



Information Communication Technology Adoption on Service Delivery in the Ministry of Information, Communications and the Digital Economy in Kenya

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ABSTRACT

This research assessed the adoption of information communication technology by the Ministry of Information, Communications, and the Digital Economy. The study was anchored on the technology acceptance model which attributes important attributes of technology adoption to include; the availability of infrastructure and innovation inoculation. This research utilized 102 ICT employees from the Information Communication Technology Directorate employees in the Ministry of Information, Communication, and the Digital Economy. The study employed probability sampling and used the census technique to gather data. The descriptive data was analyzed by the statistical package for social sciences software which laid out the quantitative analysis of the data. The findings of the study indicate that the digitization of government services is important in leading to the digitalization or automation of various government processes and operations. The variables of this study were derived from the pillars of the Kenya master plan on information communications and technology for the period 2022 to 2032. It is recommended for further research on the foundational themes of the master plan; cyber security management, new technologies, policies and legislations and research and development. The study of these foundational themes will be important as recognized by the master plan to establish how they have impacted public service delivery.

Keywords: digital infrastructure, digital innovation and service delivery

Introduction

Xu & Tang's (2020), study on the effect of technology geared at fairness in public service delivery found that many local authorities in the United States of America had embraced collaborative 311 digital operations systems in providing public services. The study highlights that the utilization of online regimes in management has helped minority groups access government services and be regarded by the government, which in turn reduces the equity divide in public service delivery (Xu & Tang, 2020). Vogl et al. (2020), study on advanced technology and the arrival of Algorithmic protocols in the United Kingdom found that local governments are beginning to adopt advanced technologies, these advanced technologies are experiencing unforeseen effects on public management, and analytical algorithms are becoming encompassed in the conveyance of public services (Vogl et al., 2020).

Sakolkar (2023), in a thesis study on the impact of digital transformation of service delivery and public participation in the Indian government, found that automation has enhanced government access, efficacy, clarity, and citizen services. This has led to public active involvement with the government in administration and the provision of public services. The study also underlines that digital evolution has significantly impacted the quality of services being dispensed by the Indian government (Sakolkar, 2023). Oluwaseun et al. (2023) study exploring the perspectives of exceptional modern technology in strengthening public service delivery in Nigeria, found that Nigeria's public service delivery has been afflicted by underachievement that has ruined the citizens' trust in the majority of the services supplied. The study expounds that the Nigerian inferior service delivery is mainly blamed on the lack of adoption of the latest digital technology by public organizations. Modern digital technology presents techniques that can help address public service challenges, incompetency, responsibility, ineptitude, and corruption (Oluwaseun et al., 2023).

According to Wandabwa & Mutava (2023), in a study that was aimed at finding out how electronic government undertakings are resulting in better management among public institutions in low and middle-income countries, a case of the Kenya public sector found that automation of services has a significant impact on good management in public institutions. The study also found that cost-effectiveness and productiveness, openness, answerability, and consistency with the law are important elements of public administration (Wandabwa & Mutava, 2023). Information communication technology offers diverse usefulness in delivering public services. According to Kenya's national digital master plan (2022-2032), the government of Kenya has exploited information communication technology to boost the conveyance of public services, accelerate economic growth and achieve the target of positioning Kenya as a digitally enabled economy. According to the studies conducted in the international, regional and national spheres, it is observed that not much has been researched on this topic within government ministries in Kenya, based on the variables under study; digital infrastructure, digital

government service, digital skills and digital innovation. It is in this setting that this study sought to fill this gap in assessing information communication technology adoption on service delivery in the Ministry of Information, Communications and the Digital Economy.

Information and communication technology adoption in service delivery

Information and communication technology adoption in government is looked at as a hierarchical model that involves the implementation of new management ideas that have already been implemented in the business (Ziemba, 2020). In governments, technological metamorphosis necessitates a gradual change in technological operations, structure, and the people component in achieving service delivery. Indeed, technological metamorphosis in governments spreads with a ripple effect across distinct government seasons, organizational components, and procedural levels (Gong et al., 2020).

Digital Infrastructure

Digital infrastructure encompasses hardware systems, software, facilities, and service delivery such as data centres and communication networks that include, links and antennas, as well as the components necessary to operate and administer public or private environments (Gartner, 2021). Information communication technology infrastructure greatly impacts the adoption of technology in an organization. This infrastructure is required to be top-notch in current times to increase efficacy in work processes and improve the working morale of an organization's employees. (Wanjohi, 2021)

Digital Innovation

Digital innovation involves the sociotechnical characteristics of digital mechanisms, complementary material, and creative material, and the result of this creativity such as; the formation and utilization of novel products, services, and business designs (Markus & Nan, 2020). Businesses are required to invest in technology that is reliable and creates a conducive environment to make use of this technology without complexity. This will assist in encouraging business innovativeness which is equipped with the right potential and at the same time keeping in mind of pitfalls associated with the adoption process. By putting this into practice, businesses can nurture their business continuity and viability (El-Haddadeh, 2019).

Service Delivery

Citizens' contentment with public services is a measure of government performance. Guaranteeing citizens' contentment through the improved provision of public services has become the greatest objective in modern times. Citizens' contentment of public services, in general, correlates with service performance. Citizens are more satisfied when public service performance outruns their expectations (Lamsal & Gupta, 2021) Service quality is correlated to service satisfaction and citizen service contentment can be communicated relatively with service quality. The major quality factors for service quality include; the quality of being perceived by sense of touch, dependability, being able to act quickly, confidence, compassion, strength, and waiting time. Citizen service satisfaction is an indicator of government service delivery that comes up with the presumption that citizens are satisfied with the right service model (Padiyar, 2023)

Statement of the Problem

Kenya's National Treasury (MPND), report on performance appraisal of state corporations and tertiary institutions for the financial year 2021/2022, ranks the Ministry of Trade and Ministry of Information, Communications and the Digital Economy among the five worst-performing Ministries. The Ministry of Information, Communications, and the Digital Economy was ranked position 312 out of 392 Ministries, Departments, and Agencies placed on performance contracting (MPND, 2022). This report's findings were the basis of this research, and according to Kenya's national digital master plan (KNDMP), for the period 2022 to 2032, information communication technology is considered a key enabler and accelerator of economic growth and is geared to facilitate Kenya's becoming a digitally enabled economy. According to Kenya's Ministry of Public Service Performance and Delivery Management (MPSPDM), Kenya's public service transformative strategy for 2024 to 2029 seeks to transform the public service to add value to government services to the citizens. The strategy recognizes and alludes to incorporating the use of innovation and new technology to achieve these targets (MPSPDM, 2024).

Objectives of the study

General Objective

The broad objective of this research study was to assess the adoption of information communication technology in service delivery in the Ministry of Information, Communications and the Digital Economy.

Specific Objectives

- i. To examine the impact of digital infrastructure on service delivery in the Ministry of Information, Communications and the Digital Economy
- ii. To evaluate the effect of digital innovation on service delivery in the Ministry of Information, Communications and the Digital Economy

Research Questions

- i. How does digital infrastructure affect service delivery in the Ministry of Information, Communications and the Digital Economy?
- ii. What is the effect of digital innovation on service delivery in the Ministry of Information, Communications and the Digital Economy?

Literature Review**Technology Acceptance Model**

The technology acceptance model which is the anchor theory in this study, was developed by Fred Davis in the year 1989. The theory proposes that for a user to accept technology, there are two important factors to consider; perceived usefulness denoted by (PU) and perceived ease of use denoted by (PEOU) (Davis, 1989). According to Mensah (2019), dimensions of government rules and electronic government accomplishments are an important component of the perceived usefulness of electronic government services. Government operations have a positive impact on electronic government accomplishments. The perceived usefulness of electronic government services is an important forecaster that endorses the adoption of electronic government services. According to Emon (2023), some of the important factors and components in technology adoption include; perceived usefulness, perceived ease of use, social impact, favourable conditions, habits and attitudes, organizational environment, task congeniality, user skills, user collaboration, communication, and innovation attributes.

The technology adoption model which was the anchor theory of this study prescribes that for the realization of the adoption of technology in an organization, some of the important attributes to implement include; The availability of infrastructures and facilities, the enhancement of skills and proficiency for employees, and users, and the inoculation of innovation and experimentation among others, to achieve adoption. The technology adoption model gives attributes of the four study research variables, namely; digital infrastructure, digital government service, digital skills, and digital innovation. According to the Kenya national digital master plan, (2022-2032); the Kenyan digital infrastructure still faces the confrontation in digital integration, digital data hubs and the digital cloud base; lack of adequate execution of strategies, operations, enterprises, and courses of action that make it possible for the successful and logical use of digital services and data in government and the need for adequate government legislation to support individual and organizational innovation geared at enhancing service delivery by the government institutions (KNDMP, 2022-2032).

Innovation Capability Theory

The innovation capability theoretical framework developed by Lawson & Samson (2001), explains the potentiality of efficient innovators to attain success in their operations. The theory has seven major features; vision and policy, exploiting the competence construct, institutional intelligence, innovation and collaborative innovation management, Organogram structure, culture and atmospheric conditions, and the governance of technology (Lawson & Samson, 2001). According to Vu (2020), businesses can lower wastefulness and realize higher-ranking performance by coming forth with innovative capabilities. The study notes that the innovation capability model has been adopted by businesses in Vietnam effectively. The researcher suggests that every one of the capabilities incorporates numerous aspects but potentially notes that dynamic ability, innovation ability, and entrepreneurial ability are significant to altering the cutthroat competition. The author explains that this model can be adopted across different environments and countries in the world (Vu, 2020).

Chen et al. (2020), present a classification of public service innovation, based on two aspects. The innovation focus is attributed to the creation of public usefulness, elements of policy, and operational capacity. The second aspect is the innovation locus attributed to the organization's micro and macro environmental factors. The two aspects combined harness six types of innovation namely; mission, policy, administration, partnerships, the provision of public services, and the citizenry (Chen et al., 2020). The innovation capability theoretical framework notes the incorporation of institutional intelligence and innovation among the features of the theory. The two features point to digital innovation which is one of the key variables under study. This theory will explain how intrinsic organizational creativity can help in the innovation both of new service model delivery in government ministries and adding value to the service delivery models already being utilized. This is in line with the strategies spelt out by the Kenya national digital master plan 2022-2024.

Empirical Literature Review**Digital Infrastructure in Service Delivery**

Queiroz et al (2020) study that sought to investigate what benefits firms gain from digital infrastructures that help to support corporate and business strategic objectives, assumed that the effectiveness of e-infrastructure affects the business unit's competitive performance growth. The study observed that the consequence of e-infrastructure success on individual business competitiveness performance gets stronger, and its results on the particular business' achievements growth continue to weaken (Queiroz et al., 2020).

According to Ominde et al. (2021), a study sought to evaluate how the provision of information communications technology in projects in Kenya can be enhanced and found that collaboration features are important, the prominent actions to consolidate collaboration are commitment to set objectives, the ability of the key partners, the orientation of partners proficiencies, interpretation of procedures and addressing partners needs and anticipations (Ominde et al., 2021).

According to Bariu (2020) study that sought to find the status of ICT infrastructure use in teaching and learning in secondary schools that are based in Meru County in Kenya, found that there is low investment in information communication technology infrastructure due to exorbitant costs of computer hardware, computer application software, and accessories and the usage of ICT infrastructure has led to the necessity for the growth of new e-skills and abilities among teachers, school heads, and learners (Bariu, 2020)

Digital Innovation in Service Delivery

Joukhadar et al. (2023) in a study that was aimed at encouraging digital innovation for viability in the public sector in South Wales, found there exist some hurdles to digital innovation that include; Differing digital matureness, the absence of digital attitudes, decelerated mobilization, service-based repositories, hurried and haphazard problem solving, and oversight in positioning investment in digital innovation with the wide-ranging government concerns. The study employed exploratory and interpretive field study in the South Wales government which is viewed as among the leaders in automation (Joukhadar et al., 2023). This study recommends public entities embrace digital innovations in their workings to meet customer needs and service delivery. It also notes that digital innovations shouldn't be focused on financial benefits but on customer satisfaction and as a means to measure success, economic growth, and viability.

Edu et al. (2020) suggest that the deployment of digital innovation expertise helps to promote organizations and they benefit in the critical areas of managerial decision-making, these innovations help in enhancing the information technology infrastructure alignments, help in the operational activities, and the overall achievement of the organization. The study proposes a framework using a resource-based view and the capability view to explore the integration of digital capabilities to support value creation in an organization (Edu et al., 2020). The study opines the need to affiliate innovations with value added by integrating both internal and external innovations. The study recommends the need to deploy universal innovations that will be viable in the market and to the customers.

Ojiako et al. (2022) in the research aimed to examine the mechanisms required to operationalize service innovation readiness within public sector service delivery, found that there are four key knowledge management-based requirements that need to be put in place to facilitate readiness for creative services to the public. Such essential requirements include; knowledge specialty, organizational structure, understanding of change, and ingenuity (Ojiako et al., 2022). This study proposes that the public sector should be made liable and embrace innovation to maintain competency in operations and such innovation should be roots of information flow interchange.

Conceptual Framework

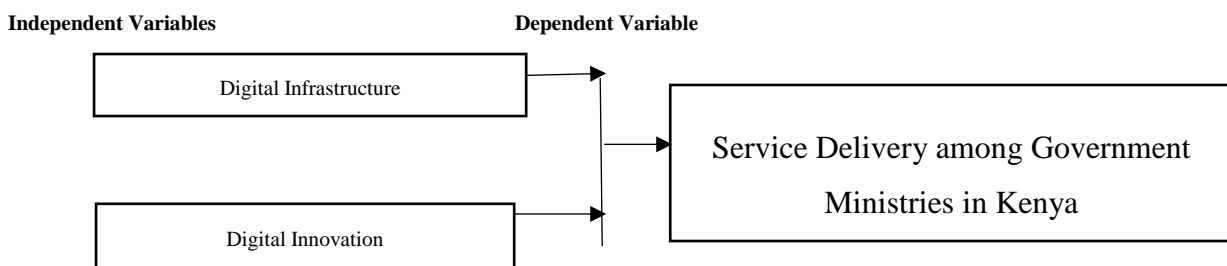


Figure 1: Conceptual Framework

Research Design and Methodology

Research Design

This study engaged a descriptive study that utilized qualitative and quantitative data. According to Taherdoost (2021), qualitative data involves nominal and descriptive non-arithmetic data while quantitative data makes use of arithmetical data that is statistically generated and computed (Taherdoost, 2021). This study engaged in qualitative and quantitative analysis that used the hybrid semi-structured questionnaire that measured the study variables' nominal, descriptive, non, and arithmetical data.

Data Instruments

This research study used qualitative and quantitative instruments to gather data by use of a semi-structured type of questionnaire. According to Mugenda & Mugenda (2019), semi-structured questionnaires combine close-ended and open-ended items and questions.

Validity

According to William (2024), validity is the extent to which a study evaluates or mirrors the hypothesis it asserts to measure. There are three categories of validity; content validity, construct validity, and criterion validity (William, 2024). According to Nha (2021), validity in quantitative research is focused on the instrument's relevance with the perceived device and the consistency of the results with reality. Nevertheless, qualitative research needs authentication and integrity. The outcomes of validity in this study benefited from measuring the four variables and confirming that the data in the questionnaires was well-grounded quantitatively and qualitatively.

Reliability test

Olayinka & Abideen (2023) define reliability as the uniformity and steadiness of the results gained from a study. The authors highlight three types of reliability tests; alternate forms, internal consistency, and inter-rater often used in management decision-making. According to Nha (2021), reliability in quantitative research emphasizes the significance of uniformity of research results which can be repeated in other contexts, whilst in qualitative research the reliability is aimed at clearness and transferability (Nha, 2021). This research study utilized ordinal and nominal data for qualitative and quantitative analysis.

Data Collection Procedure

This study used first-hand data collected from the questionnaires and empirical data by other authors in recent studies. This study assembled the primary through a partially organized questionnaire.

Analysis and Presentation

This study utilized qualitative and quantitative data to be derived from the semi-structured questionnaires. Statistical packages for the social sciences (SPSS) will be used for data analysis.

This research employed a multiple regression equation as denoted here under;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$$

Where Y = ICT adoption in service delivery?

X1 = digital infrastructure

X2 = digital innovation

Where β_1 and β_2 , are coefficients of the X independent variables and ϵ is the error term

Ethical Considerations

Mirza et al. (2023) highlight ethical considerations that need to be encouraged in qualitative research when collecting and analyzing data. The study participants need to be furnished with concise and thorough information about the purpose of the research, the intent of the study, the approaches of the study, as well as the kind of participation and any risks involved. The participants' anonymity and the privacy of their information should be safeguarded (Mirza et al., 2023). This research study encouraged the voluntary participation of all respondents and upheld a high level of confidentiality in controlling, safe custody, and communicating the data gathered from participants and disassociated information received from the respondents from the identities of the responses by using the coding system.

Data Analysis, Presentation and Interpretation

Reliability analysis

Surucu & Maslakci (2020) note that in quantitative research, nearly all of the forecasting and outcome variables are hypothetical ideas. The use of a valid and reliable device to compute such hypothetical ideas is important in ascertaining the standard of the research. Surucu and Maslakci explain that given the many techniques available to test validity and reliability in research, recommend the addition of construct validity and the employment of Cronbach and CR to conduct the analysis test (Surucu & Maslakci, 2020). Coleman (2022) asserts that qualitative research must show meticulous implementation of suitable instruments to show the validity and reliability of their research (Coleman, 2020).

Table 1: Reliability Test Statistics

Reliability Statistics		
Variable	Cronbach's Alpha	N of Items
Digital Infrastructure	0.720	6
Digital Innovation	0.78	5
Service delivery	0.77	5

The reliability statistics provide Cronbach's Alpha values, indicating the internal consistency of the variables: Digital Infrastructure ($\alpha = 0.720$): This shows acceptable reliability, suggesting moderate consistency across the six items measuring this variable. Digital Innovation ($\alpha = 0.78$): This also demonstrates high reliability, reflecting good internal consistency. Service Delivery ($\alpha = 0.77$): With high reliability, the five items measuring service delivery are consistent. Overall, the variables show good reliability.

Assess the influence of digital infrastructure on public service delivery. The study objective employed both quantitative. The quantitative approach is via a Likert scale rating of 1 -5 where, 5 is for strongly agree, 4 for agree, 3 for moderate, 2 for disagree and 1 for strongly disagree. The response percentages are indicated in the following table;

Table 2: Digital Infrastructure Effect on Public Service Delivery

Statement	Response frequencies ratings				
	1 = strongly disagree	2 = disagree	3 = moderate	4 = agree	5 = strongly agree
Optimal utilization of the digital infrastructure influences service delivery among government ministries in Kenya	-	5.9%	16.7%	29.4%	48%
Digital infrastructure are valuable assets that contribute to service delivery among government ministries in Kenya	1%	1%	7.8%	23.5%	66.7%
Digital infrastructure is key in digitization in government geared towards enhancing service delivery in government ministries in Kenya	1%	1%	5.9%	34.3%	57.8%
The availability and access of digital infrastructure influence service delivery in government ministries in Kenya	0%	2.9%	14.7%	31.4%	51%
The cost and deployment of digital infrastructure facilities affect the provision of service delivery in government ministries in Kenya	3.9%	6.9%	12.7%	40.2%	36.3%
Digital infrastructures necessitate varied processes that affect the provision of service delivery in government ministries in Kenya	2%	6.9%	14.7%	38.2%	38.2%

Table above gives the analysis on impact digital infrastructure on the public service delivery using different indicators to measure the magnitude in reference to this the analysis on optimal utilization of the digital infrastructure influence service delivery among government ministries in Kenya the following findings; 48% of respondents agree compared to 29.4% who strongly agree that the use of digital infrastructure impacts service delivery; 66.7% of respondents strongly agree as compared to 27% who agree that digital infrastructure deployment impacts public service delivery; 59% of the respondents strongly agree as compared to 34.3% who agree that integration of digital technologies impacts public service delivery; 51% of respondents strongly agree as compared to 34% who agree that digital infrastructure accessibility affects public service delivery; 43% of the respondents agree as compared to 35% who strongly agree that digital infrastructure acquisition costs influence public service delivery and; 39% of respondents agree as compared to 36% who strongly agree that digital infrastructures offer varied services that impact public service delivery.

The findings establish the interrelation between digital infrastructure and public service delivery. Some of the key responses include; digital infrastructure and public service delivery co-exist together; digital infrastructures offer platforms for public service delivery; a robust digital infrastructure that includes reliable networks, databases and modern systems is important in improving online services being provided by the government and ministries and; digital infrastructure has made service delivery productive and ease of access many services that were previously offered via physical presence. Digital infrastructures are useful assets and the backbone for public service delivery. They are key enablers for digital transformation and thus require proper planning and effective implementation to realize optimal public service delivery. There is a need to actualize the national information communication infrastructure that will spearhead the national digital transformation this is agreed with a study by Bariu, (2020) who opined that with a well-planned and effective implementation of the information communication technology infrastructure, the service delivery can be greatly enhanced.

Digital Innovation

The study also tried to assess the effect of digital innovation on public service delivery. The objective utilized the quantitative and qualitative investigation approach using a Likert scale. The study sought a quantitative response based on a Likert scale of 1 -5 where, 5 is for strongly agree, 4 for agree, 3 for moderate, 2 for disagree and 1 for strongly disagree. The quantitative response frequencies are indicated in the following table;

Table 3: Digital Innovation Effect on Public Service Delivery

Statement	Response frequencies ratings				
	1 = strongly disagree	2 = disagree	3 = moderate	4 = agree	5 = strongly agree
Diverse digital innovations affect public service delivery	2.0%	2.9%	21.6%	37.3%	36.3%
Digital innovations in services impact public service delivery	2.0%	5.9%	14.7%	35.3%	42.2%
Digital innovation leads to accountability and impacts public service delivery	1.0%	8.8%	15.7%	35.3%	39.2%
Digital innovation adds value to the provision of public services	1.0%	7.8%	21.6%	35.3%	34.3%
Integration of internal and external innovations impacts public service delivery	2.9%	9.8%	18.6%	30.4%	38.2%

The questionnaire's quantitative findings can be summarized with the following findings; 38% of respondents agree as compared to 36% who strongly agree that diverse digital innovations affect public service delivery; 40% of respondents strongly agree as compared to 36% who agree that digital innovations in services impact public service delivery; 40% of respondents agree as compared to 34% who strongly agree that digital innovation leads to accountability and impacts public service delivery; 36% of respondents strongly agree as compared to 33% who agree that digital innovation adds value to the public services being offered and; 38% of respondents strongly agree as compared to 31% who agree that integration of internal and external innovations impacts public service delivery.

The qualitative question sought to find how digital innovation and public service delivery are interlinked and found from responses that; there exists a transformative connection between digital innovation and public service delivery; digital innovation establishes new solutions and strategies that help drive business growth, improve service efficiencies and meet customers ever-changing needs; digital innovation help reduce paperwork and speed up service delivery; digital innovation reshapes the public service delivery by creating new service models, expands access and enable personalization; there is need for government institutions to update their digital innovations to keep up with and integrate with new and emerging technologies in betterment of public service delivery.

Digital innovation in government is a modern trending positive vibe that has led to the adoption of new service models and solutions geared at improving public service delivery. Digital innovation is characterized by the betterment of the quality and efficiency of public services. Digital Innovation leads to the development of more friendly services and is a continuous process that integrates new and emerging technologies for the enhancement of the delivery of public services. Joukhadar et al., (2023) opined that public entities embrace digital innovations in their workings to meet customer needs and service delivery. It also notes that digital innovations shouldn't be focused on financial benefits but on customer satisfaction and as a means to measure success, economic growth, and viability.

Service Delivery

The study's response variable was meant to assess the impact of information communication technology adoption on public service delivery. The study employed both five quantitative questions and one qualitative question. The variable sought to find from the respondents the extent of acceptance of the questionnaire statement on the impact of the adoption of information communication technology on service delivery on public service delivery. The response rate was on a Likert scale of 1 -5 where, 5 is for strongly agree, 4 for agree, 3 for moderate, 2 for disagree and 1 for strongly disagree. The quantitative responses are indicated in the following table.

Table 4: Effect of information communication technology on public service delivery.

Statement	Response frequencies ratings				
	1 = strongly disagree	2 = disagree	3 = moderate	4 = agree	5 = strongly agree
Digitalization of diverse public services has led to integrity in service delivery	2.0%	5.9%	27.5%	37.5%	27.5%
Digitalization of various public services offers many usefulness	1.0%	1.0%	21.6%	41.2%	35.3%
Digitalization of diverse public services has created service efficiency	2.0%	6.9%	16.7%	34.3%	40.2%
Digitalization of public services has created an innovative public service	2.0%	9.8%	19.6%	39.2%	29.45
Digitalization in public services has led to competitiveness in service delivery	2.0%	6.9%	14.75	37.3%	39.2%

The study objective as derived from the questionnaire can be summarized with the following quantitative findings; 36% of respondents agree as compared to 31% who have a moderate view that digitalization of diverse public services has led to integrity in service delivery; 43% of respondents agree as compared to 30% who strongly agree that digitalization of various public services offers much usefulness; 44% of respondents strongly agree as compared

to 31% who agree that digitalization of diverse public services has created service efficiency; 39% of respondents agree as compared to 29% who strongly agree that digitalization of public services has created an innovative public service and; 37% strongly agree as compared to 36% who agree that digitalization in public services has led to competitiveness in service delivery.

The qualitative responses on their view of the general view on embracing information communication technology and public service delivery in government ministries found that; most government ministries had greatly improved from the recent past on service delivery but there is still room for more improvement; the government has and is leveraged on digitization of its services and automation of various processes and services geared at enhancing public service delivery; digital transformation coupled with stakeholder partnerships and service feedback mechanisms are essential for improving public service delivery; despite many challenges concerned with digital transformations, there is always a room for improvement in improving efficacy, straightforwardness and responsiveness by the government to citizens.

Service delivery by the government has greatly improved in recent times but there is a need and room for more improvement. The adoption of digitization and digitalization of government services and processes respectively will realize improved service delivery and ensure efficiency, transparency and responsiveness of public service delivery. Thus, technology is key to be leveraged to spur economic growth and viability.

Table 5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.702a	0.493	0.472	2.54436

Predictors: (Constant), Digital Innovation and Digital Infrastructure

Important information about the association between the variables in the regression study is found in Table 17's summary model: R (0.702): There is a high positive correlation between the independent and dependent variables, as indicated by the correlation coefficient. With a score of 0.702, a strong linear relationship is shown. R Square (0.493): This indicates that the independent variables in the model account for 49.3% of the variation observed in the dependent variable. A moderate to strong explanatory power is indicated. R Square is adjusted for the number of predictors in the model using the adjusted R Square value (0.472). It declines significantly at 47.2%, which still indicates a reasonable match while taking the complexity of the model into account. The estimate's standard error, or 2.54436, indicates the mean interval that the perceived values drop down from the regression line. A lower value indicates a preferable prediction accuracy by the model. In conclusion, the model shows a strong relationship with good explanatory power, but there's room for improving prediction accuracy.

Table 6: Analysis of variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	609.534	4	152.383	23.539	.000b
	Residual	627.956	97	6.474		
Total		1237.49	101			

a Dependent Variable: Service delivery

b Predictors: (Constant), Digital innovation and Digital Infrastructure

Table 6 shows the study ANOVA analysis the importance of the regression model predicting service delivery based on the independent variables—digital innovation, digital skills, digital infrastructure, and digital government services—is revealed by the ANOVA analysis. The variation in service delivery described by these variables is portrayed by the regression sum of squares (609.534), whilst the ambiguous variance is represented by the remaining sum of squares (627.956). All of the variance in service delivery is reflected in the total sum of squares (1237.49). The residuals, or the remaining variance after the predictors are taken into account, have 97 degrees of freedom (df) in this model, compared to 4 df for the predictors. The mean square for regression is 152.383, significantly higher than the residual mean square of 6.474, indicating that the model explains a large portion of the variance in service delivery compared to the unexplained variance. The F-value (23.539) shows a strong ratio of explained to unexplained variance, highlighting that the model is consequential. This is confirmed by the p-value (Sig. = .000), which is well below the typical threshold of 0.05. Therefore, the predictors – digital infrastructure and digital innovation, have a significant combined effect on service delivery, demonstrating that the model is a strong and meaningful predictor of the outcome.

Regression analysis

According to Ksenija et al. (2021), the objective of the various regression models is to examine several predictors (explanatory variables) trying to find out their greatest combination to forecast the value of the benchmark (response variable). Even though referred to as Independent and dependent, these parameters are indeed interconnected and descriptions of their causal relationship ought to be avoided on condition that the survey is significant ($P < 0.005$) which explains variance and other measurements (Ksenija et al., 2021).

This assessment established the foundation under which this study evaluated the study's assumptions, made deductions to the population and gave interpretations based on the study objectives. The purpose of this study was to assess information communication technology adoption on service delivery in the Ministry of Information, Communication and the Digital Economy. This was explained by the model equation below;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \hat{\epsilon}$$

In which

Y= Dependent variable (Service Delivery)

β_1 = Coefficient (Predicted)

X_1 = Independent Variable

X_2 = Digital Infrastructure

X_2 = Digital innovation

Table 1: Regression Coefficient

Coefficients						
Model				Standardised Coefficients	T	Sig.
				Beta		
1	(Constant)	-0.259	2.132		-0.122	0.903
	Digital Infrastructure	0.278	0.089	0.275	3.111	0.002
	Digital innovation	0.132	0.094	0.138	1.403	0.164

a. Dependent Variable: Service delivery

From the model generated by the SPSS in the table above the regression equation model is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \hat{\epsilon}$$

$$Y = -0.259 + 0.132X$$

Table 17 gives the regression model that reveals the influence of digital infrastructure and digital innovation on service delivery. The constant (-0.122) is not statistically significant, indicating it does not meaningfully contribute when the independent variables are zero. Among the variables, digital infrastructure (Beta = 0.278, $p = 0.002$) shows a strong and statistically significant positive effect on service delivery. Digital innovation (Beta = 0.132, $p = 0.164$) is not statistically significant, indicating that its impact on service delivery is weaker or less consistent than the other factors in this model. Overall, the model demonstrates that digital infrastructure, skills, and government services are significant predictors of better service delivery, while digital innovation shows a less prominent role in this particular analysis.

Joukhadar et al. (2023) found there exist some hurdles to digital innovation that include; Differing digital matureness, the absence of digital attitudes, decelerated mobilization, service-based repositories, hurried and haphazard problem-solving, and oversight in positioning investment in digital innovation with the wide-ranging government concerns. This is confirmed by the regression model equation. $Y = -0.259 + 0.278X_1 + 0.132X_2$ In which all the study variables have a positive impact even though not strong enough due to other indicators or parameters which were not investigated in the study

Data analysis and interpretation Summary

The study has found; that digital infrastructure and service delivery are interlinked and that digital infrastructures offer platforms for public service delivery; digital innovation and service delivery are connected and digital innovation establishes new solutions and strategies that help drive business growth, improve service efficiencies and speed public service delivery by creating new service models and; the government has and is leveraged on digitization of its services and automation of various processes and services geared at enhancing public service delivery; digital transformation coupled with stakeholder partnerships and service feedback mechanisms are essential for improving public service delivery.

Summary of Findings, Conclusions, and Recommendations

The descriptive findings of the study indicate that the independent variables; digital infrastructure and digital innovation are intertwined in the process of public service delivery. The two variables are key ingredients and components in public service delivery in government ministries.

Digital Infrastructure and service delivery

In this study, an investigation was done on the impact of digital infrastructure on the service delivery by the Ministry of Information, Communication and the Digital Economy. Regression analysis was done to establish the coefficient which indicated the relationship between the digital infrastructure and the service delivery by the ministry. Digital infrastructure (Beta = 0.275, p = 0.002) shows a strong and statistically significant positive effect on service delivery. This implies that improvements in digital infrastructure led to notable enhancements in service delivery.

Digital Innovation has a weaker impact on service delivery, reflected by a beta of 0.132 and an inadmissible p-value of 0.164. This puts forward a notion that while innovation is beneficial, it may not yet be a major driving force for enhancing service delivery in this context. Promoting a culture of innovation, encouraging public-private partnerships for technological solutions, and fostering research and development could potentially increase the influence of digital innovation in the future.

Recommendations

Digital Infrastructure

Given the importance of digital infrastructure as a foundation and bedrock of public service delivery, the government ministries should put in place robust digital infrastructure characterized by reliable networks, secure databases and new-age systems that will allow ministries to streamline their operation and reduce a lot of paperwork in their operations. The government should implement and operationalize a national information communications technology infrastructure. Digital Infrastructure shows a significant impact on service delivery, indicating that reliable and widespread access to digital tools and connectivity is crucial. To build on this, the Ministry should continue investing in robust and scalable infrastructure, including high-speed internet and secure data centres.

Digital innovation drives service delivery by reshaping the way public services are delivered. Government Ministries should embrace new and emerging technologies in their operations and processes to modernize public service delivery. There is a need to incorporate new solutions given that digital innovation is a continuous process hence the need for government ministries to adopt a continuous update of its processes from time to time. Digital Innovation shows a weaker impact on service delivery, suggesting that while beneficial, it hasn't yet been fully leveraged. The Ministry should cultivate a culture of innovation by encouraging experimentation with modern-day innovations like blockchain, artificial intelligence, and the Internet of Things (IoT) in service delivery. Creating innovation hubs within the Ministry, where staff can pilot new ideas, will stimulate the development of cutting-edge solutions to existing challenges. Partnerships with tech startups and private sector innovators could also facilitate the introduction of breakthrough technologies.

Conclusions

The main purpose or the objective of the study was to establish the impact of Information Communication Technology Adoption on Service Delivery in the Ministry of Information, Communications and the Digital Economy in Kenya. From the analysed and interpreted data which were collected from the respondents and the regression coefficients, it was clear that digital infrastructure and digital innovation greatly impact service delivery in the Ministry of Information, Communications and the Digital Economy. Digitization of Government Services is important in leading to digitalization or automation of various government processes and operations.

Suggestions for further study

The variables of this study were derived from the pillars of the Kenya master plan on information communications and technology for the period 2022 to 2032. It is recommended for further research on the foundational themes of the master plan; cyber security management, new technologies, policies and legislations and research and development. The study of these foundational themes will be important as recognized by the master plan to establish how they have impacted public service delivery.

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