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STRATEGIC MANAGEMENT

DIGITAL COMPETENCIES AND PUBLIC SERVICE DELIVERY EFFECTIVENESS: INSIGHTS FROM HUDUMA CENTRES IN NAIROBI METROPOLITAN AREA, KENYA

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ABSTRACT

Purpose of the study: The study examined the effect of digital competencies on public service delivery effectiveness among Huduma Centres in the Nairobi Metropolitan Area, Kenya.

Research methodology: The study was grounded on a pragmatic philosophical paradigm and informed by the Diffusion of Innovations Theory. An explanatory mixed-methods design was adopted targeting 13,796 individuals in nine Huduma Centres in Nairobi, Kiambu, Machakos and Kajiado counties. A stratified sampling approach based on Cochran's formula resulted in a sample size of 549 respondents. Primary data were collected using semi-structured questionnaires, reliability and validity of which were ensured using Cronbach's alpha, factor analysis and expert validation. Quantitative data were analysed using descriptive statistics, Pearson correlation and regression whereas qualitative data using thematic analysis.

Findings: The study found that digital competencies had a significant positive effect on service delivery ($\beta = 0.481$, $p = 0.000$), explaining 30.4% of the variance, with descriptive results showing high staff confidence ($M = 4.39$, $SD = 0.62$) but relatively lower competency adequacy ($M = 4.13$, $SD = 0.40$), indicating inconsistencies in training depth and quality across centres.

Conclusion: The study concludes that digital competencies significantly enhance service delivery effectiveness, yet systematic gaps in training consistency and competency standardisation across Huduma Centres require immediate institutional intervention.

Recommendations: The study recommends that Huduma Centres should implement standardized digital competency training, enforce minimum literacy and certification standards, institutionalize mentorship, and ensure all system upgrades are preceded by mandatory staff training to achieve consistent and effective service delivery.

Keywords: *Digital Competencies, service delivery, Huduma Centres, Kenya*

BACKGROUND TO THE STUDY

Effective public service delivery in the digital age depends not only on technological systems but critically on employees' digital competencies, which determine how effectively these systems are utilized to enhance service quality (Ha, 2022; Rupeika-Apoga et al., 2022; Zong et al., 2022; Yesmin et al., 2023). Ghobakhloo and Iranmanesh (2021) state that digitally skilled employees are more likely to adapt to technological changes and take advantage of new systems effectively, while Haug et al. (2024) confirm that institutions with strong digital literacy cultures have less disruption and demonstrate higher service innovation. Without competent staff, even the most sophisticated of digital infrastructure is a liability rather than an enabler of responsive, accessible and satisfying public services.

The identification of digital competencies as a strategic public sector asset has received a lot of momentum worldwide, especially as governments expand their e-government and digital services platforms. The development of digital skills of the workforce is classified by the Organisation for Economic Cooperation and Development (OECD) (2024) among the most important governance investments with many countries rolling out digital systems at a faster pace than their civil servants can put them to use leading to a constant performance gap between the availability of the systems and the quality of services. Mankevich et al. (2023) confirm this paradox in their study of Nordic public sector institutions and find that demand for digital competence within public administration has increased much faster than the supply of formal training. Martinez-Pelaez et al. (2023) go further to prove that digital competency deficits lead to measurable degradations in service responsiveness, accountability and citizen satisfaction, regardless of the quality of the infrastructure. These global patterns highlight the need for digital transformation strategies to invest equally in people and systems in order to create long lasting improvements in public service effectiveness.

Across Asia, there is growing empirical evidence that digitally competent civil servants are one of the best predictors of the quality of public service delivery. In Indonesia, Ingsih, Astuti and Riyanto (2024) using structural equation modelling of 262 civil servants concluded that digital competence directly improved smart service delivery and employee performance with technological skills promoting greater adaptability and responsiveness at the citizen interface. Nur (2024) similarly showed that digital-era competencies such as creativity, emotional intelligence and cognitive flexibility had a significant impact on service adaptability in Indonesian civil service. Stevani and Muafi (2024) proposed job satisfaction as a mediating

variable and found that digital competency and digital leadership had significant positive effects on service performance. These findings in Asia show a consistent positive association between competency development and better service outcomes, pointing towards a direct pathway from competency development to better service outcomes, and showing that the effects of competency are magnified when there is a supporting institutional culture and policy frameworks that support ongoing learning.

In Sub-Saharan Africa the picture is characterised by significant deficits of competency that compromise the effectiveness of investments in digital public services. Bwalya and Mutula (2020) in documenting across five African nations that lack of structured digital training was limiting public sector innovation, institutional inertia and weak knowledge sharing mechanisms were found to be pervasive barriers. In Nigeria, Omotosho and Emwanu (2019) found through regression analysis of 300 government employees that poor digital literacy was a significant constraint to the utilization of e-government platforms ($R2 = 0.62$, $p < 0.01$). Amaewhule and Nwadike (2024) in a study of 362 lecturers in Nigerian public universities, confirmed that there were significant gaps in content creation and problem-solving demonstrated by staff that were attributed to inadequate training.. In Tanzania, Lwoga and Sangeda (2021) using structural equation modelling of 250 public servants found that digital proficiency significantly improved service innovation and service timeliness ($b = 0.68$, $p < 0.05$) and confirms that competency investment pays off in terms of service delivery returns.

Within the East African context, research exists on the promise and institutional gaps of digital competency in the public service. Mtebe and Raisamo (2021) using regression analysis of 200 ICT officers found that continuous training had a significant impact on the reliability of service ($R2 = 0.74$), highlighting the importance of structured capacity building programmes. In Kenya, Kamau et al. (2022) determined through a descriptive survey of 180 employees at Huduma Centre that digital competency levels showed a significant correlation with timely and accurate service delivery ($p < 0.001$), with centres that have regular training programs reporting more than thirty percent improvement in task completion. Osundwa (2024) further confirmed in a survey of 250 respondents that digital competencies were also one of the strongest predictors of service delivery quality at Huduma Centres in Nairobi, together explaining sixty-six percent of the variance in service delivery joint with the use of ICT resources and organisational influences, reinforcing that human capital is at least as influential as technology in influencing citizen service outcomes.

In Kenya, studies conducted within Huduma Centres reveal persistent digital competency gaps that undermine service access and user satisfaction, with evidence showing inconsistent training in handling biometric systems and interlinked platforms such as Immigration, NTSA, and the Registrar of Persons, while existing research confirms that although training improves service outcomes, it has largely been examined within narrow human resource frameworks rather than integrated digital transformation models (Nyamai & Njagi, 2023; Mutegi, 2021). Njiru and Kinyanjui (2023) further ensured through quasi-experimental assessment of 210 Huduma Centre employees the effectiveness of structured digital training in improving task completion by twenty-five percent and reducing customer complaints by twenty percent, giving direct evidence that competency investment leads to measurable and quick service delivery gains at the facility level.

Despite converging evidence on the importance of digital competencies, there remains a critical empirical gap. Most available research addresses digital competencies in isolation from structural and policy conditions that facilitate or inhibit their effectiveness, and few have disaggregated their impact within a single framework of service delivery dimensions of accessibility, timeliness, and user satisfaction. The Kenya Digital Masterplan 2022-2032 outlines human capital development as one of the pillars of the national digital transformation, setting training requirements and ICT literacy standards for civil servants in government institutions (ICT Authority, 2022). However, the degree to which these mandates have been operationalised within Huduma Centres and whether or not they have improved outcomes in service delivery in any way is empirically unresolved. This study addressed this gap by determining the effect of digital competencies on public service delivery effectiveness among Huduma Centres in Nairobi Metropolitan Area, Kenya.

STATEMENT OF THE PROBLEM

Kenya's Huduma Centres struggle with persistent service delivery failures characterised by limited accessibility, long wait times and inconsistent citizen satisfaction (Nurfadilah et al., 2024; Sihombing et al., 2024). A core but often underestimated cause for these failures is inadequate digital competencies of public servants and their impact on sub-standard, unreliable and responsiveness of services rendered to citizens (Idrus et al., 2024; Koech & Bett, 2023). When staff are not equipped to use integrated digital platforms effectively, even well-equipped centres are not delivering quality outcomes, resulting in risk of public distrust, rising costs of

operations and perpetuating inequalities in service provision within the Nairobi Metropolitan Area (Filgueiras et al., 2019; Nurfadilah & Haliah, 2024).

Huduma Centres, established in 2013, have experienced increasing operational inefficiencies driven by rising service demand that has outpaced investment in workforce digital capacity (Koech et al., 2023; Sihombing et al., 2024). Improving digital competencies through better training, hiring of skilled professionals, and continuous learning is widely recognised as being necessary to address these gaps (Kirana & Majid, 2022). However, empirical studies on digital transformation in public service delivery have mainly been conducted in developed country contexts, leaving large gaps on competency-driven service delivery failures in Kenya's devolved governance framework (Kasmiah et al., 2024; Khisro, 2020). Furthermore, the existing literature tends to ignore the moderating role of policy frameworks such as the Kenya Digital Masterplan 2022-2032 in determining how digital competencies are translated into better service delivery outcomes, leaving a conceptual gap that limits the actionability of existing findings for Kenyan policymakers (Latupeirissa et al., 2024; Odhiambo et al., 2019).

The operationalization of the Kenya Digital Masterplan 2022-2032 as the government policy instrument to guide digital transformation was meant to fill persistent competency and service delivery gaps across public institutions (Koech & Bett, 2023; Latupeirissa et al., 2024). Nevertheless, the degree to which this framework has improved staff digital competencies and as a result, the effectiveness of service delivery in Huduma Centres is still underexplored and this is a significant gap in knowledge and practice (Larasati et al., 2022; Setyawan, 2024; Sihombing et al., 2024). Addressing these empirical, contextual, and conceptual gaps is important to promote knowledge in line with Kenya Vision 2030 and the Sustainable Development Goals (Li et al., 2024; Nurfadilah et al., 2024). This study examined the effect of digital competencies on the effectiveness of service delivery, providing policy recommendations that will help policymakers optimise workforce development efforts and provide better assurance of citizen satisfaction across Huduma Centres within the Nairobi Metropolitan Area

RESEARCH OBJECTIVE

To determine the effect of digital competencies on public service delivery effectiveness among Huduma Centres in Nairobi Metropolitan Area, Kenya

HYPOTHESIS

H_0: There is no statistically significant effect of digital competencies on service delivery among Huduma Centres in Nairobi Metropolitan Area, Kenya

LITERATURE REVIEW

This chapter presents the literature review and is discussed in sections.

Theoretical Review

The study was anchored on the Diffusion of Innovations (DOI) Theory by Rogers (2003), which provides a framework for understanding how digital competencies are acquired, embedded, and diffused across public institutions to enhance service delivery outcomes. DOI postulates that innovations are transmitted over time across social systems through certain channels, and adoption is influenced by five key attributes: relative advantage, compatibility, complexity, trialability, and observability (Agafonova et al., 2021; Idrus et al., 2024). In this paper, digital competencies are the innovation whose adoption by the Huduma Centre staff is the direct determinant of the quality-of-service delivery to citizens. The theory is especially relevant in that it explains why some staff are more amenable to digital tools than others and how structured training and institutional support helps to speed up the diffusion of competency across service delivery teams, ultimately improving the dimensions of accessibility, timeliness, and user satisfaction at Huduma Centres in the Nairobi Metropolitan Area.

The relevance of DOI to this study is further enhanced by its applicability in the context of public sector capacity development. Latupeirissa et al. (2024) confirm that diffusion of digital innovations in public service is dependent on perceived relative advantage, compatibility with existing workflows, which is directly related to the way training programs are designed at Huduma Centres. Orton et al. (2018) establish that inconsistencies in public service outcomes can be explained through innovation diffusion mechanisms, reinforcing the fact that staff acceptance and competency utilisation were central to performance. Government policy, operationalised through the Kenya Digital Masterplan 2022-2032, works inside DOI as an institutional catalyst for accelerating competency diffusion through the creation of training mandates and creating conducive adoption environments (Helfat et al., 2014; Liu et al., 2015). Together, these dynamics make DOI a coherent and empirically grounded theoretical base for investigation of effectiveness of service delivery by digital competencies at Huduma Centres in the Nairobi Metropolitan Area.

Empirical Literature Review

Digital competencies that include the knowledge, skills and attitudes needed to make effective use of digital technologies are increasingly recognised as important enablers of efficient and citizen-centric service delivery. In the field of public administration, digital competence enables public administration employees to navigate platforms, handle data in a secure way, and adapt to new technologies. Governments across the world incorporate competency development programmes as part of wider digital transformation strategies, but most research has focused on these skills in isolation, ignoring interactions with infrastructural, organisational and policy dimensions. Omotosho and Emwanu (2019) used a quantitative survey of 300 Nigerian government employees and established a strong positive relationship between digital literacy and efficiency in service delivery ($R2 = 0.62$, $p < 0.01$), finding that inadequate competencies constrained the utilization of the platform. Bwalya and Mutula (2020) in a similar study across five Sub-Saharan African countries found that lack of structured training was a significant limiting factor to public sector innovation, with institutional inertia and poor knowledge-sharing mechanisms being identified as persistent barriers to service effectiveness.

Beyond Africa, research in Indonesia and East Africa has repeatedly confirmed that workforce digital capacity is one of the key predictors of the effectiveness of public service delivery. Ingsih, Astuti, and Riyanto (2024) using structural equation modelling of 262 civil servants in Central Java found that digital competence was directly related to smart service delivery, where technological skills created the adaptability of citizen interface. Nur (2024) further showed that digital era competencies such as creativity, emotional intelligence, and cognitive flexibility had a significant effect on service adaptability in Indonesian civil service. Stevani and Muafi (2024) through SmartPLS analysis of 100 respondents, digital competency and digital leadership jointly had significant positive impacts on service performance with job satisfaction as a partial mediator. In Tanzania, Lwoga and Sangeda (2021) found that digital proficiency had a significant positive impact on service innovation and timeliness among 250 public servants ($b = 0.68$, $p < 0.05$) confirming that investments in competency pay for service delivery.

In East Africa, Mtebe and Raisamo (2021) used a mixed methods design with 200 ICT officers and found that continuous training significantly contributed to service reliability ($R2 = 0.74$) using regression and thematic analysis. In India, Kulal et al. (2024) found that AI-driven platforms led to improved citizen services but only twenty-five per cent of organisations had

adequate staff capability to support these systems, which confirms that digital literacy is a prerequisite to maximising technology impact.

Studies done directly in Kenyan Huduma Centres provide the most contextually relevant evidence for this paper. Kamau et al. (2022) through a descriptive survey of 180 Huduma Centre employees, found that there was a significant correlation between higher digital competency levels and timely and accurate service delivery ($p < 0.001$), with centres reporting regular training with over thirty percent improvement in task completion. Osundwa (2024) confirmed through a descriptive survey of 250 respondents that staff digital competencies were one of the strongest predictors of the quality of service delivery at Nairobi Huduma Centres, together explaining sixty-six percent of the variance in service delivery, alongside ICT resources. Mutegi (2021) examined human resource practices in fifty two Huduma Centres in Kenya and found that employee training and recruitment had a significant impact on service outcomes, although the research was limited to human resource frameworks and did not place competencies within a larger digital transformation model moderated by government policy. The Kenyan evidence adds to the evidence of the direct impact that structured digital competency training is having on service delivery outcomes. Njiru and Kinyanjui (2023) performed a quasi-experimental research on 210 employees of Huduma Centre and established that structured digital training improved task completion by twenty-five percent and customer complaints by twenty percent. Njiru et al. (2023) complemented this through a longitudinal study in four Huduma Centres and found that the regular digital literacy programs had a significant effect on service accuracy and customer satisfaction ($F = 4.98$, $p = 0.016$).

Conceptual Framework

Figure 1 presents a conceptual framework.

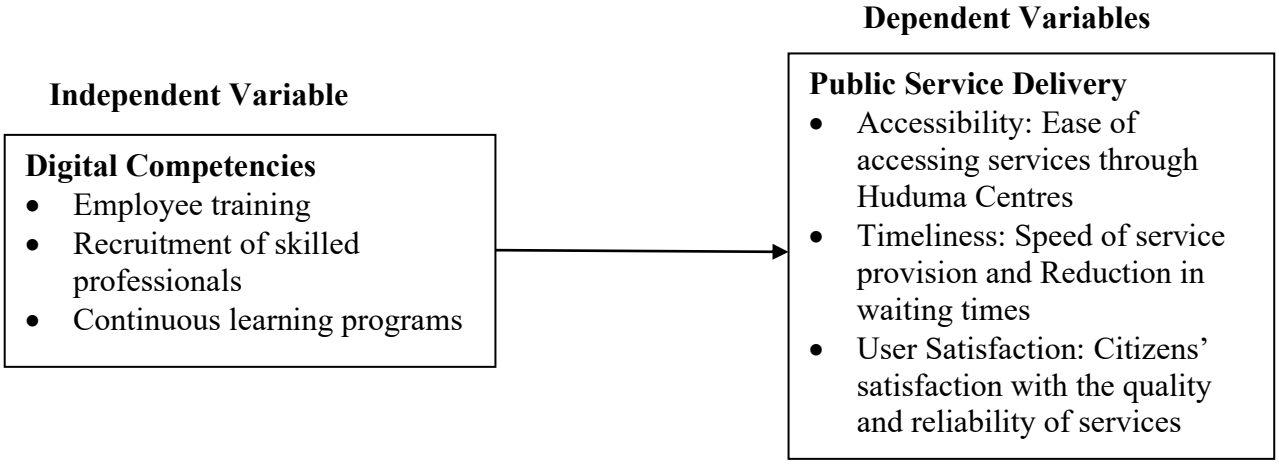

Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

The study was anchored in a pragmatic philosophical orientation that informed the selection of an explanatory mixed-methods design, enabling the integration of quantitative and qualitative approaches to examine the effect of digital competencies on service delivery in Huduma Centres. A stratified sample of 549 respondents drawn from a population of 13,796 employees and customers across nine Huduma Centres in Nairobi, Kiambu, Machakos, and Kajiado counties was selected using Cochran's (1977) formula to ensure representativeness. Data were collected using semi-structured questionnaires, with quantitative analysis conducted through descriptive statistics, Pearson correlation, and simple linear regression, while qualitative data were analysed thematically to enrich interpretation. Ethical standards including informed consent, confidentiality, and compliance with the Kenya Data Protection Act 2019 were strictly upheld following approval from Daystar University ISERC and NACOSTI.

DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

This section presents the data presentation, analysis and discussion of findings.

Pretesting of the Research Instrument

Pretesting of the research instrument was carried out at Huduma Centre Nakuru and Huduma Centre Naivasha. 17 employees and 38 customers were involved in the pretesting, with a total of 55 respondents representing ten percent of the planned main study sample of 549. These respondents were excluded from the main study on purpose, to avoid contamination of results. The main goal of the pretest was to evaluate the validity and reliability of the items in the questionnaire that measures digital competencies and service delivery prior to full-scale data collection. Construct validity was determined with the help of Kaiser-Meyer-Olkin measures of sampling adequacy and Bartlett's Test of Sphericity. Digital competencies showed a particularly high KMO value of 0.740 and a significance of 0.000, the highest of all constructs, indicating very good sampling adequacy and good inter-item correlations. The service delivery constructs of accessibility, timeliness and user satisfaction recorded KMO values of 0.626, 0.579 and 0.620 respectively, all exceeding the minimum threshold of 0.5 and confirming factorial suitability.

Factor analysis supported the construct validity of both digital competencies and service delivery items, with all 21 questionnaire items having extraction values above the recommended 0.4 threshold (Stevens, 2002). Digital competencies items obtained extraction

values ranging from 0.863 to 0.940, which indicates a good item-construct alignment. Service delivery items across accessibility, timeliness, and user satisfaction obtained extraction values ranging from 0.806 to 0.909, confirming that all items sufficiently captured their constructs. Face validity was established through supervisor review and participant feedback with all 55 pretest respondents confirming competency-related items were clearly worded and relevant to their daily experiences of platform operation at Huduma Centres. Content validity was determined by systematic supervisor evaluation of all questionnaire items (Carmines & Zeller, 1979). Reliability testing using Cronbach's alpha produced a reliability score of 0.931 for digital competencies and an overall aggregate score of 0.842, both of which are above the acceptable threshold of 0.7 as set by Nunnally (1978), which validates all the items for retention in the main study.

Response Rate

Table 1 shows that out of 518 questionnaires distributed, 479 were returned (73.2% response rate), indicating strong participant engagement and enhancing the reliability and representativeness of the data.

Table 1: Response rate

Category	Target Respondents	Actual Respondents	Response Rate (%)
Pretest (Nakuru)	55	55	100%
Main Study	549	402	73.2%
Employees	169	138	81.7%
Customers	380	264	69.5%

Source: Field Data (2025)

The study employed rigorous methodological procedures including pretesting at Huduma Centres in Nakuru County with 55 respondents, achieving a 100% response rate that confirmed instrument validity and eliminated non-response bias. The main study recorded a strong 73.2% response rate (402 out of 549), comprising 81.7% among employees and 69.5% among customers. This indicates high participant engagement and exceeds acceptable thresholds for reliability and generalizability (Babbie, 2016; Dillman et al., 2014; Nulty, 2008). The response rate enhances the validity, representativeness, and statistical power of the findings in assessing digital competencies and service delivery outcomes within Huduma Centres in the Nairobi Metropolitan Area.

Descriptive Statistics

The objective of the study was to assess the effect of digital competencies on service delivery among Huduma Centres in Nairobi Metropolitan Area, Kenya.

Descriptive Statistics for Digital Competencies

The study evaluated digital competencies through employee training, recruitment of skilled professionals, and continuous learning programs as specified in the conceptual framework. The summary for digital competencies is presented in Table 2.

Table 2: Descriptive Statistics for Digital Competencies

Question	Mean (M)	Std. Dev. (SD)
Staff at this Centre possess adequate competencies to use digital tools.	4.13	0.40
I have received sufficient training on how to use digital platforms.	4.31	0.59
Most staff are confident when interacting with digital systems.	4.39	0.62
Overall Mean / SD	4.28	0.54

Source: Field Data (2025)

The overall mean score for digital competencies was high (M = 4.28, SD = 0.54), indicating strong agreement that digital skills are well developed across Huduma Centres, although moderate variability suggests inconsistencies in training access and confidence levels. Staff confidence in digital systems recorded the highest mean (M = 4.39, SD = 0.62), reflecting widespread comfort in system use, though the variation indicates that some staff still face challenges in navigation and troubleshooting. Training adequacy (M = 4.31, SD = 0.59) further shows that most respondents perceive training to be sufficient, but differences in delivery and frequency exist across centres. Staff competency levels, while still positively rated (M = 4.13, SD = 0.40), were comparatively lower, reinforcing the presence of gaps in depth and standardisation of digital skills among employees.

These findings are consistent with existing empirical literature which identifies digital competencies as a key driver of public sector performance. Studies by Omotosho and Emwanu (2019), Bwalya and Mutula (2020), Lwoga and Sangeda (2021), and Mtebe and Raisamo (2021) confirm that digital literacy enhances efficiency, innovation, and service reliability, while Kenyan-based studies by Kamau et al. (2022), Njiru and Kinyanjui (2023), and Njiru et al. (2023) demonstrate that structured training improves service accuracy, task completion, and customer satisfaction. The findings therefore affirm that digital competencies are central to

effective service delivery, and highlight the need for sustained investment in training, mentorship, and continuous learning to ensure consistent, efficient, and citizen-centered services across Huduma Centres.

Service Delivery

Service delivery represented the dependent variable in this study, measured across three key dimensions as specified in the conceptual framework: accessibility (ease of accessing services through Huduma Centres), timeliness (speed of service provision and reduction in wait times), and user satisfaction (citizens' satisfaction with the quality and reliability of services). The summary for service delivery is presented in Table 3

Table 3: Descriptive Statistics for Service Delivery

Question	Mean (M)	Std. Dev. (SD)
Services are easily accessible through digital platforms at this Huduma Centre.	4.24	0.56
The system enables me to deliver services without requiring citizens to make physical visits.	4.08	0.62
Digital services at this centre face minimal barriers to delivery.	4.07	0.59
Services are provided faster through digital platforms than through manual processes.	4.22	0.55
Waiting times have significantly decreased with digital service adoption.	4.24	0.56
The Centre meets expected service delivery timelines through digital systems.	4.03	0.54
Our customers are satisfied with the quality of services offered through digital platforms.	4.30	0.55
The digital service platforms are easy to use and navigate.	4.28	0.51
Our customers are satisfied with the reliability of digital services at this Huduma Centre.	4.22	0.51
Overall Mean / SD	4.19	0.56

Source: Field Data (2025)

The overall mean for service delivery was high (M = 4.19, SD = 0.56), indicating strong agreement that digital transformation has improved service delivery across Huduma Centres, although moderate variability reflects differences in experiences across locations. Customer satisfaction recorded the highest mean (M = 4.30, SD = 0.55), followed closely by platform usability (M = 4.28, SD = 0.51), suggesting that digital systems are both reliable and user-friendly, thereby enhancing the overall service experience. Accessibility and reduced waiting

times (M = 4.24) further confirm that digitalization has improved ease of access and efficiency, while the relatively lower mean for timeline adherence (M = 4.03) indicates remaining challenges in maintaining consistent service timelines across centres.

These findings align with existing literature which conceptualizes service delivery as the efficient and satisfactory provision of public services through structured institutional interactions (Alvarenga et al., 2020; OECD, 2024; Sharma et al., 2023). Empirical evidence by Idrus et al. (2024) and Tripathi et al. (2020) supports that digital systems enhance transparency, coordination, and citizen engagement, thereby improving overall performance and trust in public institutions. The current findings therefore confirm that digital transformation has significantly strengthened service delivery in Huduma Centres, as reflected in high performance across accessibility, timeliness, and user satisfaction, with regression results further demonstrating that digital practices account for a substantial proportion of service delivery outcomes.

Correlation Analysis

The correlation results are presented in Table 4.

Tabe 4: Correlation analysis

		Service delivery	Digital competencies
Service delivery	Pearson Correlation	1.000	
	Sig. (2-tailed)		
Digital competencies	Pearson Correlation	.551**	1.000
	Sig. (2-tailed)	0.000	

Digital competencies show a strong positive correlation with service delivery (r=0.551, p=0.000), suggesting that centres with well-trained staff and continuous learning programs can enhance their service delivery performance. This finding supports Kamau et al. (2022) and Njiru and Kinyanjui (2023), who found similar relationships between staff competencies and service effectiveness. The high satisfaction ratings for digital competencies, particularly staff confidence in digital systems, indicate successful capacity-building initiatives within Huduma Centres.

Regression Analysis

The objective of the study was to assess the effect of digital competencies on service delivery among Huduma Centres in the Nairobi Metropolitan Area, Kenya. Table 5 presents the model fitness results

Table 5: Model Fitness for Digital Competencies and Service Delivery

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.551a	0.304	0.299	0.2661879

a Predictors: (Constant), Digital Competencies

Source: Field Data (2025)

The R Square value of 0.304 indicates that 30.4% of the variation in service delivery can be explained by digital competencies. This suggests that the skills and training of staff play a significant role in improving service delivery outcomes, although the effect is less pronounced than that of technological infrastructure. The result highlights the importance of developing digital skills among employees to enhance service delivery.

Table 6: Analysis of Variance (ANOVA) for Digital Competencies and Service Delivery

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.203	1	4.203	59.324	.000b
	Residual	9.636	136	0.071		
	Total	13.84	137			

a Dependent Variable: Service Delivery

b Predictor: (Constant), Digital Competencies

Source: Field Data (2025)

The ANOVA results in Table 6 show a statistically significant model with F = 59.324 and p = 0.000, indicating that digital competencies significantly influence service delivery. The p-value confirms that the relationship between digital competencies and service delivery is not due to random chance.

Table 7: Regression of Coefficients for Digital Competencies and Service Delivery

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.152	0.263		8.175	0.000
	Digital Competencies	0.481	0.062	0.551	7.702	0.000

Source: Field Data (2025)

The simple regression model becomes;

$Y = 2.152 + 0.481X$

Where:

Y = Service Delivery, and

X= Digital Competencies

The regression coefficient results in Table 7 show that digital competencies have a positive and significant effect on service delivery ($\beta = 0.481$, $p = 0.000$). This indicates that for each one-unit increase in digital competencies, service delivery increases by 0.481 units. Given that the p-value is less than 0.05, we reject the null hypothesis (H_0). Thus, there is a statistically significant effect of digital competencies on service delivery among Huduma Centres in Nairobi Metropolitan Area, Kenya. This result demonstrates the critical role of employee training and digital skills in improving service delivery outcomes.

Qualitative Data Analysis

The qualitative analysis revealed that while staff in Huduma Centres have developed considerable digital competencies, inconsistencies in training and uneven skill levels across teams continue to affect service delivery, particularly during system upgrades implemented without adequate prior training, leading to temporary inefficiencies and disruptions. Employees nonetheless acknowledged that continuous learning and capacity building have improved their confidence and effectiveness, with troubleshooting ability and the integration of digital and manual processes emerging as essential competencies. From the customer perspective, staff digital competence significantly influenced satisfaction and willingness to engage with digital services, as competent staff were perceived as professional, knowledgeable, and reliable, especially when they could guide users, resolve technical issues promptly, and clearly explain procedures while assuring data security. The findings further indicate that digital competency development is an ongoing process requiring sustained institutional support, as effective service delivery depends not only on technical skills but also on adaptability, problem solving, and communication abilities, with the most effective staff demonstrating hybrid competencies that combine technical expertise with strong interpersonal skills to enhance overall service experience.

CONCLUSION

The study concludes that digital competencies have a significant positive relationship with service delivery outcomes. Digital competencies demonstrate that staff capabilities in utilizing digital technologies directly translate into improved citizen experiences and satisfaction levels. This finding supports Kamau et al. (2022) and Njiru and Kinyanjui (2023), who found similar relationships between staff competencies and service effectiveness. The high satisfaction ratings for digital competencies, particularly staff confidence in digital systems, indicate successful capacity-building initiatives within Huduma Centres. However, variability in training experiences across centres suggests the need for standardized competency development programs to ensure consistent service quality across all locations.

RECOMMENDATIONS

The study recommends that Huduma Centres should implement standardised digital competency training frameworks to ensure consistent skill levels across all staff categories, with training tailored to specific platforms such as Integrated Population Registration System, eCitizen, IFMIS, and HRMIS to enhance operational efficiency and citizen support. The ICT Authority of Kenya should establish minimum digital literacy standards and enforce a certification framework to monitor competency levels across centres, while structured mentorship programmes should be institutionalised to facilitate knowledge transfer and reduce skill disparities between experienced and new staff. In addition, digital skills development should be fully integrated within the Kenya Digital Masterplan 2022–2032 with clear timelines, funding, and accountability mechanisms to ensure effective implementation, and all system upgrades should be preceded by mandatory staff training to prevent service disruptions. County governments within the Nairobi Metropolitan Area should allocate dedicated budgets for continuous professional development in ICT units, while the National Treasury of Kenya should support public private partnerships aimed at advanced digital upskilling to align staff competencies with the evolving demands of digital public service delivery.

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