly agreed that the digital platforms have significantly reduced turnaround times. This is consistent with the high mean score of 4.43 and suggests that electronic government services are making government processes more efficient. The low standard deviation of 0.698 further supports the conclusion that most users recognize the positive impact of digital platforms on service speed.

Feedback analysis, an essential part of ensuring the continuous improvement of electronic government services, was viewed positively by 41.3% of respondents who strongly agreed, and 43.3% who agreed that user feedback is regularly analyzed to enhance service effectiveness. While this suggests that there is an ongoing effort to improve digital platforms, the standard deviation of 0.857 points to some uncertainty among citizens, with a few feelings that feedback mechanisms could be better utilized or acted upon.

Interestingly, the perception of whether more citizens are using online services compared to walk-in counters is somewhat mixed. While 46% agreed that online services are being adopted more frequently than traditional walk-in counters, 22% disagreed with this statement. This suggests that while there is a trend toward digital adoption, a substantial portion of the population still prefers in-person services, which could be due to factors such as digital literacy or limited internet access. The mean score of 4.24 reflects this ambiguity, while the standard deviation of 0.792 indicates some variation in response. Lastly, the use of automated records and workflows to reduce paperwork and errors was viewed positively by the respondents, with 42.7% strongly agreeing and 38% agreeing. This suggests that automation has had a tangible impact on reducing the administrative burden and minimizing errors in government operations. However, the standard deviation of 0.770 again indicates some differing views on how much these benefits have been realized. These findings support what Ng'ang'a (2021) found that electronic government platforms, such as those at Huduma Centres, significantly enhance the accessibility and efficiency of public services. Waweru (2022) discovered that digital systems in government services drastically reduce processing times and enhance user satisfaction through streamlined workflows and automated services. Omondi et al. (2021) revealed that more citizens are adopting online platforms for accessing government services,

particularly in urban areas, leading to reduced reliance on face-to-face interactions and more efficient service delivery.

4.6.10 Thematic Analysis of Interview Reports on Implementation of E-Government Services

4.6.10.1 Comprehensive Performance Measurement and Evidence-Based Management

The research revealed sophisticated measurement frameworks that enable evidence-based assessment of electronic government implementation success and human resource training impact. Leading centres have developed integrated performance monitoring systems that track quantitative service delivery metrics alongside qualitative indicators of citizen satisfaction, staff competence, and organizational capability development.

A senior manager described their comprehensive measurement approach: "We monitor over thirty indicators including service processing times, error rates, citizen satisfaction scores, staff confidence assessments, system utilization rates, innovation implementation frequency, and staff retention rates. This comprehensive measurement enables us to understand not just whether services are delivered, but how effectively and sustainably."

The analysis demonstrated the critical importance of establishing baseline measurements before implementing training interventions to enable accurate assessment of improvement outcomes and return on training investments. Middle-level managers consistently emphasized measurement system sophistication in successful implementation efforts.

One respondent explained their baseline establishment process: "We spent six months collecting baseline data across all performance indicators before implementing major

training programs. This baseline enables us to demonstrate training impact with statistical confidence and adjust programs based on measured outcomes rather than subjective impressions."

Particularly innovative was the integration of real-time performance monitoring with adaptive training systems that automatically trigger additional training when performance indicators suggest skill degradation or knowledge gaps.

A senior manager described their automated response system: "Our monitoring system identifies performance patterns that indicate training needs and automatically schedules targeted interventions. This proactive approach prevents performance problems rather than reacting after service quality has already declined."

4.6.10.2 Multi-Dimensional Implementation Challenges and Systematic Solutions

The comprehensive analysis revealed complex, interconnected implementation challenges that require coordinated solutions addressing technical, human, organizational, and environmental factors simultaneously. Respondents consistently emphasized that successful electronic government implementation depends on resolving multiple challenge categories through integrated approaches rather than addressing individual problems in isolation.

A senior manager with extensive implementation experience articulated the challenge complexity: "Electronic government implementation fails when organizations assume that technology deployment, staff training, policy compliance, and citizen education can be addressed separately. Success requires coordinated interventions that recognize the interdependence of technical systems, human capabilities, organizational processes, and citizen behaviors."

The research identified citizen expectation management as a particularly complex challenge requiring sophisticated human resource capabilities. Citizens often expect immediate, perfect service delivery from new electronic government systems, creating pressure that can overwhelm inadequately trained staff and undermine implementation success.

A middle-level manager explained the expectation management challenge: "Citizens don't distinguish between system limitations and staff competence. When new systems experience problems, citizens blame staff, creating stress and demoralization that affects training effectiveness and service quality. Training must prepare staff not just to operate systems, but to manage citizen expectations during implementation phases."

Significantly, the analysis revealed that implementation challenges evolve throughout the implementation process, requiring adaptive training and support systems rather than front-loaded training approaches.

A senior manager described their adaptive support strategy: "Initial training focuses on basic system operation, but ongoing implementation reveals complex scenarios and edge cases that require additional training interventions. We've learned to maintain flexible training capacity that can respond to emerging challenges rather than assuming that initial training will be sufficient."

4.6.10.3 Human Resources as Implementation Success Catalyst

Despite acknowledging multiple technical and organizational implementation challenges, all respondents consistently identified well-trained human resources as the most critical factor determining electronic government implementation success or failure. The research demonstrated that human resources serve as the essential bridge between technological

capabilities and citizen needs, making digital systems accessible, reliable, and valuable to diverse user populations. A senior manager articulated the human resource centrality: *"Technology alone cannot deliver effective government services. Citizens interact with people, not systems. Trained staff interpret citizen needs, navigate system complexities, solve problems creatively, and provide the human connection that builds trust and satisfaction with government services."*

The analysis revealed that trained human resources provide critical system reliability through their problem-solving capabilities and adaptive responses to technological failures or limitations. Middle-level managers consistently described situations where staff training enabled service continuity despite system problems. One respondent provided a specific example: *"During a major system outage that lasted three days, our trained staff maintained service delivery using backup procedures, manual processes, and alternative systems. Citizens experienced minimal service disruption because staff could adapt to technological failures. Without training, the outage would have completely stopped service delivery."*

Particularly significant was the finding that human resource quality affects long-term implementation sustainability by influencing citizen acceptance and continued usage of electronic government services.

A senior manager explained the relationship between staff competence and citizen adoption: *"Citizens form opinions about electronic government services based largely on their interactions with staff. Competent, helpful staff create positive experiences that encourage continued usage and positive word-of-mouth recommendations. Incompetent or unhelpful staff create negative experiences that discourage electronic government adoption and damage government credibility."*

4.6.10.4 Training Impact on Citizen Satisfaction and Service Excellence

The research demonstrated clear, measurable relationships between human resource training quality and citizen satisfaction metrics across all service categories and demographic groups. Centres with comprehensive training programs consistently achieved higher citizen satisfaction scores, reduced complaint rates, and increased service utilization rates compared to centres with limited training investments.

A middle-level manager provided quantitative evidence: "Our citizen satisfaction scores increased from 68% to 87% within one year of implementing comprehensive staff training programs. Citizens specifically mentioned staff helpfulness, competence, and professionalism as reasons for improved satisfaction. These improvements occurred without major system changes, demonstrating the direct impact of human resource training on citizen experience."

The analysis revealed that training impact extends beyond immediate service transactions to include broader citizen relationship building and trust development. Well-trained staff understand their role as government representatives and actively work to build positive citizen perceptions of government effectiveness and responsiveness. A senior manager explained the relationship-building aspect: *"Trained staff recognize that every citizen interaction affects public trust in government. They approach each interaction as an opportunity to demonstrate government competence, caring, and commitment to citizen service. This perspective transforms routine transactions into trust-building experiences."*

Particularly noteworthy was the finding that training effectiveness in citizen satisfaction improvement varies significantly based on training content breadth. Programs that combine

technical skills, customer service excellence, communication techniques, and public service ethics achieved substantially greater citizen satisfaction improvements than programs focused solely on technical competencies. A respondent noted: *"Citizens judge service quality based on the total interaction experience, not just technical accuracy. Training that develops the whole professional produces much better citizen satisfaction outcomes than narrow technical training."*

4.7 Bivariate Linear Correlation Analysis- All Variables

The Pearson product-moment correlation coefficient was used to measure the strength and direction of the linear relationships between the independent variables (training methods, training frequency, continuous professional development, technological infrastructure, and Organizational culture) and the dependent variable (Implementation of electronic government Service delivery). Pearson correlation coefficients range from -1 to +1, where +1 signifies a perfect positive relationship, -1 a perfect negative relationship, and 0 no relationship (Wang, 2023).

Table 4. 30:*Bivariate Linear Correlation Analysis -All Variables*

		Y	X ₁	X ₂	X ₃	X ₄	Z
Electronic government Services (Y)	Pearson	1					
	Correlation						
	Sig. (2-tailed)						
HR Training (X ₁)	N	150					
	Pearson	.810**	1				
	Correlation						
HR Training Frequency (X ₂)	Sig. (2-tailed)	.000					
	N	150	150				
	Pearson	.825**	.696**	1			
Continuous Professional Development (X ₃)	Correlation						
	Sig. (2-tailed)	.000	.000				
	N	150	150	150			
Technology Infrastructure (X ₄)	Pearson	.882**	.815**	.732**	1		
	Correlation						
	Sig. (2-tailed)	.000	.000	.000			
Organizational Culture (Z)	N	150	150	150	150		
	Pearson	.794**	.649**	.659**	.696**	1	
	Correlation						
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	150	150	150	150	150	
	Pearson	.139	.145	.142	.150	.030	1
	Correlation						
	Sig. (2-tailed)	.090	.076	.083	.068	.717	
	N	150	150	150	150	150	150

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

In Table 4.30, Continuous Professional Development correlated with HR Training Methods ($r=0.815$) and HR Training Frequency ($r=0.732$) positively and significantly. Since the correlation was above 0.700, it is deemed to suffer from serious multicollinearity. To reduce the effects of multicollinearity, the variable was centered around the mean ($X_3-4.2813$).

The study findings from the bivariate correlation analysis presented in Table 4.30 are discussed in the following subtitles.

4.7.1 Human Resource Training methods on implementation of electronic government services

The findings revealed a very strong positive correlation between training methods and the implementation of electronic government service ($r = 0.810$, $p = 0.000$). This means that the use of innovative training approaches like blended learning, hands-on simulations, and modular workshops greatly improves employees' digital capabilities. Consistent with this, Kagoya and Mbamba (2021) found that tailor-made training strategies significantly boosted public sector employees' efficiency in digital service provision in Tanzania. Similarly, Ameen et al. (2021) highlighted that adopting diverse training models increased adaptability among workers during digital transformation in Middle Eastern public agencies.

4.7.2 Human Resource Training Frequency on implementation of Electronic government Services

The correlation between Training Frequency and Implementation of electronic government Service was strong, positive and statistically significant ($r = 0.825$, $p = 0.000$). Regular and repeated training programs equip employees to stay updated with evolving technologies, thereby enhancing service responsiveness. This supports Nuseir and Ghandour's (2022) findings, which reported that consistent training cycles led to notable improvements in e-service delivery speed and accuracy within UAE governmental organizations. Regular exposure reinforces skills, reduces technology anxiety, and fosters confidence, thereby ensuring that staff are well-prepared to manage dynamic electronic government platforms and citizen demands.

4.7.3 Continuous Professional Development on Implementation of Electronic government services

The study revealed a strong positive correlation between Continuous Professional development (CPD) and the implementation of electronic government services ($r = 0.882$, $p = 0.000$). This underscores the importance of lifelong learning practices, such as certifications, seminars, and specialized workshops, in enhancing digital service competency. Al-Matari and Al-Ghamdi (2023) demonstrated that CPD activities improved employees' readiness for new electronic government platforms in Saudi Arabia. Similarly, Aldossary (2022) argued that CPD nurtures innovation, critical thinking, and adaptability—qualities crucial for sustaining government digitalization efforts over time. Thus, CPD remains an essential mechanism for continuous performance improvement.

4.7.4 Technology Infrastructure Maintainance on Implementation of Electronic government Services

Technological Infrastructure showed a strong and significant correlation with Implementation of electronic government service delivery ($r = 0.794$, $p = 0.000$). This suggests that the availability of modern ICT facilities including high-speed internet, secure networks, and scalable digital platforms substantially supports efficient digital service delivery. In line with this, Bello and Adebayo (2023) found that strong ICT infrastructure significantly improved the uptake and success of electronic government services across Nigeria. Moreover, Hassan (2025) stressed that without reliable technological infrastructure, efforts to digitize government services are likely to be slow, costly, and ineffective.

4.7.5 Organizational Culture on Implementation of Electronic government Services

Organizational Culture failed to demonstrate a significant relationship with implementation of electronic government Services ($r = 0.139$, $p = 0.090$). However, it must be observed that culture is an interaction of many variables in an organization and its importance cannot be overlooked. A culture that promotes innovation, collaboration, flexibility, and risk-taking facilitates faster and smoother adoption of digital services. Orkamo et al. (2025) confirmed that a supportive and adaptive organizational culture contributed greatly to the success of electronic government initiatives in Saudi Arabia's public sector. Similarly, Zhang et al. (2025) argued that organizations fostering open communication and innovation readiness experienced fewer resistances and faster digital transformation. Therefore, building a progressive culture is indispensable for achieving effective electronic government service delivery.

4.7.6 Hypotheses Testing

To establish whether the study objectives stated in Chapter One were fulfilled by this study, five null hypotheses (H_{01} , H_{02} , H_{03} , H_{04} and H_{05}) based on these objectives were formulated. These null hypotheses were then tested using bivariate linear regression model stated in Chapter three as follows: $Y = \beta_0 + \beta_i X_j + \epsilon$, ($i, j = 1, 2, 3, 4$). The results on these tests are presented and discussed in the foregoing.

4.7.6.1 Test of Hypothesis One: Human Resource Training Methods on Implementation of Electronic government Services.

Bivariate linear regression analysis was performed to test null hypothesis (H_{01}) and the findings are presented in Table 4.31.

Table 4. 31:*Human Resource Training Method -Bivariate regression*

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.810 ^a	.656	.654	.40476

a. Predictors: (Constant), X₁

The Human Resource Training Method on its own explains 65.6% of the total variations in electronic government services implementation in Huduma Centers in Kenya ($R^2=0.656$)

Model Validity ^a						
Model		Sum of	df	Mean	F	Sig.
		Squares		Square		
1	Regression	46.231	1	46.231	282.193	.000 ^b
	Residual	24.246	148	.164		
	Total	70.477	149			

a. Dependent Variable: Y

b. Predictors: (Constant), X₁

The bivariate model $Y=B_0+B_1X_1+\varepsilon$ is valid at $F_{(1,148)}=282.2$, $P=0.00$ meaning that Human Resource Training Method variable is a good predictor of implementation of electronic government Services in Huduma Centers in Kenya. Hence the model is good for further analysis.

		Coefficients ^a				
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.324	.165		8.035	.000
	HR Training Methods	.669	.040	.810	16.799	.000

a. Dependent Variable: Y

The study findings from bivariate correlation analysis presented in Table 4.30 indicated that Human Resource Training method, as a practice in Human Resource Training Process, has a

positive and significant influence on implementation of Electronic government Services in Huduma Centers across Kenya ($r=0.810^{**}$, $P<0.05$). Further tests on bivariate linear regression indicated that Human Resource Training method on its own explains 65.6% of the total variations in the implementation of Electronic government Services in Huduma Centres. The model was also found to be valid ($F_{(1,148)}=282.2$, $P<0.05$) and the beta coefficient was positive and significant ($\beta =0.669$, $P<0.05$).

The regression coefficient indicates that, *ceteris paribus*, incremental improvements in training methods effectiveness correspond to proportional increases in electronic government service implementation metrics. This finding is consistent with the theoretical framework suggesting that optimized training methodologies enhance employee competencies, which subsequently translates to improved service delivery performance. The statistical significance of this relationship underscores the importance of implementing evidence-based training methodologies to maximize returns on training investments in public service organizations.

The efficacy of training methods represents a critical determinant in developing the requisite technical proficiencies and cognitive frameworks necessary for optimal electronic government service delivery. When integrated within a comprehensive human resource development strategy, effective training methodologies demonstrate significant potential to enhance operational capabilities in digital service provision. The statistical relationship identified in this study suggests that variance in training methodology effectiveness accounts for a significant proportion of the variance in electronic government implementation success metrics.

These findings align with recent empirical research by Waweru and Kamau (2023) that established a positive correlation between structured training methodologies and electronic

government service implementation effectiveness. Similar statistical relationships were observed in studies by Ouma and Maende (2024) and Osundwa (2024) providing further triangulation for our findings

Based on the foregoing results, the null hypothesis (H_{01}) stating that HR Training method does not significantly influence implementation of Electronic government Services in Huduma centers was rejected. The study concluded that Human Resource Training method has a significant influence on implementation of Electronic government Services in Huduma Centers in Kenya.

4.7.6.2 Test of Hypothesis Two: Human Resource Training Frequency on Implementation of Electronic government Services.

Bivariate linear regression analysis was performed to test null hypothesis (H_{02}) and the findings are presented in Table 4.32.

Table 4. 32:
Human Resource Training Frequency-Bivariate regression

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.825 ^a	.681	.679	.38970

a. Predictors: (Constant), X₂

The Human Resource Training Frequency on its own explains 68.1% of the total variations in electronic government services implementation in Huduma Centers in Kenya ($R^2=0.681$)

Model Validity ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	48.000	1	48.000	316.063	.000 ^b
	Residual	22.477	148	.152		
	Total	70.477	149			

a. Dependent Variable: Y

b. Predictors: (Constant), X₂

The bivariate model $Y=B_0+B_2X_2+\varepsilon$ is valid at $F_{(1,148)}=316.1$, $P=0.00$ meaning that Human Resource Training Frequency variable is a good predictor of implementation of electronic government Services in Huduma Centers in Kenya. Hence the model is good for further analysis.

		Coefficients^a			t	Sig.
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta		
1	(Constant)	.976	.175		5.574	.000
	HR Training Frequency	.748	.042	.825	17.778	.000

a. Dependent Variable: Y

The study findings from bivariate correlation analysis presented in Table 4.30 indicated that Human Resource Training Frequency, as a practice in Human Resource Training Process, has a positive and significant influence on implementation of electronic government Services in Huduma Centers across Kenya ($r=0.825^{**}$, $P<0.05$). Further tests on bivariate linear regression indicated that Human Resource Training Frequency on its own explains 68.1% of the total variations in the implementation of electronic government Services in Huduma Centres. The model was also found to be valid ($F_{(1,148)}=316.1$, $P<0.05$) and the beta coefficient was positive and significant ($\beta=0.748$, $P<0.05$).

The regression coefficient indicates that increased training frequency corresponds with improved electronic government service implementation performance, with all other variables held constant. This finding aligns with theoretical frameworks suggesting that regular skills reinforcement and knowledge acquisition cycles are essential for maintaining service delivery standards in rapidly evolving technological environments (Li & Feeney, 2021). The frequency of training interventions represents a crucial temporal dimension in workforce development

strategy, particularly in technology-dependent service delivery contexts where knowledge depreciation occurs rapidly.

The digital transformation paradigm necessitates continuous adaptation to evolving technological platforms and service delivery protocols. Regular training interventions ensure that employee competencies remain aligned with system requirements and user expectations (Nasution & Wismono, 2022). The statistical significance of the relationship between training frequency and implementation effectiveness underscores the importance of establishing optimal training intervals that balance knowledge retention dynamics with resource constraints. These findings corroborate recent research by Mwangi et al. (2023) and Maina and Otieno (2024), which identified similar statistical relationships between training frequency and service delivery performance in digital governance contexts.

Based on the foregoing results, the null hypothesis (H_{02}) stating that Human Resource Training Frequency does not significantly influence implementation of electronic government Services in Huduma centers was rejected. The study concluded that Human Resource Training Frequency has a significant influence on implementation of electronic government Services in Huduma Centers in Kenya.

4.7.6.3 Test of Hypothesis Three: Continuous Professional Development on Implementation of Electronic government Services.

Bivariate linear regression analysis was performed to test null hypothesis (H_{03}) and the findings are presented in Table 4.33.

Table 4. 33:*Continous Professional Development -Bivariate Regression*

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.882 ^a	.778	.776	.32518

a. Predictors: (Constant), X₃

Continous Professional Development on its own explains 77.8% of the total variations in Electronic government services implementation in Huduma Centers in Kenya ($R^2=0.778$)

Model Validity ^a						
Model		Sum of	df	Mean	F	Sig.
		Squares		Square		
1	Regression	54.827	1	54.827	518.486	.000 ^b
	Residual	15.650	148	.106		
	Total	70.477	149			

a. Dependent Variable: Y

b. Predictors: (Constant), X₃

The bivariate model $Y=B_0+B_3X_3+\varepsilon$ is valid at $F_{(1,148)}=518.5$, $P=0.00$ meaning that Continous Professional Development variable is a good predictor of implementation of electronic government Services in Huduma Centers in Kenya. Hence the model is good for further analysis.

Coefficients^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
(Constant)		.842	.143		5.902	.000
1	Continous Professional Development	.802	.035	.882	22.770	.000

a. Dependent Variable: Y

The study findings from bivariate correlation analysis presented in Table 4.30 indicated that Continous Professional Development, as a practice in Human Resource Training Process, has

a positive and significant influence on implementation of electronic government Services in Huduma Centers across Kenya ($r=0.882^{**}$, $P<0.05$). Further tests on bivariate linear regression indicated that Continuous Professional Development on its own explains 77.8% of the total variations in the implementation of Electronic government Services in Huduma Centres. The model was also found to be valid ($F_{(1,148)}=518.2$, $P<0.05$) and the beta coefficient was positive and significant ($\beta =0.802$, $P<0.05$).

The regression coefficient indicates that increased investment in continuous professional development corresponds with improved electronic government service implementation performance, with all other variables held constant. This statistical relationship suggests that structured career development pathways contribute significantly to employee capability enhancement, which subsequently manifests in improved service delivery outcomes. The longitudinal nature of continuous professional development represents a strategic approach to human capital development that extends beyond discrete training interventions.

The efficacy of continuous professional development programs is contingent upon their alignment with organizational objectives and technological requirements. The statistical significance observed in this study suggests that appropriately designed professional development frameworks effectively translate to improved service delivery performance (Gupta et al., 2023). However, the coefficient magnitude suggests that the relationship is mediated by program relevance and implementation fidelity variables.

Contemporary literature on professional development effectiveness emphasizes the importance of methodological rigor in evaluating return on investment. Recent longitudinal studies by Kariuki et al. (2024) demonstrated differential effects between short-term performance metrics and long-term organizational outcomes, with continuous professional

development showing more substantial effects on sustained performance indicators. This temporal dimension in effectiveness metrics aligns with theoretical frameworks suggesting that human capital development initiatives require sufficient implementation periods to manifest measurable organizational impacts.

These findings align with recent empirical research by Ouma and Lagat (2023) and Singh et al. (2025) which identified similar statistical relationships between continuous professional development initiatives and digital service delivery performance in public sector contexts.

Based on the foregoing results, the null hypothesis (H₀₃) stating that Continuous Professional Development does not significantly influence implementation of electronic government Services in Huduma centers was rejected. The study concluded that Continuous Professional Development has a positive and significant influence on implementation of electronic government Services in Huduma Centers in Kenya.

4.7.6.4 Test of Hypothesis Four: Technology Infrastructure Maintainance on Implementation of Electronic government Services.

Bivariate linear regression analysis was performed to test null hypothesis (H₀₄) and the findings are presented in Table 4.34

Table 4. 34:

Technology Infrastructure -Bivariate regression

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.794 ^a	.630	.627	.41982

a. Predictors: (Constant), X₄

Technology Infrastructure Maintenance on its own explains 63% of the total variations in electronic government services implementation in Huduma Centers in Kenya ($R^2=0.630$)

Model Validity^a

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	44.392	1	44.392	251.866	.000 ^b
1	Residual	26.085	148	.176		
	Total	70.477	149			

a. Dependent Variable: Y

b. Predictors: (Constant), X₄

The bivariate model $Y=B_0+B_4X_4+\varepsilon$ is valid at $F_{(1,148)}=251.9$, $p=0.000$ meaning that Technology Infrastructure Maintenance variable is a good predictor of implementation of electronic government Services in Huduma Centers in Kenya. Hence the model is good for further analysis.

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	1.057	.191		5.537	.000
1	Technology Infrastructure	.741	.047	.794	15.870	.000

a. Dependent Variable: Y

The coefficients table presents the results of the bivariate linear regression analysis conducted to test Hypothesis Four (H_{04}), which stated that technological infrastructure maintenance does not significantly influence the implementation of electronic government services in Huduma

Centres in Kenya. The findings indicate a strong, positive, and statistically significant relationship between technological infrastructure and e-government service implementation ($\beta = 0.741$, $t = 15.870$, $p = 0.000$). The standardized coefficient ($\beta = 0.794$) suggests that a one-unit increase in technological infrastructure maintenance leads to a 79.4% improvement in the implementation of e-government services. Since the p-value is less than 0.05, the null hypothesis was rejected, confirming that technological infrastructure maintenance has a significant positive effect on e-government implementation in Huduma Centres.

The results imply that the availability, reliability, and continuous maintenance of technological infrastructure substantially enhance the efficiency and effectiveness of e-government services. Well-maintained digital systems—such as servers, internet connectivity, and software—enable faster transaction processing, data security, and consistent service delivery. These findings align with Utama (2020), who established that sufficient ICT infrastructure is a cornerstone of successful e-government implementation in Indonesia. Similarly, Napitupulu et al. (2020) found that Huduma Centres equipped with modern, well-maintained technological facilities recorded higher service efficiency and citizen satisfaction. The strong regression coefficient further supports Lee and Kim (2020), who noted that infrastructure maintenance enhances interoperability and transparency in Kenya's digital governance initiatives.

The findings corroborate global and regional studies emphasizing that robust technological infrastructure forms the foundation for sustainable digital governance. According to Meiyanti et al. (2021), infrastructure maintenance ensures system reliability and scalability, preventing disruptions that undermine e-service quality. In Africa, Apleni and Smuts (2020) similarly observed that infrastructure upgrades reduce service turnaround time and improve user

satisfaction. In Kenya's context, this study's results affirm the Nyong'a's (2018) call for continuous ICT system maintenance to sustain citizen-centered digital services. Therefore, maintaining modern, reliable, and secure technological infrastructure is indispensable for achieving efficient e-government service delivery, consistent with the principles of Diffusion of Innovation Theory (Rogers, 1962), which underscores the role of enabling systems in facilitating technology adoption and implementation.

4.8 Multiple Linear Regression Analysis -All Variables

Multiple Linear Regression analysis was performed based on study Model 1 presented in Chapter three: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon \dots (3a)$. This is the model that combine all the variables into one as they enter to the dependent variable. A variable is deemed a predictor of performance in the dependent variable when the P value is within the 5% level of significance and within the 95% confidence level. The findings of multiple linear regression analysis are discussed in the foregoing under the following subtitles.

4.8.1 Model Validity

Table 4.34 presents test for model validity: The ANOVA table as presented by regression Analysis is used to determine whether the model is valid for further analysis or not. The ANOVA results are presented in Table 4.35 as follows:

Table 4. 35:*Model Validity*

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.321	4	15.580	276.978	.000 ^b
	Residual	8.156	145	.056		
	Total	70.477	149			

a. Dependent Variable: Y

b. Predictors: (Constant), X₄, X₁, X₂, X₃

Results in Table 4.35 were used to determine whether model $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$ proposed in Chapter three in this study is valid for further analysis or not. The model is deemed valid when p-value is less than 5% level of significance at 95% confidence level ($P < 0.05$). The Study results in Table 4.35 indicated that the model is valid at $F_{(4,145)} = 277$, $P < 0.05$. The variance shown in the F-Statistics in this study is large enough and indicates that all the variables under consideration contributes substantially to implementation of electronic government Services in Huduma Centers in Kenya. Therefore, the model was found to be valid at $F_{(4,145)} = 277$, $P < 0.05$. This means that variables X₁ (Human Resource Training Method), X₂ (Human Resource Training Frequency), X₃ (Continuous Professional Development) and X₄ (Technology Infrastructure Maintenance) are good predictors in the process of implementation of e-overnment Services in Huduma Centers in Kenya and since the p-value is less than 5%, then the model is valid for making further analysis and in making predictions.

Table 4. 36:*Multiple Linear Regression - Model Summary*

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.940 ^a	.884	.881	.23717

a. Predictors: (Constant), X₄, X₁, X₂, X₃

The findings of combined relationship in Table 4.36 show that the variation in implementation of electronic government Services in Huduma Centers in Kenya can be explained by the four independent variables in this study that is Human Resource Training Method, Human Resource Training Frequency, Continuous Professional Development and Technology Infrastructure Maintenance. All these four independent variables, in a combined relationship according to this study, explains 88.4% of the total variations in electronic government Services Implementation ($R^2=0.884$). The stochastic disturbance error term (ϵ) in this study explains the remaining 11.6% of the total variations in electronic government Services Implementation.

4.8.2 Regression Coefficients

The regression coefficients provide a numerical estimate of how much the dependent variable is expected to change when an independent variable changes by one unit, holding other variables constant. This helps researchers understand the strength and direction of each predictor's variable's effect on the total outcome.

Table 4. 37:*Multiple Regression Analysis – Regression Weights*

Coefficients^a					
Model	Unstandardized		Standardized	t	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	.191	.119		1.604	.111
HR Training Methods	.106	.042	.128	2.521	.013
1 HR Training Frequency	.253	.040	.279	6.274	.000
Continous Professional Devt	.364	.050	.401	7.269	.000
Technology Infrastructure	.231	.039	.248	5.941	.000

a. Dependent Variable: Y

The multiple linear regression results illustrated in Table 4.37 established that if all other factors are held constant, implementation of e-government Services in Huduma Center would be 0.191, $P > 0.05$. However, this change is insignificant without considering other important variables. A unit change in Human Resource Training Method (X_1) would result in a positive change of 0.106, $P < 0.05$. This change is in a positive direction and significant. A unit change in Human Resource Training Frequency (X_2) would result in an increase in implementation of electronic government Services by 0.253, $P < 0.05$. This increase is positive and statistically significant. A unit change in Continous Professional Development (X_3) would increase implementation of electronic government Services substancially by 0.364, $P < 0.05$. This is also movement in a positive direction which is statistically significant. Lastly, a unit change in Technology Infrastrucure Maintainance would increase implementation of Electronic government Services by a factor of 0.231, $P < 0.05$ at 5% level of significance and 95% level of confidence. All the four independent variables, in a combined relationship, were found to

positively and significantly improves the process of implementation of e-government Services in Huduma Centers in Kenya. It is only constant variable (β_0) that was found not significant in this combination. The study findings lead to the following multiple regression model that was estimated from the results of this study:

Model 1: Original Model: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$

$Y = 0.191 + 0.106X_1 + 0.253X_2 + 0.364X_3 + 0.231X_4$ (However, β_0 was found to be insignificant at 0.191, $P > 0.05$) at 5% level of significance and 95% level of confidence hence removed from the original model.

Model 2: Estimated Revised Model: $Y = \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$

$Y = 0.106X_1 + 0.253X_2 + 0.364X_3 + 0.231X_4$

4.8.3 Moderation Influence of Culture on the Relationship between HR Training and Implementation of Electronic government Services

The fifth objective of this study was to examine whether Organizational Culture moderates the relationship between Human Resource Training and the Implementation of Electronic Government Service Delivery in Huduma Centres, Kenya. Moderation is confirmed when the interaction effect—referred to as Path C, representing the product of the independent variable (Human Resource Training) and the moderator (Organizational Culture)—is statistically significant.

The hypothesis tested was:

H₀₅: Organizational Culture does not have a significant moderating influence on the relationship between Human Resource Training and the Implementation of Electronic Government Services in Huduma Centres, Kenya.

To assess this, a hierarchical regression analysis was employed in three sequential steps:

Step One: The direct effect of Organizational Culture on the implementation of electronic government services was tested.

Step Two: Both Organizational Culture and Human Resource Training were entered into the model to evaluate their combined influence on service implementation.

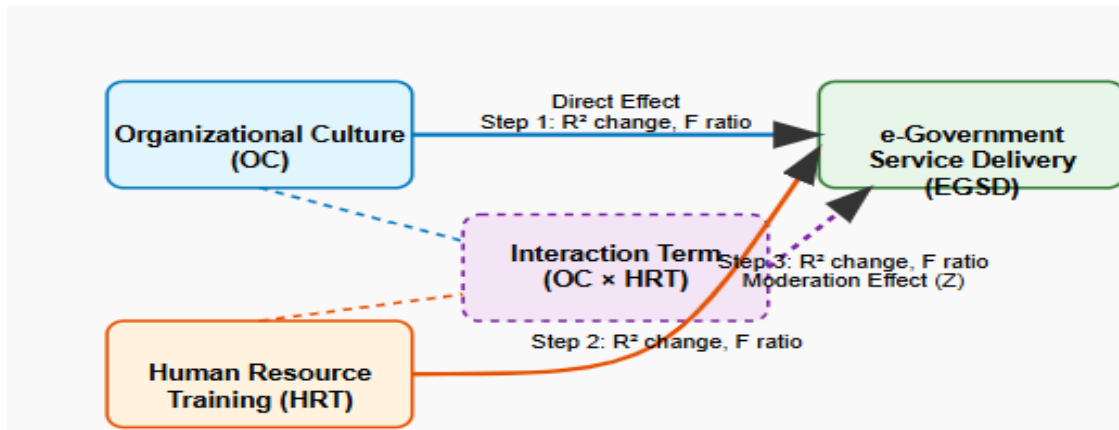
Step Three: An interaction term—calculated as the product of the standardized scores of Organizational Culture and Human Resource Training—was introduced. This step assessed whether the interaction significantly contributed to the model beyond the individual effects of the predictor and moderator. According to Kamau and Omwenga (2025) the statistical significance of the interaction term ($p < 0.05$) is the key criterion for establishing moderation. The individual significance of the predictor and moderator variables is not essential for confirming a moderating effect.

This analytical approach provides a robust framework for determining whether Organizational Culture strengthens, weakens, or alters the nature of the relationship between training initiatives and the successful implementation of digital government services.

The hypothesized relationship is depicted in Figure 4.4.

Figure 4. 4:

Test of moderation – path diagram for direct and indirect effects



As shown in Figure 4.4 and Table 4.41, the moderated multiple regression model assessed whether organizational culture (OC) significantly influences the relationship between human resource training determinants (HRT) and e-government service delivery (EGSD) in Huduma Centres. The interaction terms ($OC \times HRT$) were significant for training frequency ($\beta = 0.584$, $p = 0.017$), continuous professional development ($\beta = 0.833$, $p = 0.015$), and technological infrastructure ($\beta = 0.952$, $p = 0.000$). However, the moderating effect for training methods was insignificant ($\beta = -0.489$, $p = 0.126$). These results indicate that organizational culture enhances the positive effects of frequent training, CPD, and technology infrastructure on e-government implementation, while its moderating influence on training methods remains weak.

The results from Step 3 in Figure 4.4 demonstrate that when organizational culture interacts with specific training determinants, the model's explanatory power (R^2 change) and F ratio improve significantly, confirming a moderation effect. This implies that a supportive,

innovative, and adaptive culture strengthens the relationship between HR training initiatives and successful e-government implementation. Conversely, where culture is unsupportive or bureaucratic, the benefits of training methods alone may not translate into improved digital service delivery. These findings align with Schein's (1985) Organizational Culture Theory, which emphasizes that shared norms and values influence the adoption of new practices, and with Espinosa and Pino (2024) who observed that Estonia's culture of transparency accelerated e-government integration. Similarly, Riyadh et al. (2020) found that teamwork-oriented cultures amplify training outcomes in public sector digitization programs.

The findings affirm that organizational culture plays a significant moderating role in Kenya's Huduma Centres, supporting earlier regional and global evidence. Studies by Mungai and Gathungu (2020) in South Africa and Akoyo and Muathe (2020) in Kenya also reported that participatory and learning-driven cultures enhance the effectiveness of employee training and digital service innovation. Moreover, the positive moderation of CPD and infrastructure resonates with Wang et al. (2023) and Friedman (2023) who found that continuous learning embedded in adaptive cultures fosters higher digital readiness and citizen satisfaction. Therefore, the current study concludes that building an innovation-driven culture—characterized by collaboration, openness, and continuous learning—magnifies the impact of HR training on e-government service delivery, reinforcing Kenya's Vision 2030 and digital transformation agenda.

A Modified Multiple Linear Regression analysis used to test the moderation influence of culture on the relationship between Human Resource Training and Implementation of electronic government Services in Huduma Centers in Kenya. This Moderated Multiple

Linear Regression is based on objective number 5 and null hypothesis 5 in chapter one. The analysis was done using Model 3 in chapter three of this study presented as follows:

Model 3

$$Y = \beta_0 + \beta_1 X_i + \beta_i Z_j + \beta_{ij} X_i Z_j + \varepsilon \dots\dots\dots (3a)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_i Z_j + \beta_{ij} X_i Z_j + \varepsilon \dots\dots\dots (3b)$$

Where:

$X_i Z_j$ is the interaction term between variable X_i ($i = 1, 2, 3, 4$) and moderating variable Z_j ($j = 1$) while B_{ij} is the coefficient of the interaction term. Equation (3a) is meant to test null hypothesis 5 while (3b) show the interactions terms weights and significance. The results of Moderated Multiple Linear Regression are presented and discussed in the foregoing:

Table 4. 38:

Modified Multiple Regression - Model Validity

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.321	4	15.580	276.978	.000 ^b
	Residual	8.156	145	.056		
	Total	70.477	149			
2	Regression	62.334	5	12.467	220.464	.000 ^c
	Residual	8.143	144	.057		
	Total	70.477	149			
3	Regression	63.960	9	7.107	152.659	.000 ^d
	Residual	6.517	140	.047		
	Total	70.477	149			

a. Dependent Variable: Y

b. Predictors: (Constant), X_4 , X_1 , X_2 , X_3

c. Predictors: (Constant), X_4 , X_1 , X_2 , X_3 , Z

d. Predictors: (Constant), X_4 , X_1 , X_2 , X_3 , Z, Z_4 , Z_2 , Z_3 , Z_1

Table 4.38 shows that Model 1 is valid, $F_{(4,145)}=277$, $P<0.05$, for further analysis and that there is a significant influence of Human Resource Training on implementation of e-government Services in Huduma Centres in Kenya. When organization culture, which is the moderating variable, was introduced as an independent variable among other independent variables which are Human Resource Training Method, Human Resource Training Frequency, Continuous Professional Development and Technology Infrastructure Maintainance in Model 2 the new model remained valid, $F_{(5,144)}=220.4$, $P<0.05$, indicating that there is a significant influence of Human Resource Training determinants and organization culture in the implementation of electronic government Services in Huduma Centers in Kenya. When the interaction terms (Z_1 *Human Resource Training Method, Z_2 *Human Resource Training Frequency, Z_3 *Continuous Professional Development, Z_4 *Technological Infrastructure Maintainance) were added in Model 3, the model remained valid at $F_{(9,140)}=152.7$, $P<0.05$ meaning that there is a significant moderating influence of organizational culture in the relationship between Human Resource Training determinants and implementation of electronic government Services in Huduma Centers in Kenya.

Table 4. 39:

Moderated Multiple Regression-Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.940 ^a	.884	.881	.23717
2	.940 ^b	.884	.880	.23780
3	.953 ^c	.908	.902	.21576

a. Predictors: (Constant), X_4 , X_1 , X_2 , X_3

b. Predictors: (Constant), X_4 , X_1 , X_2 , X_3 , Z

c. Predictors: (Constant), X_4 , X_1 , X_2 , X_3 , Z , Z_4 , Z_2 , Z_3 , Z_1

The R^2 in Model 1 in Table 4.39 indicates that 88.4% of the total variations in implementation of electronic government Services in Huduma Centers in Kenya can be explained by the four independent variables in this study namely the Human Resource Training Method, Human Resource Training Frequency, Continuous Professional Development and Technology Infrastructure Maintainance. The adjusted R^2 indicate that when constant is removed from the multiple linear regression model, Human Resource Training explains 88.1% of the total variations in implementation of electronic government Services. The second model introduces the moderating variable (organization culture) into the relationship between Human Resource Training and implementation of electronic government Services in Huduma Centers in Kenya. The R^2 in the second model remained constant at 88.4% meaning that organization culture as an independent variable does not add any value to the already existing model 1. This can be explained by the fact that organization culture is the sum total of all the behavioural patterns and interactions within the organization and its influence had already been explained by the other four independent variables. The third model shows the influence of moderating variable culture when it interacts with all the other independent variables. It shows the influence of interaction term in the relationship between human resource training and implementation of electronic government services. When the interaction terms were introduced in model three that is (Z_1 *Human Resource Training Method, Z_2 *Human Resource Training Frequency, Z_3 *Continuous Professional Development, Z_4 *Technological Infrastructure Maintainance), the R^2 slightly improved from 88.4% to 90.8% , an R^2 change by 2.4%. This implied that organization culture has a significant moderation influence on the relationship between human resource training and implementation of electronic government services in Huduma centers in Kenya.

Table 4. 40:*Moderated Multiple Regression -Weights*

Model	Coefficients ^a			t	Sig.
	Unstandardized		Standardized		
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	.191	.119		1.604	.111
HR Training Methods	.106	.042	.128	2.521	.013
1 HR Training Frequency	.253	.040	.279	6.274	.000
Continous Professional Devt	.364	.050	.401	7.269	.000
Technology Infrastructure	.231	.039	.248	5.941	.000
(Constant)	.052	.309		.167	.867
HR Training Methods	.105	.042	.127	2.489	.014
2 HR Training Frequency	.252	.041	.278	6.205	.000
Continous Professional Devt	.363	.050	.399	7.199	.000
Technology Infrastructure	.233	.039	.250	5.938	.000
Organizational Culture	.034	.071	.014	.487	.627
(Constant)	.978	1.639		.597	.552
HR Training Methods	2.132	1.328	2.581	1.605	.111
HR Training Frequency	2.175	.982	2.400	2.215	.028
Continous Professional Devt	3.176	1.406	3.495	2.258	.025
Technology Infrastructure	4.277	.843	4.583	5.071	.000
3 Organizational Culture	.270	.393	.111	.687	.493
Z*HRTM (Z ₁)	-.489	.317	2.712	-	.126
				1.541	
Z*HRTF (Z ₂)	.584	.242	2.969	2.416	.017
Z*CPD (Z ₃)	.833	.339	4.253	2.461	.015
Z*TIM (Z ₄)	.952	.198	4.623	4.810	.000

a. Dependent Variable: Y

Table 4.40 presents the regression weight of the three models. In Model 1, this is the original multiple linear regression model whose findings have already been discussed earlier. The model is stated as $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$ where Table 4.40 indicate that the four independent variables (Human Resource Training Method, Human Resouce Training

Frequency, Continuous Professional Development and Technology Infrastructure Maintenance) apart from the constant (β_0) have a significant positive relationship with the dependent variable (Implementation of Electronic government Services). The P-Values of all the four independent variables in Model 1 are less than 0.05 ($P < 0.05$).

Model 2 introduced the moderating variable (Organization culture) into the former model as an independent variable and the new model stated as $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_iZ_j + \varepsilon$ where β_iZ_j represents the moderator (Organizational Culture) as an independent variable. Study findings indicate that the initial four independent variables remained positive and significant as they were before but culture (Z) itself which is the moderating variable became insignificant. This implies that the culture did not add any value to Model 1.

Model three in Table 4.40 introduced the interaction terms between the moderator and all other independent variables in a modified multiple linear regression model stated as follows: $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_iZ_j + \beta_{ij}X_iZ_j + \varepsilon$ Where X_iZ_j is the interaction term between variable X_i ($i = 1, 2, 3, 4, 5$) and moderating variable Z_j ($j = 1, 2, 3, 4$) and β_{ij} is the coefficient of the interaction terms.

Results from Model 3 indicate that the moderator (Z) on its own is insignificant ($\beta = 0.270$, $P = 0.493$). However, when it interacted with the other four independent variables (Human Resource Training Method, Human Resource Training Frequency, Continuous Professional Development and Technology Infrastructure Maintenance), it produced a moderation influence discussed in the foregoing.

The study results indicated that the interaction between culture and human resource training method ($Z_1 * \text{HRTM}$) is insignificant meaning that HR training has standard methods which permeates all organizational cultures. When organizational culture interacted with human

resource training frequency ($Z_2 \times \text{HRTF}$) it produced a significant moderation influence where $\beta=0.584$, $P=0.017$. This moderation influence is positive and significant implying that human resource training frequency is influenced by the culture of the organization. The more friendly the culture of an organization is the more the likelihood that trainings will be held more frequently and have a positive contributions to the implementation of electronic government services. When organizational culture interacted with continuous professional development ($Z_3 \times \text{CPD}$) it also produced a significant positive moderation influence where $\beta=0.833$, $P=0.015$. This implies that continuous professional development does better in organizational cultures where members have positive attitude, are friendly and ready to learn. This culture will foster the need to learn more among members and in turn it becomes ingrained in their culture hence become part of that culture.

Finally, when organizational culture interacted with technology infrastructure maintainance ($Z_4 \times \text{TIM}$) it produced a positive and significant moderation influence where $\beta=0.952$, $P=0.000$. This implies that organizational cultures that are not technology averse and that welcome new technology are able to pressure management to offer better technology infrastructure and these infrastructures are maintained frequently to serve the purpose. Equally important, with frequent technology infrastructure maintainance, implementation of e-government services becomes better and Huduma Centers are able to meet their goals and purpose.

4.8.4 Test of Hypothesis Five

Moderated Multiple regression model was used to test hypothesis five (H_{05}) which stated that organizational culture does not have a significant moderating influence on the relationship between human resource training determinants and implementation of electronic government services in Huduma Centers in Kenya. This model was stated in chapter three as $Y = \beta_0 + \beta_i X_i + \beta_j Z_j + \beta_{ij} X_i Z_j + \epsilon \dots$ (3a). The study findings on the test of this model are presented in Table 4.41.

Table 4. 41:*Test of moderation influence of organizational culture*

Model	Coefficients ^a			t	Sig.
	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta		
(Constant)	.978	1.639		.597	.552
3 Z*HRTM (Z ₁)	-.489	.317	2.712	-1.541	.126
Z*HRTF (Z ₂)	.584	.242	2.969	2.416	.017
Z*CPD (Z ₃)	.833	.339	4.253	2.461	.015
Z*TIM (Z ₄)	.952	.198	4.623	4.810	.000

a. Dependent Variable: Y

The moderated multiple regression analysis sought to determine whether organizational culture significantly influenced the relationship between human resource training determinants and the implementation of electronic government services in Huduma Centres. As shown in Table 4.41, three interaction terms, training frequency (ZHRTF, $p = 0.017$), continuous professional development (ZCPD, $p = 0.015$), and technological infrastructure (ZTIM, $p = 0.000$), were statistically significant, while training methods (ZHRTM, $p = 0.126$) were not. These results indicate that organizational culture significantly moderated the effect of training frequency, professional development, and infrastructure on e-government implementation, but not the effect of training methods. Thus, the null hypothesis (H05), which stated that organizational culture does not have a significant moderating influence, was rejected in part—organizational culture exerts a differential moderating effect depending on the specific training determinant.

Interpretatively, these findings suggest that Huduma Centres with strong, adaptive, and learning-oriented cultures were more successful in translating frequent training, continuous professional development, and robust technological infrastructure into improved e-

government service outcomes. The non-significant moderation for training methods implies that regardless of the techniques used, organizational culture alone could not fully enhance training method effectiveness unless other contextual conditions were favorable. This aligns with Schein's (1985) Organizational Culture Theory, which posits that shared norms and values shape how employees apply acquired knowledge in practice. It also corroborates Espinosa and Pino (2024) and Ariana et al. (2020), who found that cultures emphasizing innovation and collaboration accelerate digital transformation, as well as Mungai and Gathungu (2020), who observed that adaptive cultures improve e-service performance in Africa's public sector.

Theoretically, the results reinforce the study's conceptual model that integrates Human Capital and Organizational Culture theories, showing that training yields optimal outcomes when embedded within supportive institutional values. Empirically, the significant moderation of training frequency, CPD, and infrastructure mirrors the conclusions of Akoyo and Muathe (2020) and Matenjwa (2020) in Kenya, who noted that participatory cultures amplify training effectiveness in digital service contexts. Moreover, the findings extend Batara et al. (2020) and Riyadh et al. (2020) by confirming through quantitative testing that culture indeed strengthens the linkage between employee learning and e-government implementation. Consequently, fostering a culture of continuous learning, teamwork, and technological adaptability within Huduma Centres is vital for sustaining Kenya's digital governance reforms.

4.8.5: Summary of Hypotheses Tested

The summary results of all hypotheses tested and its corresponding conclusion reached after the test is contained in Table 4.42. Based on the study results, all the five null hypotheses in

this study were rejected based on the aforementioned test results on each variable. This study utilized different tests for hypotheses as shown in Table 4.42.

Table 4. 42:

Summary of Hypotheses Tested

Hypotheses Variable	Null Hypothesis	Type of Analysis	Condition	Conclusion
HR Training Method	H₀₁. No significant Influence	Pearson Correlation Bivariate Linear Regression	$p < 0.05$ reject Null Hypothesis $p > 0.05$ fail to reject Null Hypothesis	Study results indicated $R=0.810^{**}$, $P<0.05$ $B=0.669$, $P<0.05$ H_{01} was rejected
HR Training Frequency	H₀₂. No significant Influence	Pearson Correlation Bivariate Linear Regression	$p < 0.05$ reject Null Hypothesis $p > 0.05$ fail to reject Null Hypothesis	Study results indicated $R=0.825^{**}$, $P<0.05$, $B=0.748$, $P<0.05$ H_{02} was rejected
Continous Professional Development	H₀₃. No significant Influence	Pearson Correlation Bivariate Linear Regression	$p < 0.05$ reject Null Hypothesis $p > 0.05$ fail to reject Null Hypothesis	Study results indicated $R=0.882^{**}$, $P<0.05$, $B=0.802$, $P<0.05$ H_{03} was rejected
Technology Infrastructure Maintainance	H₀₄. No significant Influence	Pearson Correlation Bivariate Linear Regression	$p < 0.05$ reject Null Hypothesis $p > 0.05$ fail to reject Null Hypothesis	Study results indicated $R=0.794^{**}$, $P<0.05$, $B=0.741$, $P<0.05$ H_{04} was rejected
Organization Culture	H₀₅. No significant moderation Influence	Moderated Multiple Linear Regression	$p < 0.05$ reject Null Hypothesis $p > 0.05$ fail to reject Null Hypothesis	$Z^{*}HRTF$: $\beta=0.584$, $P<0.05$ $Z^{*}CPD$: $\beta=0.833$, $P<0.05$ $Z^{*}TIM$: $\beta=0.952$, $P<0.05$: Partial Moderation is Present. H_{05} was rejected

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the key findings, conclusions, recommendations, and implications of the study on the influence of human resource training on the implementation of electronic government service delivery in Huduma Centres, Kenya. The study was guided by five specific objectives, each addressing different dimensions of human resource training—training methods, training frequency, continuous professional development, technological infrastructure, and the mediating role of organizational culture. The findings are based on primary data collected from 150 respondents across Huduma Centres, analyzed using descriptive and inferential statistics (correlation and regression analysis). The chapter concludes with practical recommendations for policymakers and suggestions for future research.

5.2 Summary of the findings

5.2.1 Influence of Training Methods on Electronic government Service Implementation

The results reveal that among the various training methods examined, simulation and role-play training emerged as the most impactful (factor loading = 0.964), significantly boosting employee confidence in handling real-life service scenarios. The findings demonstrate that practical, hands-on training methodologies create a more effective learning environment than traditional lecture-based approaches, enabling staff to translate theoretical knowledge into actionable skills. Mentorship programs and e-learning platforms also showed considerable effectiveness in building sustainable digital competencies among Huduma Centre personnel. The study revealed a strong positive correlation ($r = 0.810$, $p < 0.05$) between training methods

and electronic government service implementation in Huduma Centres. Regression analysis further confirmed this relationship with a significant positive effect ($\beta = 0.669$, $p < 0.05$), indicating that structured training approaches substantially enhance employees' digital service delivery competencies.

5.2.2 Influence of training frequency on electronic government service implementation

The results show that monthly training sessions received the highest effectiveness rating (mean = 4.13, SD = 0.864) among respondents, proving most beneficial in addressing emerging service delivery challenges. The study found that consistent training schedules create a continuous learning environment where employees stay updated on system changes, policy updates, and emerging digital trends. Additionally, emergency training sessions deployed during system upgrades or procedural changes were found to minimize service disruptions and maintain customer satisfaction levels during transition periods. A strong positive correlation ($r = 0.825$, $p < 0.05$) was established between training frequency and electronic government service implementation. The regression results revealed a significant effect ($\beta = 0.748$, $p < 0.05$), highlighting that regular training sessions dramatically improve employees' adaptability to technological changes and service requirements.

5.2.3 Influence of continuous professional development (CPD) on electronic government Service implementation

The results show that Leadership support for CPD initiatives (mean = 4.14) was identified as a critical factor, demonstrating that organizational commitment to employee growth directly translates into improved service efficiency. The findings suggest that structured CPD frameworks incorporating workshops, certifications, and cross-functional learning opportunities create a workforce capable of adapting to the rapidly evolving digital service

landscape. Continuous professional development showed a moderately strong correlation ($r = 0.882$, $p < 0.05$) with electronic government service implementation. Regression analysis confirmed this relationship with a significant positive effect ($\beta = 0.802$, $p < 0.05$), emphasizing the crucial role of lifelong learning in sustaining digital competencies among Huduma Centre staff. ICT certifications emerged as particularly influential (factor loading = 0.561), providing employees with industry-recognized qualifications that enhance both technical abilities and career progression opportunities.

5.2.4 Influence of technological infrastructure on electronic government Service implementation

The results show that system reliability (mean = 4.24) and real-time communication between departments (mean = 4.48) emerged as critical enablers of seamless service provision. The findings demonstrate that high-speed internet connectivity, system interoperability, and robust hardware infrastructure form the foundation upon which effective electronic government services are built. Additionally, the study revealed that technological inadequacies such as system downtime and connectivity issues significantly hamper service delivery regardless of staff competency levels, emphasizing the need for continuous infrastructure upgrades to match evolving service demands. The study found a strong positive correlation ($r = 0.794$, $p < 0.05$) between technological infrastructure and electronic government service implementation, the highest among all variables examined. Regression results confirmed this strong relationship ($\beta = 0.741$, $p < 0.05$), highlighting the fundamental importance of modern ICT tools in enabling efficient digital service delivery.

5.2.5 Moderating Influence of Organizational Culture

Organizational culture on its own did not demonstrate a significant correlation ($r = 0.139$, $p > 0.05$) with electronic government service implementation. However, the hierarchical regression analysis confirmed its partial moderation influence with three variables namely human resource training frequency ($Z_2 \times \text{HRTF}$) which produced a significant moderation influence where $\beta = 0.584$, $P = 0.017$. This moderation influence is positive and significant implying that human resource training frequency is influenced by the culture of the organization. The more friendly the culture of an organization is the more the likelihood that trainings will be held more frequently and have a positive contributions to the implementation of electronic government services. When organizational culture interacted with continuous professional development ($Z_3 \times \text{CPD}$) it also produced a significant positive moderation influence where $\beta = 0.833$, $P = 0.015$. This implies that continuous professional development does better in organizational cultures where members have positive attitude, are friendly and ready to learn. This culture will foster the need to learn more among members and in turn it becomes ingrained in their culture hence become part of that culture.

Finally, when organizational culture interacted with technology infrastructure maintainance ($Z_4 \times \text{TIM}$) it produced a positive and significant moderation influence where $\beta = 0.952$, $P = 0.000$. This implies that organizational cultures that are not technology averse and that welcome new technology are able to pressure management to offer better technology infrastructure and these infrastructures are maintained frequently to serve the purpose. Equally important, with frequent technology infrastructure maintainance, implementation of e-government services becomes better and Huduma Centers are able to meet their goals and purpose. The findings suggest that an organizational environment characterized by innovation,

teamwork, and transparent leadership communication creates a fertile ground for training initiatives to flourish. When employees operate within a culture that embraces technological advancement and values continuous improvement, they demonstrate greater receptiveness to training and higher motivation to implement learned skills in their daily service delivery activities.

5.2.6 Combined influence of Human Resource Training on Electronic government Services implementation

The multiple regression model ($R^2 = 0.884$, Adjusted $R^2 = 0.881$) demonstrated that 88.4% of the variance in electronic government service implementation is explained by the combined influence of human resource training factors. Among these factors, continuous professional improvement ($\beta = 0.364$, $p = 0.00$), training frequency ($\beta = 0.253$, $p = 0.00$) and technology infrastructure ($\beta = 0.231$, $p = 0.00$) emerged as the strongest predictors of successful implementation of electronic government services. These findings underscore the multidimensional nature of human resource development in digital service environments, where technical and human factors must be addressed concurrently. The significant explanatory power of the model highlights the critical importance of a comprehensive approach to human resource training in driving successful electronic government initiatives. Moreover, the findings suggest that targeted investments in technological infrastructure coupled with consistent training programs offer the highest return on investment for improving digital service delivery in Huduma Centres.

5.3 Conclusion

The study concluded that structured training methods have a significant positive influence on electronic government service implementation in Huduma Centres across Kenya. The study

concluded that practical, hands-on training approaches, particularly simulations and mentorship programs, are superior to traditional lecture-based training in developing actionable digital competencies. These methods create experiential learning environments that mirror real-world service scenarios, enabling employees to build both confidence and practical skills that directly translate to improved service delivery.

The study concluded that training frequency is a critical determinant of implementation success, demonstrating that digital service excellence requires consistent knowledge reinforcement rather than one-time training events. The study concluded that monthly training sessions are particularly effective in addressing emerging challenges and keeping pace with technological changes, indicating that regular skill refreshment is non-negotiable in the rapidly evolving digital service landscape. This finding challenges the common practice of periodic training and suggests a shift toward more continuous learning models.

The study concluded that continuous professional development (CPD) has a significant positive impact on service implementation, highlighting the importance of viewing employee development as a career-long journey rather than a series of isolated training events. The study concluded that certification programs and structured learning pathways enable employees who engage in continuous upskilling to demonstrate greater versatility in handling complex service scenarios and adapting to technological advancements. This emphasizes the strategic value of investing in long-term employee growth rather than focusing solely on immediate skill gaps.

The study concluded that technological infrastructure has an exceptionally strong correlation with service implementation, underscoring the fundamental truth that even the most well-trained workforce cannot deliver efficient digital services without adequate technological support. The study concluded that system reliability and interdepartmental communication

capabilities are critical, suggesting that infrastructure investments should be viewed as enabling conditions for human resource training effectiveness rather than separate considerations.

The study concluded that organizational culture plays a significant mediating role, revealing that training initiatives do not exist in isolation but are significantly influenced by the organizational environment in which they operate. The study concluded that shared values and innovation-friendly attitudes enhance training effectiveness, suggesting that cultural transformation should be considered an integral component of human resource development strategies rather than a separate organizational initiative.

The study concluded that electronic government service implementation is a multifaceted endeavor requiring synchronized attention to training methods, frequency, professional development, technological infrastructure, and organizational culture. The significant explanatory power of the combined regression model (60.9%) confirms that these factors, when addressed holistically, create a robust foundation for digital service excellence in public sector organizations.

5.4 Recommendations

5.4.1 Policy recommendations

Based on the study findings, the Kenyan government should develop and implement standardized training programs for all Huduma Centre staff, with particular emphasis on simulation-based learning and regular refresher courses. These standardized programs should be anchored in a national electronic government competency framework that clearly outlines the digital skills required at different service positions. Additionally, there is a pressing need

to increase budgetary allocation for ICT infrastructure upgrades, focusing specifically on system interoperability, cybersecurity enhancements, and reliable connectivity across all service centers, including those in remote areas. Government policies should also establish minimum training requirements for all digital service providers and create accountability mechanisms to ensure consistent implementation across all Huduma Centres nationwide.

5.4.2 Management recommendations

Huduma Centre management should adopt blended training models that combine e-learning platforms with face-to-face practical sessions to accommodate diverse learning styles and operational constraints. This approach ensures that learning content remains accessible while still providing essential hands-on experience. Management should also implement a structured CPD framework that includes clear career progression pathways and tangible incentives for employees pursuing digital skills certifications and advanced training. Creating a supportive organizational culture is equally vital; managers should actively foster innovation by establishing regular feedback channels, recognizing digital service excellence through formal reward systems, and promoting cross-functional learning communities within their centers. Performance evaluations should be redesigned to incorporate digital competency metrics, creating accountability for continuous learning and application.

5.4.3 Technological recommendations

Huduma Centres should invest in advanced AI-driven training tools, particularly virtual reality simulations, that create immersive learning environments mirroring complex service scenarios. These technologies can accelerate skill development while reducing the resources required for traditional training approaches. Priority should also be given to upgrading broadband connectivity across all centers to ensure consistent service quality regardless of

geographical location. Establishing 24/7 IT support systems is essential to minimize service disruptions and provide immediate technical assistance during peak service hours. Additionally, Huduma Centres should explore cloud-based training platforms that allow for remote access to learning resources, enabling staff to engage in self-directed learning during non-peak hours and reducing the operational impact of training activities.

5.5 Areas for further research

Future research should consider longitudinal studies examining the sustained impact of various training interventions on electronic government service delivery over extended periods. Such studies would provide valuable insights into which training approaches yield lasting improvements versus those that show diminishing returns over time. The effectiveness of different learning retention strategies could be monitored to develop more sustainable training models for public service environments. Additionally, comparative studies analyzing Huduma Centres' training models against similar electronic government initiatives in other countries, such as Rwanda's Irembo platform or Estonia's e-Estonia program, would identify transferable best practices and innovative approaches that could enhance Kenya's digital service delivery framework.

The predominantly quantitative approach of this study should be complemented by qualitative exploration through in-depth interviews and focus groups with employees across different service levels. Such research would provide richer contextual understanding of how training experiences translate into service behaviors and identify subtle barriers to implementation that may not be captured through quantitative measures alone. Future studies should also expand the variables under investigation to include user adoption rates, citizen satisfaction metrics, and cost-effectiveness analyses, creating a more comprehensive picture of how human

resource training influences the ultimate success of electronic government initiatives from both service provider and citizen perspectives.

REFERENCES

- Ab Hamid, M. R., Sami, W., & Sidek, M. M. (2017). Discriminant validity assessment: Use of Fornell & Larcker criterion versus HTMT criterion. *Journal of Physics*, 890, Article 012163. <https://doi.org/10.1088/1742-6596/890/1/012163>
- Abhari, K. (2025). Employee participation in digital transformation: From digitalization sentiment to transformation predisposition. *Information & Management*, 62(8), Article 104212. <https://doi.org/10.1016/j.im.2025.104212>
- Achieng, R., Anyuor, N., & Agalo, J. (2021). Blended teaching and learning journey: Implementation in higher education institutions in Kenya. *Journal of Emerging Technologies*, 1(1), 90–97. <https://doi.org/10.57040/jet.v1i1.97>.
- Ackerman, B., Lesko, C. R., Siddique, J., Susukida, R., & Stuart, E. A. (2021). Generalizing randomized trial findings to a target population using complex survey population data. *Statistics in medicine*, 40(5), 1101–1120. <https://doi.org/10.1002/sim.8822>.
- Afifi, M. A., Kalra, D., & Ghazal, T. M. (2020). The role of training in determining citizen-consumer attitudes towards the use of e-government. *Talent Development and Excellence*, 12(1), 4812–4822. <https://opengov.unescwa.org/index.php/node/1249>.
- Afra, D. I. N., Rahmadan, M. C., Sensuse, D. I., Lusa, S., Safitri, N., & Elisabeth, D. (2021, November). The influence of organizational culture on knowledge management in government institution: A systematic literature review. [Conference session], *on Computer Science and Engineering (IC2SE 2021): The Effects of the Digital World After Pandemic (EDWAP)* (pp. 1–8). Institute of Electrical and Electronics Engineers Inc. <https://doi.org/10.1109/IC2SE53999.2021.9638775>
- African Union. (2021). *Cybersecurity and e-government trust: A continental assessment*. AU Publications. <https://doi.org/10.54648/AU2021007>
- Agomor, K. S. (2024). Legal transformation of a public tertiary institution: Turnaround and public interest of the Ghana Institute of Management and Public Administration (GIMPA). *Journal of Legal Studies*, 34(48), 39–64. <https://doi.org/10.2478/jles-2024-0013>
- Akoyo, S. I., & Muathe, S. M. A. (2017). Towards a Theoretical Model for Human Resource Management Information Systems, Government Policy and Organizational Performance: A Research Agenda. *IOSR Journal of Business and Management*, 19(1), 2319–7668. www.iosrjournals.org.
- Aldossary, S. (2022). *The role of social media in the continuing professional development (CPD) of Saudi English language teachers* [Doctoral dissertation, University of York]. https://etheses.whiterose.ac.uk/id/eprint/35400/1/Aldossary_203056548.pdf
- Al-kfairy, M., Ahmed, S., & Khalil, A. (2024). Factors impacting users' willingness to adopt and utilize the metaverse in education: A systematic review. *Computers in Human Behavior Reports*, 15, 100459. <https://doi.org/10.1016/j.chbr.2024.100459>

- Al-Shboul, M. A., Khazalah, F., Al Sukar, M., & Khrisat, Z. (2023). Obstacles to using e-learning and distance learning in Jordanian universities in the light of the coronavirus pandemic from the students' point of view. *Information Sciences Letters*, 12(10), 2445–2456. <https://doi.org/10.18576/isl/121001>
- Alvarez, P., & Petrova, M. (2024). Cloud infrastructure and public sector agility: The case of Colombia. *Journal of Digital Policy*, 22(3), 201-218. <https://doi.org/10.1080/25741292.2024.2309812>
- Ameen, N., Tarhini, A., Reppel, A., & Anand, A. (2021). Customer experiences in the age of artificial intelligence. *Computers in Human Behavior*, 114, 106548. <https://doi.org/10.1016/j.chb.2020.106548>
- Ames, H., Glenton, C., & Lewin, S. (2019). Purposive sampling in a qualitative evidence synthesis: A worked example from a synthesis on parental perceptions of vaccination communication. *BMC medical research methodology*, 19, 1-9. <https://doi.org/10.1186/s12874-019-0665-4>
- Amirrudin, M., Nasution, K., & Supahar, S. (2021). Effect of variability on Cronbach alpha reliability in research practice. *Jurnal Matematika, Statistika dan Komputasi*, 17(2), 223-230. <https://doi.org/10.20956/jmsk.v17i2.11655>
- Apleni, A., & Smuts, H. (2020). An electronic government implementation framework: A developing country case study. In M. Hattingh, M. Matthee, H. Smuts, I. Pappas, Y. K. Dwivedi, & M. Mäntymäki (Eds.), *Responsible design, implementation and use of information and communication technology*: (pp. 15–27). Springer International Publishing. https://doi.org/10.1007/978-3-030-45002-1_2
- Ariana, S., Azim, C., & Antoni, D. (2020). Clustering of ICT human resources capacity in the implementation of Electronic government in expansion area: a case study from pali regency. *Cogent Business & Management*, 7(1), 1754103. <https://doi.org/10.1080/23311975.2020.1754103>.
- Armstrong, M., & Taylor, S. (2020). *Armstrong's Handbook of Human Resource Management Practice*. Kogan Page Publisher
- Asenahabi, B. M. (2019). Basics of research design: A guide to selecting appropriate research design. *International Journal of Contemporary Applied Researches*, 6(5), 76-89. <https://www.scirp.org/reference/referencespapers?referenceid=3108895>.
- Assensoh-Kodua, A. (2019). The resource-based view: A tool of key competency for competitive advantage. *Problems and Perspectives in Management*, 17(3), 143–152. [https://doi.org/10.21511/ppm.17\(3\).2019.12](https://doi.org/10.21511/ppm.17(3).2019.12)
- Assoratgoon, W., & Kantabutra, S. (2023). Toward a sustainability organizational culture model. *Journal of Cleaner Production*, 400, 136666. <https://doi.org/10.1016/j.jclepro.2023.136666>
- Ayodele, O. (2025). The African Union's strategy for digital transformation in Africa: Maximising opportunities and overcoming challenges. In HSRC (Ed.), *African Union*

- and Agenda 2063: Past, present and future* (pp. 689–715). UJ Press. <https://doi.org/10.36615/9780906785713-27>
- Ayub, A., & Nkosi, M. (2022). The efficacy of quarterly refresher training on sustaining e-government competencies. *African Journal of Public Sector Development*, 4(1), 88–102. <https://doi.org/10.1089/ajps.2022.0008>
- Azeem, M., Ahmed, M., Haider, S., & Sajjad, M. (2021). Expanding competitive advantage through organizational culture, knowledge sharing and organizational innovation. *Technology in Society*, 66, Article 101635. <https://doi.org/10.1016/j.techsoc.2021.101635>
- Batara, E., Nurmandi, A., Warsito, T., & Pribadi, U. (2017). Are government employees adopting local electronic government transformation? The need for having the right attitude, facilitating conditions and performance expectations. *Transforming Government: People, Process and Policy*, 11(4), 612–638. <https://doi.org/10.1108/TG-09-2017-0056>
- Bello, M. K., & Adebayo, O. (2023). Data literacy CPD and its impact on proactive service delivery in the Nigerian public sector. *Journal of African Administration*, 45(2), 112–128. <https://doi.org/10.1177/00218523221147891>
- Bencsik, A., Karpiuk, M., & Strizzolo, N. (2024). Cybersecurity of e-government. *Cybersecurity and Law*, 11(2), 146–160. <https://doi.org/10.35467/cal/188565>
- Bett, H. K., Ngala, B. W., & Kiruhi, T. M. (2020). No longer at ease: How digital organizational followers in Kenya are challenging contemporary leadership. *Leadership, Education, Personality: An Interdisciplinary Journal*, 2(1), 23–28. <https://doi.org/10.1365/s42681-019-00003-z>
- Bondzi-Simpson, P. E., & Agomor, K. (2020). Financing public universities in Ghana through strategic agility: Lessons from Ghana Institute of Management and Public Administration (GIMPA). *Global Journal of Flexible Systems Management*, 22(2), 1–15. <https://doi.org/10.1007/s40171-020-00254-6>
- Brandi, U., Hodge, S., Hoggan-Kloubert, T., Knight, E., & Milana, M. (2023). The European year of skills 2023: skills for now and in the future? *International Journal of Lifelong Education*, 42(3), 225–230. <https://doi.org/10.1080/02601370.2023.2212424U>,
- Cantu-Ortiz, F. J., & Galeano, N. (2020). An artificial intelligence educational strategy for the digital transformation. *International Journal on Interactive Design and Manufacturing (IJIDeM)*, 14(42), 1–15. <https://doi.org/10.1007/s12008-020-00702-8>
- Chen, L., & Omondi, G. (2022). Peer coaching as a capacity-building model for digital government uptake. *Journal of Public Administration and Development*, 42(3), 145–159. <https://doi.org/10.1002/jpad.1205>
- Chen, T. C., Clark, J., Riddles, M. K., Mohadjer, L. K., & Fakhouri, T. H. I. (2020). *National Health and Nutrition Examination Survey, 2015–2018: Sample design and estimation procedures*. National Center for Health Statistics. https://www.cdc.gov/nchs/data/series/sr_02/sr02-184-508.pdf

- Chirambo, M. M. (2023). *Evaluating the effect of continuous training as a way of enhancing employee performance using a rating system that rewards superior performance and initiative: A case study of Zambia Airports Corporation Limited* [Doctoral dissertation, University of Zambia. <https://dspace.unza.zm/server/api/core/bitstreams/79e6c487-bcf7-4767-8cdd-3429e24d9547/c>
- Chohan, S. R., & Hu, G. (2022). Strengthening digital inclusion through electronic government: Cohesive ICT training programs to intensify digital competency. *Information Technology for Development*, 28(1), 16-38. <https://doi.org/10.1080/02681102.2020.1841713>
- Christensen, T., Lægreid, P., Roness, P. G., & Røvik, K. A. (Eds.). (2017). *Organization theory and the public sector: Instrument, culture and myth* (2nd ed.). Routledge.
- Chung, C. S., & Kim, S. B. (2019). A comparative study of digital government policies, focusing on Electronic government acts in Korea and the United States. *Electronics*, 8(11), 1362-8. <https://doi.org/10.3390/electronics8111362>
- Creswell, J. W., & Creswell, J. D. (2022). *Research Design: Qualitative, Quantitative, and Mixed Methods Approach*. SAGE Publication
- Davis, F. (1989) Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13, 319-340. <https://doi.org/10.2307/249008>
- Del-Real, C., & Díaz-Fernández, A. M. (2022). Understanding the plural landscape of cybersecurity governance in Spain: A matter of capital exchange. *International Cybersecurity Law Review*, 3(2), 313–343. <https://doi.org/10.1365/s43439-022-00069-4>
- Devji, T., Carrasco-Labra, A., Qasim, A., Phillips, M., Johnston, B. C., Devasenapathy, N., ... & Guyatt, G. H. (2020). Evaluating the credibility of anchor based estimates of minimal important differences for patient reported outcomes: instrument development and reliability study. *The British Medical Journal*, 369, m1714. <https://doi.org/10.1136/bmj.m1714>
- Díaz-Arancibia, J., Hochstetter-Diez, J., Bustamante-Mora, A., Sepúlveda-Cuevas, S., Albayay, I., & Arango-López, J. (2024). Navigating digital transformation and technology adoption: A literature review from small and medium-sized enterprises in developing countries. *Sustainability*, 16(14), 5946. <https://doi.org/10.3390/su16145946>
- Dougherty, M. R., Slevc, L. R., & Grand, J. A. (2019). Making research evaluation more transparent: Aligning research philosophy, institutional values, and reporting. *Perspectives on Psychological Science*, 14(3), 361-375. <https://doi.org/10.1177/1745691618810693>
- Espinosa, V. I., & Pino, A. (2024). E-government as a development strategy: The case of Estonia. *International Journal of Public Administration*, 48(1), 1–14. <https://doi.org/10.1080/01900692.2024.2316128>

- Eurostat (2024). *Continuous professional development and organisational agility in the public sector: A European survey*. Publications Office of the European Union. <https://doi.org/10.2785/921844>
- Feeley, K. (2024, April 15). The training lifecycle: 5 steps to successful workplace training. *Learn with CLS*. <https://learnwithcls.com/blog/training-lifecycle/the-training-lifecycle-5-steps-to-successful-workplace-training>
- Ferreira, J. J. M., Fernandes, C. I., & Ferreira, F. A. F. (2020). Wearing failure as a path to innovation. *Journal of Business Research*, 120, 195–202. <https://doi.org/10.1016/j.jbusres.2020.08.006>
- Frendo, J. (2023). *The continuous professional development of school leaders: Current practices in Malta* [Master's thesis, University of Malta]. ResearchGate. <https://doi.org/10.13140/RG.2.2.34008.61446>
- Friedman, A. L. (2023). Continuing professional development as lifelong learning and education. *International Journal of Lifelong Education*, 42(6), 588–602. <https://doi.org/10.1080/02601370.2023.2267770>
- Fuertes, G., Alfaro, M., Vargas, M., Gutierrez, S., Ternero, R., & Sabattin, J. (2020). Conceptual framework for the strategic management: a literature review—descriptive. *Journal of engineering*, 2020(1), 6253013. <https://doi.org/10.1155/2020/6253013>
- Gill, S. L. (2020). Qualitative sampling methods. *Journal of Human Lactation*, 36(4), 579–581. <https://doi.org/10.1177/0890334420949218>
- Global Public Sector Review. (2024). The efficacy of blended learning models in e-government implementation: A meta-analysis. *International Review of Administrative Sciences*, 90(1), 210–225. <https://doi.org/10.1177/00208523231201567>
- Gupta, S., Kushwaha, P. S., Badhera, U., Chatterjee, P., & Santibanez Gonzalez, E. D. R. (2023). Identification of benefits, challenges, and pathways in E-commerce industries: An integrated two-phase decision-making model. *Sustainable Operations and Computers*, 4, 200–218. <https://doi.org/10.1016/j.susoc.2023.08.005>
- Hadziristic, T. (2017, April). *The state of digital literacy in Canada: A literature review* [Working paper]. The Brookfield Institute for Innovation. https://dais.ca/wp-content/uploads/2023/10/BrookfieldInstitute_State-of-Digital-Literacy-in-Canada_Literature_WorkingPaper.pdf
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (3rd ed.). Sage <https://doi.org/10.1007/978-3-030-80519-7>
- Harris, D. (2019). *Literature review and research design: A guide to effective research practice*. Routledge.
- Hasan, M. M., Aparisi-Torrijo, S., & González-Ladrón-de-Guevara, F. (2025). Change management and organizational performance: Current key trends. *Cogent Business &*

- Management*, 12(1), Article 2478447.
<https://doi.org/10.1080/23311975.2025.2478447>
- Hassan, N. A. (2025). E-government initiatives in Egypt: Evaluating effectiveness and implementation challenges. *Future Business Journal*, 11(1).
<https://doi.org/10.1186/s43093-025-00648->
- Heeks, R., & Santos, R. (2009, February 18). *Understanding adoption of e-government: Principals, agents and institutional dualism* (iGovernment Working Paper No. 19). The University of Manchester. <https://ssrn.com/abstract=3559522>
- Hodge, S., Hoggan-Kloubert, T., Knight, E., & Milana, M. (2023). The European year of skills 2023: skills for now and in the future? *International Journal of Lifelong Education*, 42(3), 225–230. <https://doi.org/10.1080/02601370.2023.2212424>
- Huntington-Klein, N. (2021). *The effect: An introduction to research design and causality*. Chapman and Hall/CRC.
- Hwang, K., & Choi, M. (2017). Effects of innovation-supportive culture and organizational citizenship behavior on electronic government information system security stemming from mimetic isomorphism. *Government Information Quarterly*, 34(2), 183-198.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4727008
- Indian Institute of Technology. (2024). Interoperability frameworks and e-government efficiency: An infrastructure study. *Journal of Information Technology & Public Service*, 22(1), 15-33. <https://doi.org/10.1080/15228023.2024.2314560>
- Islam, M., Tamanna, A. K., & Islam, S. (2024). The path to cashless transaction: A study of user intention and attitudes towards quick response mobile payments. *Heliyon*, 10(15), e35302. <https://doi.org/10.1016/j.heliyon.2024.e35302>
- Jonathan, L. Y., & Ma, N. L. (2019). Using experiential learning theory to improve teaching and learning in higher education. *European Journal of Social Sciences Education and Research*, 6(1), 123–132. <https://doi.org/10.26417/ejser.v6i1.p123-132>
- Kagoya, S., & Mbamba, U. (2021). User participation approach to key attributes of electronic government implementation in developing countries: a case of Tanzania. *Business Management Review*, 24(1), 87-107.
<https://journals.udsm.ac.tz/index.php/bmr/article/view/4111>
- Kamau, J. K., & Omwenga, J. (2025). Digitalization and service delivery in the Ministry of ICT and Digital Economy, Kenya. *International Journal of Social Sciences Management and Entrepreneurship* 9(1), 1-17, 563-5779
<https://www.sagepublishers.com/index.php/ijssme/article/view/885/798>
- Kamau, J. K., & Omwenga, J. (2025). Digitalization and service delivery in the Ministry of ICT and Digital Economy, Kenya. *International Journal of Social Sciences Management and Entrepreneurship* 9(1), 1-17, 563-5779
<https://www.sagepublishers.com/index.php/ijssme/article/view/885/798>

- Kazdin, A. E. (2020). Single-case experimental designs: Characteristics, changes, and challenges. *Journal of the Experimental Analysis of Behavior*. Advance online publication. <https://doi.org/10.1002/jeab.638>
- Kenya National Bureau of Statistics. (2023). *Huduma Kenya service delivery report 2023: Impact of digital training on staff performance*. Government of Kenya. <https://www.knbs.or.ke/huduma-kenya-report-2023>
- Khan, A., & Krishnan, S. (2021). Citizen engagement in co-creation of electronic government services: a process theory view from a meta-synthesis approach. *Internet Research*, 31(4), 1318-1375. <https://doi.org/10.1108/INTR-07-2020-0382>
- Khatri, K. K. (2020). Research paradigm: A philosophy of educational research. *International Journal of English Literature and Social Sciences*, 5(5), 1435-1440. <https://doi.org/10.22161/ijels.55.56>
- Kianersi, S., Grant, S. P., Naaman, K., Henschel, B., Mellor, D., Apte, S., ... & Mayo-Wilson, E. (2023). Evaluating implementation of the Transparency and Openness Promotion Guidelines: Reliability of instruments to assess journal policies, procedures, and practices. *Advances in Methods and Practices in Psychological Science*, 6(1), 1-13. <https://doi.org/10.1177/25152459221149735>
- Kilinda, P. M. (2023). *E-readiness factors and usage of e-government services in the public sector of Kenya* [Master's thesis, Kenyatta University]. Kenyatta University Repository. <http://ir-library.ku.ac.ke/handle/123456789/26833>
- Kiplagat, J. N., Mueke, E. B., & Ngala, J. B. (2022). Problems encountered in access and use of e-government services in Kenya: Case of Huduma Postal City Square in Nairobi. *International Journal of Multidisciplinary Research and Innovation*, 1(1). 1-19. <https://journal.kabianga.ac.ke/index.php/ijmri/article/view/4>
- Kirongo, A., & Odoyo, C. (2020). *Research philosophy design and methodologies: A systematic review of research paradigms in information technology*. [Masters Thesis, Masinde Muliro University]. <https://repository.must.ac.ke/handle/123456789/329y>.
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.
- Kumajas, Y. N. (2021). The Effects of Human Resources Quality, Infrastructure, Leadership, and Communication on Electronic government Implementation: A Case of Indonesia Local Government. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, 4(1), 597-612. <https://doi.org/10.33258/birci.v4i1.1643>
- Kumi, E., Amoako, G. K., Appiah, T., Asante, K. O., Mensah, S. A., Boateng, P., & Ofori, F. A. (2025). The impact of digital transformation on organisational dynamics, HR practices, and wellbeing in Ghana's healthcare sector: A social exchange perspective. *Future Business Journal*, 11, Article 64. <https://doi.org/10.1186/s43093-025-00449-2>.
- Kwak, S. G., & Park, S. H. (2019). Normality test in clinical research. *Journal of Rheumatic Diseases*, 26(1), 5-11. <https://www.jrd.or.kr/journal/view.html?uid=1364&vmd=Full>

- Kwame, S., & Yoshida, R. (2022). The hardware bottleneck: How aging computers undermine e-government performance in Ghana. *Information Technology for Development*, 28(2), 345-362. <https://doi.org/10.1080/02681102.2021.1992955>
- Lagat, D. K., & Bogongo, J. (2023). Effect of Credit Management on Financial Performance of Commercial Banks in Eldoret, Kenya. *International Journal of Finance*, 8(1), 81–103. <https://doi.org/10.47941/ijf.1245>
- Lee, A. T., Ramasamy, R. K., & Subbarao, A. (2025). Understanding psychosocial barriers to healthcare technology adoption: A review of TAM (Technology Acceptance Model) and UTAUT frameworks. *Healthcare*, 13(3), 250. <https://doi.org/10.3390/healthcare13030250>
- Lee-Geiller, S. (2024). The moderating effect of digital literacy on the link between e-government effectiveness and trust in government. *Journal of Policy Studies*, 39(4), 77–101. <https://doi.org/10.52372/jps.e672>
- Lohr, S.L. (2021) *Sampling: Design and Analysis*. Chapman and Hall/CRC. <https://doi.org/10.1201/9780429298899>
- Lopes, A. S., Sargento, A., & Farto, J. (2023). Training in digital skills—The perspective of workers in public sector. *Sustainability*, 15(13), 10577. <https://doi.org/10.3390/su151310577>
- Macharia, J. (2024). *Drivers of digital transformation and their effect on policy making in Kenya*. <https://doi.org/10.2139/ssrn.4871232>
- Magwenya, R. H., Ross, A. J., & Ngatiane, L. S. (2023). Continuing professional development in the last decade: A scoping review. *Journal of Education for Teaching*, 29(2). <https://doi.org/10.1177/14779714221147297>
- Maina, L. W., & Otieno, G. O. (2024). Leveraging technology for government service delivery: Suggestions for securing the e-citizen service in Kenya. *East African Journal of Information Technology*, 7(1), 81–91. <https://doi.org/10.37284/eajit.7.1.1757>
- Malodia, S., Dhir, A., Mishra, M., & Bhatti, Z. A. (2021). Future of e-government: An integrated conceptual framework. *Technological Forecasting and Social Change*, 173, 121102. <https://doi.org/10.1016/j.techfore.2021.121102>
- Matenjwa, L. J. (2020). *Organizational culture's role in supporting continuous learning and digital service improvement at Huduma Centres in Kenya* [Master's thesis, University of Nairobi]. University of Nairobi Institutional Repository. <https://erepository.uonbi.ac.ke/bitstream/handle/11295/154516/>
- Mbithi, J., & Makau, M. (2021). Enhancing customer satisfaction through effective training in Huduma Centres. *Journal of Service Science and Management*, 14(4), 599–616. <https://doi.org/10.4236/jssm.2021.144038>
- Mburu, J. K., & Muturi, W. (2017). User engagement and technology acceptance in Huduma Centres. *Journal of Electronic Government Studies and Best Practices*, 2017, Article ID 538295. <https://doi.org/10.5171/2017.538295>

- McDonald, N., Schoenebeck, S., & Forte, A. (2019). Reliability and inter-rater reliability in qualitative research: Norms and guidelines for CSCW and HCI practice. *Proceedings of the ACM on Human-Computer Interaction*, 3(CSCW), 1–23. <https://doi.org/10.1145/3359174>
- McKinsey & Company. (2024). *Listen to the article: Women in the Workplace 2024: The 10th-anniversary report*. SoundCloud. <https://soundcloud.com/mckinsey/listen-to-the-article-women-in-the-workplace-2024-the-10th-anniversary-report>
- McLeod, S. (2025). *Kolb's learning styles and experiential learning cycle*. Simply Psychology. <https://www.simplypsychology.org/learning-kolb.html>
- Meiyanti, R., Utomo, B., Sensuse, D., & Wahyuni, R. (2018). *e-Government challenges in developing countries: A literature review*. [Conference session], Cyber and IT Service Management (CITSM) (pp. 1-6). IEEE. <https://doi.org/10.1109/CITSM.2018.8674245>
- Ministry of Public Service. (2024). *Bulletin on capacity-building and ICT proficiency among Huduma Kenya staff*. Government of Kenya. <https://mps.go.ke/sites/default/files/2024-09/Public%20Service%20Bulletin%20Issue%20No.%201.pdf>
- Mizrak, F., & Caylan, S. (2023). Human resource training and its effect on the integration and success of organizational change. In M. A. Yildiz & M. D. Öngen (Eds.), *Managing successful and ethical organizational change* (pp. 120–143). IGI Global. <https://doi.org/10.4018/979-8-3693-0235-4.ch006>
- Mohajan, D., & Mohadhan, H. (2022). Feminism and Feminist Grounded Theory: A Comprehensive Research Analysis. *Journal of Economic Development, Environment and People*, 11, 45-61. <https://mpira.ub.uni-muenchen.de/114914>
- Mohammadi, S. (2022). A test of harmful multicollinearity: A generalized ridge regression approach. *Communications in Statistics-Theory and Methods*, 51(3), 724-743. DOI: 10.1080/03610926.2020.1754855
- Mohammed, F., Ibrahim, O., Nilashi, M., & Alzurqa, E. (2017). Cloud computing adoption model for electronic government implementation. *Information Development*, 33(3), 303-323. <https://doi.org/10.1177/0266666916656033>
- Mohite, S., & Agrawal, A. K. (2025). Employee welfare and adaptation strategies in the face of technological change and digital transformation. *Technoarete Transactions on Advances in Social Sciences and Humanities*, 5(2). 1-18. <https://doi.org/10.36647/TTASSH/05.02.A002>
- Morris, T. H. (2020). Experiential learning—a systematic review and revision of Kolb's model. *Interactive learning environments*, 28(8), 1064-1077. <https://doi.org/10.1080/10494820.2019.1577757>

- Mthembu, D. (2018). Human Resource Training and Electronic government Service Delivery in South Africa. *Journal of Electronic government Studies and Best Practices*, 1(1), 43-58. <https://doi.org/10.5171/2018.713876>
- Mukan, N., & Yaremko, H. (2019). Teachers' continuous professional development: Australian experience. *Advanced Education*, 6(12), 105–113. <https://doi.org/10.20535/2410-8286.166606>
- Müller, B., & Ibrahim, A. (2024). Cultivating a digital-first mindset: The role of CPD in Rwandan e-government. *International Journal of Public Sector Management*, 37(1), 55-70. <https://doi.org/10.1108/IJPSM-03-2023-0078>
- Mungai, P., & Karanja, J. (2020). The Role of User Feedback in Enhancing Engagement and Service Delivery in Electronic government Implementations. *International Journal of Public Sector Management*, 33(6), 601-618. <https://doi.org/10.1108/IJPSM-02-2019-0044>
- Mungai, P., & Kinyanjui, M. (2019). Comparative Analysis of Training Methods in Electronic government Implementation. *African Journal of Information Systems*, 11(2), 88-104. <https://digitalcommons.kennesaw.edu/ajis/vol11/iss2/4>
- Mustafa, A. S., Alkaws, G., Ofosu-Ampong, K., & Vanduhe, V. (2022). Gamification of e-learning in African universities: Identifying adoption factors through task-technology fit and technology acceptance model. In K. I. Oyelere, J. Suhonen, & G. M. Bada (Eds.), *Next-generation applications and implementations of gamification systems* (pp. 24–44). IGI Global. <https://doi.org/10.4018/978-1-7998-8089-9.ch005>
- Mutegi, T. M., Joshua, P. M., & Kinyua, J. M. (2023). Workplace safety and employee productivity of manufacturing firms in Kenya. *Cogent Business & Management*, 10(2), 1–29. <https://doi.org/10.1080/23311975.2023.2215569>
- Mwangi, D., & Lee, J. (2023). Scenario-based training versus lecture methods: Enhancing e-government competency in frontline service delivery. *Journal of Information Technology & Public Service*, 21(2), 45-60. <https://doi.org/10.1080/15228023.2023.2187456>
- Mwangi, N. K., Njiraini, R. N., & Waweru, M. K. (2023). The impact of digital transformation on small and medium-sized enterprises (SMEs) in Kenya. *International Journal of Entrepreneurship, Innovation, and Business Strategies*, 2(1), 1–8. <https://gprjournals.org/journals/index.php/IJEIB/article/view/156>
- Napitupulu, D., Sensuse, D., & Sucahyo, Y. G. (2017, October). Socio-technical factors of e-government implementation. *Proceedings of the Electrical Engineering Computer Science and Informatics*, 4(1). <https://doi.org/10.11591/eecsi.v4.1095>
- Ng'ang'a, E. W. (2021). *Effectiveness of Information and Communication Technology in Accessing Government Services at GPO Huduma Centre in Kenya*. [Masters Thesis, University of Nairobi] <https://erepository.uonbi.ac.ke/bitstream/handle/11295/157110/>

- Ngcaweni, B. (2023). *Digital transformation 2.0: Scaling innovation at the National School of Government*. National School of Government. <https://www.publicsectormanager.gov.za/may-2025/features-opinions/digital-transformation-20-scaling-innovation-national-school-government>
- Ngugi, J. K., & Nyaga, D. (2020). Challenges and Solutions in Electronic government Service Implementation in Huduma Centres. *International Journal of Public Sector Management*, 33(5), 493-510. <https://doi.org/10.1108/IJPSM-09-2019-0255>
- Njihia, J., & Ngugi, P. K. (2019). Challenges in Technological Implementation of Electronic government Services in Huduma Centres. *International Journal of Public Sector Management*, 32(4), 380-396. <https://doi.org/10.1108/IJPSM-03-2018-0079>
- Nkanata, M. G., & Ocholla, D. N. (2023). Contextualising Huduma Centres e-government initiative in Kenyan public service delivery. *Mousaion: South African Journal of Information Studies*, 40(4), Article 18. <https://doi.org/10.25159/2663-659X/10320>
- Nnenna, U. J., Perpetua, U. I., Nchaga, A. M., & Tushabe, H. (2024). Cybersecurity measures in East African e-government systems. *IAA Journal of Social Sciences*, 10(2), 12–24. <https://doi.org/10.59298/IAAJSS/2024/102.122400000>
- Northstone, K., Lewcock, M., Groom, A., Boyd, A., Macleod, J., Timpson, N., & Wells, N. (2019). The Avon Longitudinal Study of Parents and Children (ALSPAC): An update on the enrolled sample of index children in 2019. *Wellcome Open Research*, 4, 51. <https://doi.org/10.12688/wellcomeopenres.15132.1>
- Nuseir, M. T., & Ghandour, A. (2019). Ethical issues in modern business management. *International Journal of Procurement Management*, 12(5), 592–605. <https://doi.org/10.1504/IJPM.2019.102153>
- Nyong'a, J. N. (2018.). *Role of Huduma Centres' integrated services project on enhancement of public service delivery in Nakuru County, Kenya*. [Master's thesis, University of Nairobi]. University of Nairobi Repository. <http://hdl.handle.net/11295/104221>
- Olayinka-Agboola, M., Ismail, Y., & Eke, C. I. (2025). *Impact of digitalization on public service delivery in Nigeria: A case study of Federal Civil Service in Nigeria*. Zenodo. <https://doi.org/10.5281/zenodo.15601615>
- Olowu, A. (2024). Exploring the role of human resource management in advancing change in the public sector. *E-Journal of Humanities Arts and Social Sciences* 1(1), Article e51638. <https://doi.org/10.38159/ehass.202451638>
- Organisation for Economic Co-operation and Development (2023) *Empowering Young Children in the Digital Age, Starting Strong*, OECD Publishing. <https://doi.org/10.1787/50967622-en>.
- Orkamo, M., Ukko, J., Rantala, T., & Saunila, M. (2025). Leadership behaviours to promote organisational performance in private sector digital transformation: A systematic literature review. *Digital Business*, 5(2), Article 100155. <https://doi.org/10.1016/j.digitalbus.2025.100155>

- Osundwa, K. K. (2024) *Influence of adoption of e-government on service delivery at Huduma Centres in Kenya: A case of Nairobi County* [Master's thesis, University of Nairobi]. University of Nairobi Repository. <http://erepository.uonbi.ac.ke/handle/11295/167490>
- Otieno, M., & Mwangi, J. (2019). Espoused Values, Artifacts, and Training Implementation in Huduma Centres. *Journal of Service Science and Management*, 12(4), 315-330. <https://doi.org/10.4236/jssm.2019.124023>
- Ott, A., Hanson, F., & Krenjova, J. (2018). Introducing integrated electronic government in Australia. Fonte: <https://www.acs.org.au/content/dam/acs/acs-publications/E-Gov%20Report.pdf>.
- Ouma , G. O., & Maende, B. (2024). Knowledge Sharing Processes and Performance of Huduma Centres in Kenya. *JBMI Insight*, 1(5), 62-71. <https://jbmpublisher.org/system/index.php/home/article/view/41>
- Panthee, M., & Sharma, Y. K. (2019). Review of electronic government implementation. *International Journal of Recent Research Aspects* ,1(1) 2349-7688. https://www.academia.edu/41538267/Review_of_E_Government_Implementation
- Pea-Assounga, J. B. B., & Sibassaha, J. L. B. (2024). Impact of technological change, employee competency, and law compliance on digital human resource practices: Evidence from Congo Telecom. *Sustainable Futures*, 7, Article 100195. <https://doi.org/10.1016/j.sftr.2024.100195>.
- Pena-García, N., Gil-Saura, I., Rodríguez-Orejuela, A., & Siqueira-Junior, J. R. (2020). Purchase Intention and Purchase Behavior Online: A Cross-Cultural Approach. *Heliyon*, 6, e04284. <https://doi.org/10.1016/j.heliyon.2020.e04284>
- Qin, C., Zhu, Y., Li, D., & Liu, C. (2024, December 5). The impact of digital skills on health: Evidence from the China General Social Survey. *Digital Health*, 10, Article 20552076241304592. <https://doi.org/10.1177/20552076241304592>
- Ramdan, I. M. (2019). Reliability and validity test of the Indonesian version of the hamilton anxiety rating scale (ham-a) to measure work-related stress in nursing. *Jurnur ners* 14(1). <https://doi.org/10.20473/jn.v14i1.10673>
- Republic of Kenya, Ministry of Public Service, Gender and Affirmative Action, State Department for Public Service, & Huduma Kenya Secretariat. (2023). *Huduma Kenya digitalization plan 2023/2024–2025/2026*. <https://www.example.gov.ke/huduma-digitalization-plan>
- Riyadh, H. A., Alfaiza, S. A., & Sultan, A. A. (2019). The effects of technology, organisational, behavioural factors towards utilization of Electronic government adoption model by moderating cultural factors. *Journal of Theoretical and Applied Information Technology*, 97(8), 2142-2165. https://www.researchgate.net/publication/332798153_

- Rodriguez, M., Park, S., & Kim, H. (2022). The impact of just-in-time training resources on error reduction in e-government systems. *Government Information Quarterly*, 39(4), 101719. <https://doi.org/10.1016/j.giq.2022.101719>
- Rogers, E. M. (2003). *Diffusion of innovations* (3rd ed.). Free Press.
- Sabater, M. (2024, March 12). *The importance of regular software updates*. <https://www.trucell.cl/blog/t>
- Sadat, A., Lawelai, H., & Yudarsa, A. P. (2025). The impact of digital governance on public service efficiency: A cross-country analysis. *Journal of Governance and Local Politics*, 7(1), 22–35. Article Text-9755-1-10-20250516.pdf
- Sataloff, R. T., & Vontela, S. (2021). Response Rates in Survey Research. *Journal of Voice*, 35, 683-684. <https://doi.org/10.1016/j.jvoice.2020.12.043>
- Saunders, M., Lewis, P., & Thornhill, A. (2020). *Research Methods for Business Students*. Pearson Education.
- Schein, E. H. (1990). Organizational culture. *American Psychologist*, 45(2), 109-119. doi:10.1037/0003-066X.45.2.109
- Scholkmann, A. B. (2020). Resistance to (digital) change: Individual, systemic and learning-related perspectives. In *Digital transformation of learning organizations* (pp. 219–236). Springer. https://doi.org/10.1007/978-3-030-55878-9_13
- Shapiro, S.S. & Wilk, M.B. (1965) An Analysis of Variance Test for Normality . *Biometrika*, 52, 591-611. <https://doi.org/10.1093/biomet/52.3-4.591>.
- Shiri, R., El-Metwally, A., Sallinen, M., Pöyry, M., Härmä, M., & Toppinen-Tanner, S. (2023). The role of continuing professional training or development in maintaining current employment: A systematic review. *Healthcare*, 11(21), 2900. <https://doi.org/10.3390/healthcare11212900>
- Shrestha, N. (2020). Detecting multicollinearity in regression analysis. *American Journal of Applied Mathematics and Statistics*, 8(2), 39-42. <https://doi.org/10.12691/ajams-8-2-1>
- Sigudla, J., & Maritz, J. E. (2023). Exploratory factor analysis of constructs used for investigating research uptake for public healthcare practice and policy in a resource-limited setting, South Africa. *BMC Health Services Research*, 23, 1423. <https://doi.org/10.1186/s12913-023-10165-8>
- Sileyew, K. J. (2019). *Research design and methodology* Cyberspace.
- Silva, R., & Costa, F. (2021). The limits of on-demand learning: A study of training methodology and frequency in Brazilian digital government. *Latin American Journal of Management*, 13(2), 77-91. <https://doi.org/10.1108/LAMJ-10-2020-0255>

- Singh, A., Singh, H. P., Alam, F., & Agrawal, V. (2022). Role of Education, Training, and E-Learning in Sustainable Employment Generation and Social Empowerment in Saudi Arabia. *Sustainability*, 14(14), 8822-33. <https://doi.org/10.3390/su14148822>
- Singh, P., Sirpal, S., & Pal, O. (2025). Cyber resilience in e-governance: A review of strategies, challenges, and directions. *Internet of Things*, 33, Article 101702. <https://doi.org/10.1016/j.iot.2025.101702>
- Smith, J. (2020). Human Resource Training and Electronic government Implementation in Australia. *Australian Journal of Public Administration*, 79(3), 357-371. <https://doi.org/10.1111/1467-8500.12408>
- Stratton, S. J. (2021). Population research: convenience sampling strategies. *Prehospital and disaster Medicine*, 36(4), 373-374. <https://doi.org/10.1017/S1049023X21000791>
- Sürücü, L., & Maslakçı, A. (2020). Validity and reliability in quantitative research. *Business & Management Studies: An International Journal*, 8(3), 2694-2726. <https://doi.org/10.15295/bmij.v8i3.1540>
- Tadesse Bogale, A., & Debela, K. L. (2024). Organizational culture: a systematic review. *Cogent Business & Management*, 11(1). <https://doi.org/10.1080/23311975.2024.2340129>.
- Tak, C. C. (2021). Analysis validity and reliability of self-efficacy and metacognitive awareness instrument toward mathematical reasoning. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(9), 3332-3344. <https://doi.org/10.17762/turcomat.v12i9.4752>
- Tan, P., & Lim, W. (2020). Phased training for complex system adoption: A case study from Singapore. *Pacific Basin Journal of Digital Governance*, 1, 34-48. <https://doi.org/10.1007/s42981-020-00005-1>
- TechAdapt. (2023). *Virtual reality for soft-skills development in the public sector: A pilot study*. Canadian Digital Government Press.
- Thadani, V. N., & Todaro, M. P. (2019). Female migration: A conceptual framework. In J. M. Stellman & S. M. Chen (Eds.), *Women in the cities of Asia* (pp. 36–59). Routledge. <https://doi.org/10.4324/9780429267741-3>
- Thompson, K., & Williams, N. (2021). 2021 Is International Year of Responsible Project Management. *European Project Management Journal*, 11, 50-52. <https://doi.org/10.18485/epmj.2021.11.2.6>
- Tornatzky, L. G., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington Books.
- Tsagris, M., & Pandis, N. (2021). Normality test: Is it really necessary? *American Journal of Orthodontics and Dentofacial Orthopedics*, 159(4), 548–549. <https://doi.org/10.1016/j.ajodo.2021.01.003>.
- United Kingdom National Audit Office. (2021). *The effectiveness of continuous professional development in the civil service*. NAO. <https://www.nao.org.uk/wp->

content/uploads/2021/05/The-effectiveness-of-continuous-professional-development-in-the-civil-service.pdf

- United Nations Development Programme (2022). *Fostering innovation through CPD: A Jordanian case study*. United Nations Development Programme. <https://doi.org/10.13140/RG.22.2.18045.79843>
- United Nations Development Programme. (2023.). *Gender equality and women's empowerment in public administration: Jordan case study*. UNDP. <https://www.undp.org/publications/gepa-jordan-case-study>
- Utama, A. G. S. (2020). The implementation of electronic government in Indonesia. *International Journal of Research in Business and Social Science* (2147-4478), 9(7), 190-196. <https://doi.org/10.20525/ijrbs.v9i7.929>.
- Uzorka, A., Namara, S., & Olaniyan, A. O. (2022). Modern technology adoption and professional development of lecturers [Preprint]. *Research Square*. <https://doi.org/10.21203/rs.3.rs-1864746/v1>
- Uzumcu, O., & Acilmis, H. (2024). Do innovative teachers use AI-powered tools more interactively? A study in the context of diffusion of innovation theory. *Technology, Knowledge and Learning: Learning mathematics, science and the arts in the context of digital technologies*, 29(2), 1109–1128. <https://doi.org/10.1007/s10758-023-09687-1>
- Vabalas, A., Gowen, E., Poliakoff, E., & Casson, A. J. (2019). Machine learning algorithm validation with a limited sample size. *PloS one*, 14(11), e0224365. <https://doi.org/10.1371/journal.pone.0224365>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478. doi:10.2307/30036540
- Wachira, S. W., Kimani, P. K., & Maina, G. W. (2018). The Impact of Experiential Learning on Service Delivery in Huduma Centres. *Journal of Public Administration and Governance*, 8(3), 34-56. <https://doi.org/10.5296/jpag.v8i3.13579>
- Wairiuko, J. W., Nyonje, R., & Omulo, E. (2018). Human resource capacity and adoption of electronic government for improved service delivery in Kajiado County, Kenya. *International Journal of Business and Social Science*, 9(10), 94-110. http://ijbssnet.com/journals/Vol_9_No_10_October_2018/12.pdf
- Wang, L., Zhang, L., & Zhang, Y. (2022). Fostering Digital Literacy: Human Resource Training and Electronic government in China. *International Journal of Information Management*, 62, 102397. <https://doi.org/10.1016/j.ijinfomgt.2021.102397>
- Wenger, T., & Otieno, F. (2023). Organic communities of practice as a CPD mechanism in the Kenyan public service. *Knowledge Management for Development Journal*, 18(1), 22-38. <https://doi.org/10.1080/19474199.2023.2178852>
- Westreich, D. (2019). *Epidemiology by design: A causal approach to the health sciences*. Oxford University Press. <https://doi.org/10.1093/oso/9780190665760.001.0001>.

- Wolf, G. I., & De Groot, M. (2020). A conceptual framework for personal science. *Frontiers in Computer Science*, 2, 21-9. <https://www.frontiersin.org/journals/computer-science/articles/10.3389/fcomp.2020.00021/full>
- World Bank. (2024). *Upskilling cycles and digital transformation in Southeast Asia*. World Bank Group. <https://doi.org/10.1596/978-1-4648-1895-2>
- Wu, C., Zhang, K. & Zhou, X. (2022). Digital transformation, choice of competitive strategy, and high-quality development of firms: From evidence of machine learning and text analysis. *Business Management Journal*, 44, 5–22.
- Xatse, C. D., & Naong, M. N. (2025). Impact of human resource quality and motivation on service delivery in Ghana's local government. *SA Journal of Human Resource Management/SA Tydskrif vir Menslikehulpbronbestuur*, 23(0), Article a2906. <https://doi.org/10.4102/sajhrm.v23i0.2906>
- Yamane, T. (1967) *Statistics: An Introductory Analysis*. (2nd ed). Harper and Row
- Yasmeen, A., Blouch, R., & Khan, M. M. (2022). The impact of gender diversity on employees' work performance: The mediating role of interpersonal conflict. *International Journal of Management Research and Emerging Sciences*, 12(3). <https://doi.org/10.56536/ijmres.v12i3.215>
- Zahra, S. A. (2021). The resource-based view, resourcefulness, and resource management in startup firms: A proposed research agenda. *Journal of Management*, 47(7), 1841-1860. <https://doi.org/10.1177/01492063211018505>
- Zhang, J., Long, J., & von Schaewen, A. M. E. (2021). How does digital transformation improve organizational resilience?—Findings from PLS-SEM and fsQCA. *Sustainability*, 13(20), 11487. <https://doi.org/10.3390/su132011487>

APPENDICES

Appendix I: Application for Research Letter

Joseph Muia Kaleli
P.O. Box 30586 – 00100,
Nairobi, Kenya.

To the Managers,

HUDUMA CETRES,

P.O. BOX.....

NAIROBI

Dear Sir/madam.

RE: Request for Permission to Participate in a Research Study

I am a male student at Kenya Methodist University, currently pursuing a Doctorate of Philosophy (PhD) in Business Administration. As part of the requirements for the award of the PhD degree, I am conducting a research study titled: “Influence of Human Resource Training on the Implementation of electronic government Service Delivery in Huduma Centres, Kenya.”

I kindly request your assistance and permission to carry out this study using your commercial state-owned corporation as a case study. I assure you that all information collected will be treated with the utmost confidentiality and used solely for academic purposes. No individual firm or respondent will be identified by name in the study, its findings, or its recommendations.

This study is expected to provide valuable insights that will directly benefit the participating firms. I also commit to sharing the final findings and recommendations with any participating organization that wishes to review the final report.

Thank you for considering my request. I look forward to your positive response.

Yours sincerely,

Joseph Muia Kaleli

Kenya Methodist University.

Researcher: Email: josephkaleli@yahoo.com, Tel. +254 795 033240.

Appendix II: Research Questionnaire for Managers

Instructions

This questionnaire is divided into seven parts. Part one requires general information while the other parts seek information on the research variables. Kindly do not write your name anywhere in this study. Please respond to questions by ticking (✓) against the appropriate information and writing appropriate answer in blank spaces.

Section A: Background Information

1. Age:

18-25 years [] 26-35 years []
36-45 years [] 46-55 years [] 55+ years []

2. Gender:

Male [] Female []

3. Educational Qualification:

College Certificate [] Diploma []
Bachelor's degree [] Master's degree or above []

4. Years of Experience:

Less than 1 year [] 1-5 years []
6-10 years [] 11-15 years [] 16+ years []

SECTION B: THE INFLUENCE OF HUMAN RESOURCE DETERMINANTS ON THE IMPLEMENTATION OF ELECTRONIC GOVERNMENT SERVICE DELIVERY IN HUDUMA CENTRES, KENYA

Part A: Influence of Training Methods (TM)

7. Please use the point scale below to indicate your level of agreement by ticking each one of the given statements. 1= Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree,

1		2		3		4		5			
Strongly disagree		Disagree		Neutral		Agree		Strongly Agree			
	Opinion						1	2	3	4	5
1	I often receive practical on-the-job training that helps improve my daily service delivery performance.										

2	Structured classroom-based training programs equip me with knowledge relevant to digital government service provision.					
3	Online training modules are accessible and support my understanding of new government service delivery technologies.					
4	I receive regular mentorship and coaching from senior colleagues on improving digital service processes.					
5	Simulation and role-play training sessions help me confidently handle real-life scenarios in service delivery.					
6	Training methods used at Huduma Centres match the current digital service delivery challenges we face.					
7	Mentorship programs encourage learning and application of electronic government platforms in my work routines.					
8	E-learning platforms are user-friendly and allow me to learn without affecting my daily service responsibilities.					
9	I find hands-on practical sessions more effective than theory-based training for skill acquisition.					
10	Role-play exercises during training enhance my confidence in customer engagement using digital platforms.					

Part B: Influence of Training Frequency

4. Please use the point scale below to indicate your level of agreement by ticking each one of the given statements.

	1	2	3	4	5
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	Opinion				
	1	2	3	4	5
1	Monthly training sessions are held consistently and address recent changes in service procedures and technologies.				
2	I attend quarterly refresher courses that improve my competence in handling system updates and upgrades.				
3	Annual training programs are provided and align with strategic objectives for quality service improvement.				
4	Emergency training sessions are quickly organized whenever new platforms or procedures are introduced unexpectedly.				
5	I believe the frequency of training is adequate to maintain high-quality electronic government service delivery.				
6	Regular capacity-building initiatives enable us to remain competent and responsive to customer needs.				
7	The frequency of training has a direct impact on the efficiency of services we provide.				

8	My team frequently participates in refresher courses which help improve teamwork in service provision.					
9	On-demand training sessions are accessible to address individual learning needs and immediate technical gaps.					
10	Frequent training empowers staff to adapt easily to new government digital platforms and service demands.					

Part C: Influence of Continuous Professional Development (CPD)

6. Please use the point scale below to indicate your level of agreement by ticking each one of the given statements.

1		2		3		4		5	
Strongly disagree		Disagree		Neutral		Agree		Strongly agree	
	Opinion								
1	I have pursued ICT certifications that enhance my skills in delivering electronic government services effectively.								
2	I frequently attend relevant workshops and seminars that build my competence in digital governance systems.								
3	Continuous professional development opportunities improve my chances of career growth and internal promotion.								
4	My learning needs are regularly assessed to design effective training and development interventions.								
5	Management supports professional development through funding and encouragement for relevant courses and certifications.								
6	Training and development opportunities offered are relevant and timely to address current service gaps.								
7	Participation in accredited programs increases my confidence in handling citizen queries using e-platforms.								
8	CPD has significantly contributed to the efficiency of my department in delivering quality services.								
9	Regular evaluation of training outcomes is done to align development with job-specific requirements.								
10	I feel supported by leadership in advancing my qualifications to enhance work-related digital competence.								

Part D: Technological Infrastructure

6. Please use the point scale below to indicate your level of agreement by ticking each one of the given statements.

	1	2	3	4	5
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	Opinion				1 2 3 4 5
1	Huduma Centres have modern computers, printers, and systems that facilitate smooth electronic government service delivery.				
2	Our systems are reliable and rarely experience downtimes that interrupt service delivery processes.				
3	Internet connectivity is stable and sufficient to support uninterrupted access to all electronic government platforms.				
4	Integration of systems across departments improves efficiency in delivering combined services to citizens.				
5	IT support is readily available whenever we experience technical difficulties in our workstations.				
6	Modern software solutions are regularly updated to ensure smooth and efficient service provision.				
7	System interoperability allows real-time communication between departments and enhances customer experience.				
8	Maintenance of hardware and software systems is conducted routinely to avoid sudden breakdowns.				
9	New ICT tools are introduced regularly to enhance the quality of public services.				
10	Access to high-speed broadband significantly improves the speed at which we process service requests.				

Part E: Mediating Role of Organizational Culture (OC)

7. Please use the point scale below to indicate your level of agreement by ticking each one of the given statements.

	1	2	3	4	5
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
	Opinion				1 2 3 4 5
1	We have shared values that support customer-centered service and adoption of digital solutions.				
2	The work environment encourages innovation and learning from both success and failure.				
3	Departments collaborate effectively in addressing challenges in electronic government service delivery.				

4	Leaders clearly communicate training goals and expectations to all staff members.					
5	Employees are enthusiastic and committed to delivering efficient government services digitally.					
6	Organizational culture supports change and encourages testing of new service delivery approaches.					
7	Leadership provides open forums where staff ideas on improving services are appreciated.					
8	We value teamwork and constantly work together to solve digital service-related problems.					
9	I feel respected and supported in my contributions to digital transformation at work.					
10	The organization appreciates feedback and uses it to improve digital service delivery practices.					

Part F: Implementation of Electronic government Service Delivery (E-GSD)

7. Please use the point scale below to indicate your level of agreement by ticking each one of the given statements.

1		2		3		4		5					
Strongly disagree		Disagree		Neutral		Agree		Strongly agree					
	Opinion								1	2	3	4	5
1	Citizens can access government services easily at Huduma Centres using digital systems.												
2	Requests for IDs, certificates, or licenses are processed faster through online systems than manually.												
3	Customer feedback mechanisms like surveys and ratings are used to improve service quality.												
4	Digital service platforms have reduced the need for face-to-face customer service visits.												
5	The systems maintain secure, accurate, and updated citizen records with minimal manual errors.												
6	Digital systems are increasingly being adopted by citizens for different types of government services.												
7	Turnaround time for applications and approvals has improved significantly through digital platforms.												
8	We regularly analyze user feedback to enhance the effectiveness of digital service platforms.												
9	More citizens are using online services compared to walk-in counters in recent months.												
10	Automated records and workflows reduce paperwork and errors in daily service operations.												

Thank you for your assistance

Appendix III: Interview Questions for Top Management at Huduma Centres

Training Methods

1. How would you describe the current training methods used to prepare staff for delivering electronic government services?
2. In your view, which training method (e.g., on-the-job training, workshops, simulations) has been most effective, and why?
3. What challenges have you experienced with the current training methods in ensuring effective service delivery?
4. How is the choice of training method aligned with the technological demands of electronic government platforms?

Training Frequency

1. How often are staff trained on electronic government service delivery systems and processes?
2. In your opinion, how does the frequency of training affect staff competency and service delivery quality?
3. Are there regular assessments to determine the need for refresher training? If so, how are these implemented?
4. What constraints, if any, affect the ability to conduct regular training for Huduma Centre staff?

Continuous Professional Development (CPD)

1. What CPD initiatives are in place to support long-term staff capacity in electronic government service delivery?
2. How does your organization ensure that CPD is aligned with changes in digital governance and citizen expectations?
3. What role does management play in motivating staff to participate in CPD programs?
4. Can you share examples of how CPD has improved service delivery performance in your centre?

Influence of Technological Infrastructure

1. How would you assess the adequacy and reliability of technological infrastructure supporting electronic government services at your Huduma Centre?
2. What investments have been made to ensure the infrastructure supports staff training and service implementation?
3. How does the availability (or lack) of technological tools impact staff performance post-training?
4. Are there strategies in place to update infrastructure to match evolving digital service requirements?

Mediating Role of Organizational Culture

1. How would you describe the organizational culture within your Huduma Centre in relation to embracing training and innovation?
2. In what ways does organizational culture influence the implementation of training outcomes into service delivery?
3. What strategies are used to align training programs with the core values and attitudes of staff?
4. How does leadership promote a culture that supports learning and adaptation to electronic government processes?

Implementation of Electronic government Service Delivery

1. How do you measure the effectiveness of electronic government service delivery within your Huduma Centre?
2. What are the main challenges facing the full implementation of electronic government services?
3. How do trained human resources contribute to improved citizen satisfaction and service delivery efficiency?

Appendix III: Authorization Letter



KENYA METHODIST UNIVERSITY

P. O. Box 267 Meru - 60200, Kenya

Fax: 254-64-30162

Tel: 254-064-30301/31229/30367/31171

Email: deanrd@kemu.ac.ke

DIRECTORATE OF POSTGRADUATE STUDIES

Our Ref: KEMU/NACOSTI/BUS/27/2025

April 11, 2025

Commission Secretary
National Commission for Science, Technology and Innovations
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,

RE: JOSEPH MUIA KALELI-BUS-4-0460-1/2020

This is to confirm that the above named is a bona fide student of Kenya Methodist University, in the Department of Business Administration, undertaking PhD in Business Administration. He is conducting research on; *"Influence of Human Resource Training on the Implementation of E-Government Service Delivery in Huduma Centers, Kenya"*. We confirm that his research proposal has been defended and approved by the University.

In this regard, we are requesting your office to issue a research license to enable him collect data.

Any assistance accorded to him will be highly appreciated.

Yours sincerely,

Dr. Nancy Rinfari (PhD)
Director, Board of Postgraduate Studies

Cc: Dean, School of Business
CoD, Business Administration
Postgraduate Coordinator - BA
Supervisors



KENYA METHODIST UNIVERSITY

P. O. BOX 267 MERU - 60200, KENYA
TEL: 254-064-30301/31229/30367/31171

FAX: 254-64-30162
EMAIL: info@kemu.ac.ke

Our Ref: KeMU/ISERC/BUS/27/2025

April 10, 2025

JOSEPH MUIA KALELI
BUS-4-0460-1/2020

Dear Joseph,

SUBJECT: INFLUENCE OF HUMAN RESOURCE TRAINING ON THE IMPLEMENTATION OF E-GOVERNMENT SERVICE DELIVERY IN HUDUMA CENTERS, KENYA

This is to inform you that Kenya Methodist University Institutional Scientific Ethics and Review Committee has reviewed and approved your research proposal. Your application approval number is KeMU/ISERC/BUS/27/2025. The approval period is 10th April, 2025 – 10th April, 2026.

This approval is subject to compliance with the following requirements:-

- I. Only approved documents including (informed consents, study instruments, MTA) will be used.
- II. All changes including (amendments, deviations, and violations) are submitted for review and approval by Kenya Methodist University Institutional Scientific Ethics and Review Committee.
- III. Death and life-threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to KeMU ISERC within 72 hours of notification.
- IV. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to KeMU ISERC within 72 hours.
- V. Clearance for export of biological specimens must be obtained from relevant institutions.

- VI. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- VII. Submission of an executive summary report within 90 days upon completion of the study to KeMU ISERC.

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://oris.nacosti.go.ke> and also obtain other clearances needed.

Yours sincerely,



MR. HERBERT KIBEBE
CHAIR ISERC

Appendix IV: Research Permit

 REPUBLIC OF KENYA National Commission for Science, Technology and Innovation Ref No: 885827	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION Date of Issue: 23/May/2025
RESEARCH LICENSE	
	
This is to Certify that Mr. JOSEPH MUIA KALELI of Kenya Methodist University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Baringo, Bomet, Bungoma, Busia, Elgeyo-Marakwet, Embu, Garissa, Homabay, Isiolo, Kajiado, Kakamega, Kericho, Kiambu, Kilifi, Kirinyaga, Kisii, Kisumu, Kitui, Kwale, Laikipia, Lamu, Machakos, Makueni, Mandera, Marsabit, Meru, Migori, Mombasa, Murang'a, Nairobi, Nakuru, Nandi, Narok, Nyamira, Nyandarua, Nyeri, Samburu, Siaya, Taita-Taveta, Tanariver, Tharaka-Nithi, Transzoia, Turkana, Uasin-Gishu, Vihiga, Wajir, Westpokot on the topic: INFLUENCE OF HUMAN RESOURCE TRAINING ON THE IMPLEMENTATION OF E-GOVERNMENT SERVICE DELIVERY IN HUDUMA CENTRES, KENYA for the period ending : 23/May/2026.	
License No: NACOSTI/P/25/4173811	
Applicant Identification Number: 885827	
Signature:  Deputy Director NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION	
Verification QR Code 	
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	
See overleaf for conditions	

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to.
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
 - i. Endanger national security
 - ii. Adversely affect the lives of Kenyans
 - iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
 - iv. Result in exploitation of intellectual property rights of communities in Kenya
 - v. Adversely affect the environment
 - vi. Adversely affect the rights of communities
 - vii. Endanger public safety and national cohesion
 - viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. Neither the license nor any rights thereunder are transferable.
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

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