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The Influence of ICT Infrastructure On the Performance of the County Government of Baringo, Kenya

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Abstract:

Purpose of the Study: This study examined the influence of ICT infrastructure on the performance of the County Government of Baringo, Kenya. It sought to establish whether the availability and reliability of ICT infrastructure significantly affect county performance in terms of service delivery, revenue collection, and infrastructure management within the devolved system of governance.

Methodology: The study adopted a descriptive cross-sectional survey design involving 300 ICT users, from whom 90 respondents were selected using proportionate stratified and simple random sampling. Data were collected through structured questionnaires and analyzed using SPSS. Descriptive statistics, Pearson correlation, and simple linear regression were employed to test the study hypothesis.

Findings: The findings revealed that ICT infrastructure had a statistically significant positive influence on the performance of the County Government of Baringo. Correlation analysis showed a moderate positive relationship between ICT infrastructure and county performance ($r = .368$, $p = .003$). Regression results indicated that ICT infrastructure significantly predicted county performance ($\beta = 0.312$, $p = .001$), explaining 13.5% of the variation in performance outcomes. Respondents rated ICT infrastructure and county performance at moderate levels, identifying network reliability, power backup, and timely maintenance as key areas requiring improvement. Enhanced ICT infrastructure was associated with improved service delivery, revenue collection, and infrastructure management.

Conclusion: The study concludes that ICT infrastructure is a significant determinant of county government performance. Investments in reliable hardware, stable network connectivity, data management systems, and regular maintenance can enhance service delivery and operational efficiency. County governments should prioritize ICT infrastructure development alongside complementary organizational and financial support initiatives.

Keywords: *ICT infrastructure, county government performance, service delivery, Baringo County.*

1.0 INTRODUCTION

In Kenya, the devolution of government functions to 47 county governments under the Constitution of Kenya 2010 created new administrative entities that require substantial ICT investment to operate effectively. County governments are mandated to deliver local health services, early childhood education, agriculture extension, county roads, and local revenue collection, all of which increasingly depend on digital systems for efficiency and accountability (Commission on Revenue Allocation, 2022). However, county governments vary significantly in their ICT infrastructure endowments, with rural and semi-arid counties such as Baringo facing particular challenges in hardware availability, network coverage, and ICT technical capacity.

1.1 Background of the Study

The role of Information and Communication Technology (ICT) in transforming public sector governance has attracted sustained scholarly and policy attention in both developed and developing countries. ICT infrastructure encompassing hardware, network systems, data storage, and supporting physical facilities constitutes the technological backbone that enables government institutions to process information, communicate across departments, and deliver services efficiently to citizens. Heeks (2020) notes that robust ICT infrastructure is a prerequisite for e-government effectiveness, as it determines the speed, reliability, and reach of digital government services. In devolved governance systems particularly, where administrative functions are distributed across multiple institutions, the availability and quality of ICT infrastructure significantly shape institutional performance.

In Estonia, ICT infrastructure investment has transformed public administration into one of the most digitally advanced governance systems in the world. The Estonian government's e-government framework, supported by extensive broadband infrastructure and interoperable data systems, enables citizens to access over 99% of public services online. Lember, Kattel, and Tõnurist (2021) document that Estonia's digital public services have reduced administrative processing times by an average of 60% and have significantly lowered the cost of public service delivery per citizen. The country's investment in secure data exchange infrastructure, known as the X-Road platform, underpins seamless data sharing across government institutions, demonstrating how physical and digital ICT infrastructure together drive institutional performance.

In South Korea, the government's National Information and Communication Technology Plan has guided sustained investment in ICT infrastructure across all levels of government, including local government administrations. Chung et al. (2022) found that local governments with higher ICT infrastructure scores demonstrated significantly better service delivery performance, with

a positive association between network reliability and citizen satisfaction with government services. The South Korean experience further illustrates that infrastructure quality, including stable internet connectivity and modern data centres, is a stronger determinant of e-government performance than software solutions alone, as infrastructure provides the physical foundation on which all digital services depend.

In Ghana, the government's digitalisation agenda has faced significant challenges rooted in inadequate ICT infrastructure, particularly in regional and district-level government offices. Mensah (2022) found that district assemblies in Ghana with access to reliable internet connectivity and updated hardware demonstrated measurably higher administrative performance, including faster processing of business permits, more accurate revenue records, and improved inter-departmental communication. The study highlighted that unreliable power supply and poor network infrastructure in rural districts created structural barriers to ICT utilisation that reduced the return on investments in government software systems, reinforcing the foundational role of physical ICT infrastructure.

In South Africa, local government performance has been increasingly linked to digital infrastructure quality across municipalities. Manda and Backhouse (2021) examined ICT infrastructure in South African municipalities and found that municipalities with well-maintained server infrastructure, consistent broadband connectivity, and functioning power backup systems delivered services more efficiently and with fewer processing errors than those with infrastructure gaps. The study noted that rural municipalities, which tend to have weaker ICT infrastructure, consistently underperformed against urban municipalities on composite service delivery indices, suggesting that infrastructure inequality at the local government level perpetuates disparities in public service access for citizens.

In Kenya, the importance of ICT infrastructure in supporting public sector performance has been recognised within the Vision 2030 development agenda and the National ICT Policy (2020). The government has made notable progress in ICT-enabled service delivery, including the e-Citizen platform, Huduma Centres, and the digitisation of land and civil registration records. The e-Citizen platform, which had over 14 million registered users by 2022, demonstrates how shared digital infrastructure can accelerate service delivery and reduce transaction costs for citizens (eCitizen, 2022). Kenya had approximately 23.9 million broadband subscriptions as of the first quarter of 2023, with continued expansion of fibre optic networks improving connectivity across urban and peri-urban areas (Communications Authority of Kenya, 2023).

Despite national progress, county governments in Kenya face considerable ICT infrastructure disparities. Kenya ICT Authority (2023) reported that many county government offices outside Nairobi and major urban centres lack reliable internet connectivity, sufficient computing

hardware, and adequate power backup systems. These gaps limit the ability of county governments to deploy digital tools for revenue collection, service delivery tracking, and citizen engagement. Baringo County, located in the Rift Valley region and characterised by semi-arid terrain and a largely rural population, exemplifies the challenges faced by counties where ICT infrastructure investment has not matched the administrative demands created by devolution (Baringo County Government, 2023).

1.1.4 County Government of Baringo

Baringo County is one of Kenya's 47 county governments created under the Constitution of Kenya 2010. Located in the Rift Valley region, the county encompasses diverse landscapes including lakes, hills, and semi-arid zones, with Kabarnet town serving as the county headquarters. The County Government of Baringo operates a devolved governance structure comprising an executive arm headed by the Governor and a legislative arm, the County Assembly, made up of elected Members of the County Assembly (MCAs) who perform legislative, budgetary approval, and oversight functions. County departments are responsible for delivering services across health, agriculture, public works, education, and finance, all of which increasingly rely on digital systems for operational efficiency.

The County Government of Baringo has made incremental investments in ICT systems, including installation of computer equipment in key offices and connection of some departments to the national government's fibre optic network. However, reported challenges include frequent network outages, insufficient hardware for frontline service delivery staff, inadequate power backup infrastructure, and slow resolution of technical faults. These challenges have reportedly undermined the county's revenue collection efficiency and service delivery responsiveness (Baringo County Government, 2023). This study was designed to empirically examine how the existing ICT infrastructure influences the county's performance, as assessed by county employees who interact with these systems daily.

1.2 Statement of the Problem

County governments in Kenya are constitutionally mandated to deliver essential services to citizens, collect local revenues, manage infrastructure, and implement county development plans. The effective discharge of these functions increasingly depends on the availability, reliability, and quality of ICT infrastructure. However, evidence from Kenya's county performance assessments consistently shows that counties such as Baringo struggle with service delivery delays, revenue shortfalls, and administrative inefficiencies that are at least partially attributable to ICT infrastructure gaps (Kenya ICT Authority, 2023; Baringo County Government, 2023).

Despite the growing policy emphasis on digital government at both national and county levels, there is limited empirical research specifically examining how ICT infrastructure influences the performance of the County Government of Baringo. Existing studies on ICT and public sector performance in Kenya tend to focus on national government institutions or urban county governments, leaving a contextual gap regarding rural and semi-arid counties facing distinct infrastructure challenges. Okello and Njeru (2021) examined ICT adoption in Kenyan public institutions broadly but did not isolate ICT infrastructure as a distinct variable or examine Baringo County specifically. Similarly, Muriithi and Omondi (2023) documented positive ICT effects on organisational performance in Kenyan institutions but focused on service organisations rather than devolved county governments. This study addresses the identified gap by empirically examining the specific influence of ICT infrastructure on the performance of the County Government of Baringo, Kenya.

1.3 Purpose of the Study

The purpose of this study was to determine the influence of ICT infrastructure on the performance of the County Government of Baringo, Kenya.

1.4 Research Hypothesis

H0_1: ICT infrastructure does not significantly influence the performance of the County Government of Baringo, Kenya.

2.0 LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Resource-Based View Theory

The Resource-Based View (RBV), developed by Barney (1991) and later extended by Barney and Clark (2007), proposes that an organisation's sustained competitive advantage and superior performance derive from its unique bundle of valuable, rare, inimitable, and non-substitutable resources. When applied to public sector organisations, the RBV explains why government institutions with superior physical and technological resources, including ICT infrastructure, are better positioned to deliver services efficiently and achieve higher performance outcomes. ICT infrastructure constitutes a critical organisational resource because it directly enables faster information processing, enhanced communication, and improved decision-making across all administrative functions (Barney, 2002).

In the context of the County Government of Baringo, the RBV predicts that counties investing in reliable hardware, stable network connectivity, and robust data management systems will outperform counties with inadequate ICT resources. The theory supports the study's central proposition that ICT infrastructure is a significant determinant of county performance, as the availability and quality of these technological resources directly shape the capacity of county departments to process service requests, collect revenues, and manage public assets effectively. Obeidat, Al-Hadidi, Tarhini, and Masa'deh (2021) confirmed that ICT resource quality is a significant predictor of public sector performance in developing country contexts, reinforcing the theoretical relevance of the RBV to this study.

2.1.2 Systems Theory

Systems Theory, developed by von Bertalanffy (1968) and later applied extensively to organisational and information systems contexts, conceptualises organisations as complex, interconnected systems in which changes in one component produce effects across all other components. In the context of ICT and public sector performance, Systems Theory explains how ICT infrastructure functions not as an isolated input but as an integrated component of the broader organisational system, whose quality directly influences the functioning of all other administrative processes. Laudon and Laudon (2020) apply Systems Theory to information systems by demonstrating that ICT infrastructure provides the foundational layer on which all higher-level organisational functions depend, meaning that weaknesses in infrastructure produce cascading effects on service delivery, revenue management, and administrative efficiency.

Systems Theory is particularly relevant to the County Government of Baringo because it explains the interconnected nature of ICT infrastructure and county performance. When network connectivity is unreliable, all department-level digital operations are disrupted, from revenue collection systems to service delivery tracking platforms. When hardware is insufficient, frontline staff cannot process citizen requests digitally, forcing reliance on slower manual systems. Kast and Rosenzweig (1972), whose work on open systems thinking influenced modern organisational theory, emphasised that system performance depends on the harmonious functioning of all components, and that a weak infrastructure layer undermines the performance potential of the entire system, regardless of the quality of other inputs such as trained personnel or software applications.

2.2 Empirical Review

2.2.1 ICT Infrastructure and Institutional Performance

Etabo et al. (2025) conducted a study on ICT infrastructure and e-government adoption in Kenyan county governments, finding a strong positive correlation between ICT infrastructure quality and the effectiveness of digital government services. Counties with reliable server infrastructure, stable internet connectivity, and modern computing equipment demonstrated significantly higher rates of successful e-service transactions compared to counties with ageing hardware and frequent network outages. The study recommended sustained ICT capital expenditure as a prerequisite for achieving the e-government performance targets set under Kenya's Vision 2030 digital agenda.

Manda and Backhouse (2021) examined ICT infrastructure in South African local government municipalities, finding that municipalities with well-maintained ICT systems showed measurably better service delivery outcomes, including faster processing times, higher citizen satisfaction scores, and more accurate financial record-keeping. The study identified power backup systems and network reliability as the two ICT infrastructure components most strongly associated with consistent service delivery performance, noting that municipalities lacking reliable power backup experienced significantly more service disruptions during electricity outages. These findings are relevant to Baringo County's context, where power infrastructure challenges are a reported operational constraint.

Okello and Njeru (2021) investigated the relationship between ICT investment and performance in Kenyan public institutions, finding that organisations that prioritised ICT infrastructure maintenance and upgrading demonstrated higher employee productivity and more efficient service processing compared to those that deferred infrastructure investment. The study used regression analysis and found that ICT infrastructure quality explained a statistically significant proportion of variance in institutional performance scores, supporting the theoretical predictions of both the Resource-Based View and Systems Theory. The authors noted that in resource-constrained public sector contexts, targeted investment in foundational ICT infrastructure yields higher performance returns than equivalent investment in software applications built on unreliable infrastructure.

Kipkemei and Mose (2024) examined ICT systems and performance outcomes in Kenyan state corporations, finding that the adequacy of physical ICT infrastructure, including hardware, network systems, and data management facilities, was significantly associated with operational efficiency and revenue performance. The study employed multiple regression analysis and found that ICT infrastructure had a statistically significant positive effect on institutional performance ($\beta = 0.241$, $p = .002$), consistent with the broader literature. The study highlighted that county and state institutions in rural Kenya face particular challenges in maintaining ICT infrastructure due to limited budgets for hardware replacement and technical maintenance,

which progressively degrades the quality of the infrastructure base and reduces performance outcomes over time.

Mensah (2022) studied ICT infrastructure and district government performance in Ghana, a context structurally similar to Kenyan county governments. Using survey data from district assembly officials, the study found that districts with higher ICT infrastructure scores, defined by hardware adequacy, network reliability, and data storage quality, significantly outperformed districts with lower infrastructure scores on composite service delivery measures. Mensah (2022) further found that rural districts faced greater challenges in maintaining ICT infrastructure due to power supply unreliability and limited access to technical support, leading to higher rates of system downtime and lower digital service utilisation rates. These findings directly inform the current study's focus on Baringo County, where similar structural challenges are reported.

2.2.2 County Performance

County government performance in Kenya is typically assessed across three primary dimensions: service delivery efficiency, revenue collection effectiveness, and infrastructure management capacity (Commission on Revenue Allocation, 2022). Service delivery performance refers to the speed, quality, and accessibility of services provided to citizens across county mandates including health, agriculture, and public works. Revenue collection performance measures the county's ability to collect local revenue through business permits, market fees, and land rates, which directly affects the fiscal autonomy and development capacity of the county. Infrastructure management performance encompasses the county's ability to plan, construct, and maintain public infrastructure including county roads, water facilities, and public buildings.

Anguche et al. (2024) documented that county governments in Kenya with stronger ICT systems, including functional online revenue platforms and integrated departmental information systems, demonstrated significantly higher local revenue collection efficiency compared to counties relying on manual collection systems. Their study found that counties with ICT-supported revenue systems collected on average 27% more local revenue than comparable counties using manual systems, attributable to reduced revenue leakage, faster transaction processing, and improved audit trails that reduce opportunities for revenue misappropriation. These findings underscore the particular importance of ICT infrastructure in supporting the revenue collection dimension of county performance.

2.3 Conceptual Framework

The conceptual framework for this study positions ICT infrastructure as the independent variable and county performance as the dependent variable. ICT infrastructure is operationalised through three dimensions: hardware adequacy and reliability, network connectivity and speed, and data storage and management systems. County performance is operationalised through three dimensions: service delivery efficiency, revenue collection effectiveness, and infrastructure management capacity. The framework proposes a direct positive relationship between ICT infrastructure quality and county performance outcomes, mediated by the efficiency of administrative processes enabled by the available technology.

Independent Variable → Dependent Variable

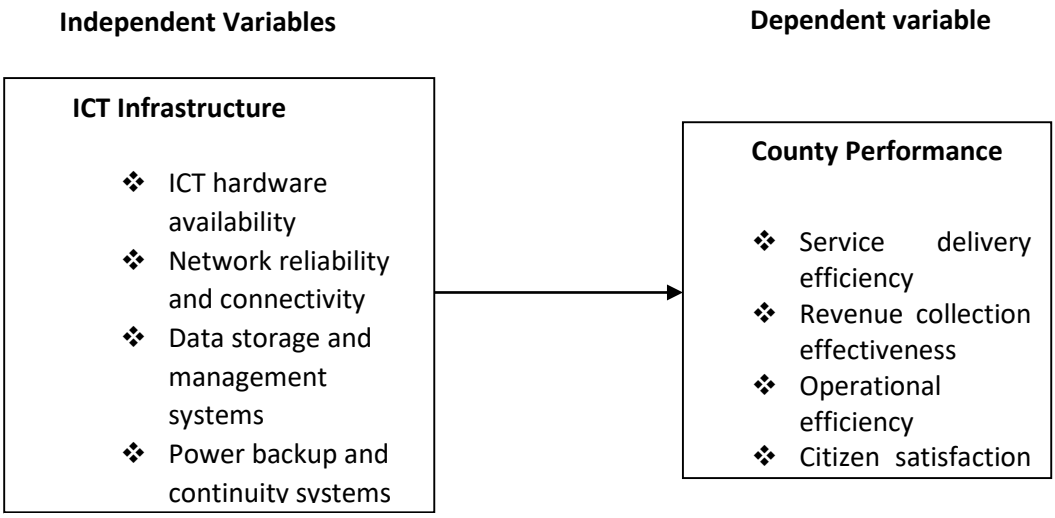

Figure 1: Conceptual Framework

3.0 RESEARCH METHODOLOGY

The study employed a descriptive cross-sectional survey design to examine the influence of ICT infrastructure on the performance of the County Government of Baringo, Kenya. The unit of observation was individual county employees, while the unit of analysis was the County Government of Baringo. The target population comprised 300 county employees who are active ICT users drawn from the Office of the Governor, the County Assembly, County Departments, and the County Public Service Board. Official employee registers from these offices constituted the sampling frame.

A sample of 90 respondents, representing 30% of the target population, was selected using proportionate stratified sampling to ensure adequate representation of all offices, followed by simple random sampling within each stratum. Primary data were collected using a structured

questionnaire containing mainly closed-ended items measuring the adequacy and utilisation of ICT infrastructure and indicators of county performance, including service efficiency, effectiveness, and responsiveness. Secondary data were obtained from county reports, policy documents, and relevant scholarly publications.

After obtaining the necessary approvals and informed consent from participants, the collected data were coded and analysed using SPSS. Descriptive statistics summarised respondents' perceptions of the study variables. Pearson correlation analysis determined the strength and direction of the relationship between ICT infrastructure and county performance. Simple linear regression analysis was used to determine the influence of ICT infrastructure on county performance. Findings are presented using tables and explanatory narratives.

4.0 RESEARCH FINDINGS AND DISCUSSION

4.1 Response Rate

The study targeted 90 respondents from the total target population of 300 county employees who are active ICT users in the County Government of Baringo, as presented in Table 4.1.

Table 4.1: Response Rate

Response	Frequency	Percentage
Questionnaires returned and filled	83	92.2%
Questionnaires not returned	7	7.8%
Total distributed	90	100%

Of the 90 questionnaires distributed, 83 were returned duly completed, representing a response rate of 92.2%. Seven questionnaires (7.8%) were not returned. Mugenda and Mugenda (2012) state that a response rate exceeding 70% is considered adequate for drawing meaningful statistical conclusions. The 92.2% response rate achieved in this study therefore provides a sound basis for the analysis and conclusions presented in subsequent sections.

4.2 Descriptive Statistics

4.2.1 ICT Infrastructure

The first objective of the study was to ascertain the influence of ICT infrastructure on the performance of the County Government of Baringo. Respondents rated nine statements on a five-point Likert scale, with results presented in Table 4.2.

Table 4.2: Descriptive Statistics for ICT Infrastructure

Statement	N	Mean	Std. Dev
There is enough hardware available for staff to do their tasks effectively.	83	3.24	0.987
The computers, servers, and other hardware are reliable enough to support daily work.	83	3.08	1.045
Hardware is well-supported, and maintenance or upgrades are done when needed.	83	3.35	0.923
The internet and network connection are reliable for daily work.	83	3.16	1.012
The network speed is sufficient for all necessary tasks and applications.	83	3.02	1.087
Network problems are resolved quickly to avoid disruption to work.	83	2.87	1.123
The data storage and management systems are reliable and well-maintained.	83	3.31	0.956
The data systems have room for expansion to meet increasing county needs.	83	3.11	1.034
Cooling and power backup measures are sufficient to prevent system failures.	83	3.05	1.098
Average Mean	83	3.13	

The results indicate that respondents held a moderately positive perception of ICT infrastructure in the County Government of Baringo, with an average mean of 3.13. Hardware maintenance and upgrades recorded the highest mean score (M = 3.35, SD = 0.923), indicating that respondents were relatively satisfied with hardware upkeep practices. Data storage and management systems also received a comparatively positive rating (M = 3.31, SD = 0.956). However, the timely resolution of network problems received the lowest mean score (M = 2.87, SD = 1.123), indicating that respondents were dissatisfied with how quickly network faults were addressed. Network speed (M = 3.02, SD = 1.087) and power backup measures (M = 3.05, SD = 1.098) also recorded below-average scores, suggesting that these areas require targeted improvement.

The findings are consistent with Etabo et al. (2025), who found that network reliability and technical support responsiveness were the ICT infrastructure dimensions most frequently cited as performance bottlenecks in Kenyan public institutions. The overall moderate mean of 3.13 confirms that while foundational ICT infrastructure exists in Baringo County, significant gaps remain in network reliability, problem resolution, and physical facility quality, all of which constrain the county's capacity to use digital systems effectively for service delivery and revenue management.

4.2.2 County Performance

The dependent variable, county performance, was measured across three dimensions: service delivery, revenue collection, and infrastructure management. Results are presented in Table 4.3.

Table 4.3: Descriptive Statistics for County Performance

Statement	Mean	Std. Dev
Service Delivery	3.22	0.987
Revenue Collection	2.87	1.089
Infrastructure Management	3.08	1.023
Average Mean	3.06	

County employees rated overall county performance at a moderate mean of 3.06. Service delivery received the highest rating (M = 3.22, SD = 0.987), suggesting that employees perceive service delivery as reasonably functional despite existing challenges. Infrastructure management received a mid-range score (M = 3.08, SD = 1.023). Revenue collection recorded the lowest mean (M = 2.87, SD = 1.089), indicating that employees perceive significant challenges in this area.

The low rating for revenue collection is consistent with reports of revenue shortfalls at the County Government of Baringo, including reported inefficiencies in business permit issuance and local revenue tracking that have been linked to inadequate ICT systems (Baringo County Government, 2023). These findings align with Anguche et al. (2024), who documented that counties with weaker ICT infrastructure consistently underperform in local revenue collection. The moderate overall performance mean of 3.06 confirms that the county is functioning at a basic level but falls short of optimal performance, providing the empirical basis for investigating whether ICT infrastructure improvements can drive performance gains.

4.3 Inferential Statistics

4.3.1 Correlation Analysis

Pearson correlation analysis was conducted to determine the strength and direction of the relationship between ICT infrastructure and county performance. Results are presented in Table 4.4.

Table 4.4: Pearson Correlation Analysis — ICT Infrastructure and County Performance

Variable	Pearson r	Sig. (2-tailed)
ICT Infrastructure → County Performance	.368**	.003

County Performance (dependent variable)	1.000	–

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

The Pearson correlation analysis reveals a statistically significant positive relationship between ICT infrastructure and county performance ($r = .368$, $p = .003$). The p-value of .003 is below the 0.01 significance threshold, indicating that the correlation is unlikely to have occurred by chance. The moderate positive correlation coefficient of .368 suggests that improvements in ICT infrastructure are associated with meaningful improvements in county performance as perceived by county employees.

These findings are consistent with Etabo et al. (2025), who reported a positive correlation between ICT infrastructure and e-government performance in Kenyan county governments. The moderate strength of the correlation suggests that while ICT infrastructure is a significant factor in county performance, other variables not examined in this study also contribute to performance outcomes, including human resource capacity, financial management practices, and county leadership. The positive direction of the correlation confirms the study's theoretical position, grounded in both the Resource-Based View and Systems Theory, that higher-quality ICT infrastructure is associated with stronger institutional performance.

4.3.2 Regression Analysis

Simple linear regression analysis was conducted to determine the influence of ICT infrastructure on the performance of the County Government of Baringo. The results are presented in Tables 4.5, 4.6, and 4.7.

Table 4.5: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.368	.135	.124	.468

The model summary shows an R value of .368, confirming a positive association between ICT infrastructure and county performance. The R Square value of .135 indicates that ICT infrastructure explains 13.5% of the variance in county performance at the County Government of Baringo. The Adjusted R Square of .124 provides a more conservative estimate, accounting for the number of predictors in the model. The remaining 86.5% of variance in county performance is attributable to other factors not included in this model, such as financial resources, human resource capacity, and county governance practices. The explanatory power of 13.5% is modest but statistically meaningful, consistent with the empirical evidence that ICT

infrastructure is one among several drivers of public sector performance (Kipkemei & Mose, 2024).

Table 4.6: Analysis of Variance (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.764	1	2.764	12.601	.001
Residual	17.808	81	.220		
Total	20.572	82			

The ANOVA results confirm that the regression model is statistically significant (F = 12.601, p = .001). The p-value of .001 is well below the conventional 0.05 threshold, indicating that ICT infrastructure significantly predicts county performance, and that the model fit is unlikely to have occurred by chance. This finding confirms the statistical relevance of ICT infrastructure as an explanatory variable for county performance and supports rejection of the null hypothesis that ICT infrastructure does not significantly influence the performance of the County Government of Baringo.

Table 4.7: Regression Coefficients

Model	B (Unstandardized)	Std. Error	Beta (Standardized)	t	Sig.
(Constant)	1.612	0.389		4.144	.000
ICT Infrastructure	0.312	0.088	0.368	3.550	.001

The regression equation derived from the analysis is:

County Performance = 1.612 + 0.312 (ICT Infrastructure)

The constant value of 1.612 represents the estimated baseline level of county performance in the theoretical absence of ICT infrastructure, reflecting residual performance attributable to manual processes and staff effort. The unstandardised regression coefficient for ICT infrastructure (B = 0.312, p = .001) indicates that a one-unit increase in ICT infrastructure quality is associated with a 0.312-unit increase in county performance, holding all other factors constant. The standardised coefficient (Beta = 0.368) confirms that ICT infrastructure has a moderate positive effect on county performance. The t-value of 3.550 and the p-value of .001 confirm that this coefficient is statistically significant at the 1% level, leading to rejection of the null hypothesis.

These findings are consistent with Okello and Njeru (2021), who found that ICT infrastructure quality was a statistically significant predictor of performance in Kenyan public institutions, with regression coefficients in a comparable range. The results also align with Manda and Backhouse (2021), who documented significant positive regression effects of ICT infrastructure on local government performance in South African municipalities. The positive and significant regression coefficient for ICT infrastructure in Baringo County confirms that targeted investment in hardware adequacy, network reliability, and data management systems would yield measurable performance improvements across service delivery, revenue collection, and infrastructure management dimensions.

5.0 Summary of the Study

This study examined the influence of ICT infrastructure on the performance of the County Government of Baringo, Kenya. The study was guided by a descriptive cross-sectional survey design and collected primary data from 83 county employees who are active ICT users, representing a response rate of 92.2%.

Descriptive analysis revealed that respondents held a moderately positive perception of ICT infrastructure at the county government, with an overall mean of 3.13. Hardware maintenance was rated most positively, while network problem resolution, network speed, and power backup were rated below average, signalling critical infrastructure gaps. County performance was rated at a moderate mean of 3.06, with revenue collection recording the lowest performance score (M = 2.87), reflecting ongoing challenges in digital revenue management.

Pearson correlation analysis confirmed a statistically significant positive relationship between ICT infrastructure and county performance ($r = .368$, $p = .003$). Simple linear regression analysis revealed that ICT infrastructure significantly predicts county performance ($\beta = 0.312$, $p = .001$), explaining 13.5% of the variance in performance outcomes. The ANOVA confirmed that the regression model was statistically significant ($F = 12.601$, $p = .001$). The null hypothesis that ICT infrastructure does not significantly influence the performance of the County Government of Baringo was therefore rejected.

6.0 Conclusion

The study concludes that ICT infrastructure exerts a significant positive influence on the performance of the County Government of Baringo, Kenya. Counties that invest in reliable hardware, stable network connectivity, and robust data storage and management systems are better positioned to deliver services efficiently, collect revenues effectively, and manage public infrastructure responsibly. The findings confirm the theoretical predictions of both the Resource-Based View and Systems Theory, which together position ICT infrastructure as a

foundational organisational resource whose quality shapes the functioning of all higher-level administrative processes.

While ICT infrastructure explains 13.5% of the variance in county performance, the remaining 86.5% attributable to other factors suggests that ICT infrastructure investment alone is insufficient to transform county performance. Complementary investments in ICT human capacity, software solutions, and financial resources for ICT are necessary to maximise the returns from infrastructure improvements. Nevertheless, the significant regression coefficient confirms that infrastructure is the prerequisite layer on which all other ICT-enabled performance gains depend, and that addressing infrastructure gaps is the most urgent priority for the County Government of Baringo.

7.0 Recommendations

Based on the research findings, the following recommendations are proposed:

First, the County Government of Baringo should prioritise investment in network infrastructure, specifically the installation of reliable broadband connectivity and redundant network systems in all county offices. The low mean score for network problem resolution (M = 2.87) and network speed (M = 3.02) indicates that network infrastructure constitutes the most critical ICT gap currently constraining county performance. A service-level agreement with internet service providers should be established to ensure prompt fault resolution within defined timeframes.

Second, the county should invest in uninterrupted power supply (UPS) systems and backup generator capacity for all critical ICT infrastructure points. The below-average rating for power backup measures (M = 3.05) suggests that system downtime caused by power outages is a recurring performance constraint. Reliable power backup is the enabling condition for consistent ICT system availability, which underpins all ICT-related performance gains.

Third, the county should establish a structured ICT infrastructure maintenance programme with dedicated budget allocation for scheduled hardware inspection, replacement of ageing equipment, and preventive network maintenance. Deferred maintenance progressively degrades infrastructure quality and increases the risk of system failures that disrupt service delivery and revenue collection. A dedicated ICT maintenance fund should be included in the County Annual Development Plan.

Fourth, given the particularly low performance score for revenue collection (M = 2.87), the county should prioritise deployment of ICT-supported revenue management systems, including digital business permit platforms and integrated revenue tracking systems, on a foundation of reliable ICT infrastructure. Digital revenue systems can only deliver performance

improvements when the underlying network and hardware infrastructure is stable and consistently available.

8.0 Areas for Further Research

Future research should consider examining the influence of other ICT dimensions, including software solutions, ICT human capacity, and financial resources for ICT, on county performance in Baringo and comparable rural counties. Longitudinal studies tracking county performance improvements over time following ICT infrastructure investments would provide stronger causal evidence of the infrastructure-performance relationship. Comparative studies examining ICT infrastructure and performance across multiple Kenyan county governments would enable identification of best practices and benchmarking of county ICT investment levels. Additionally, qualitative studies exploring citizen perceptions of service delivery quality in relation to county ICT systems would complement the employee-perspective data gathered in this study.

9. REFERENCES

Baringo County Government. (2023). Baringo County integrated development plan 2023–2027. County Government of Baringo. https://www.baringo.go.ke/resource/cidp-2023-2027-popular/?tk=NjQwMA==

Barney, J. B. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120. https://doi.org/10.1177/014920639101700108

Barney, J. B. (2002). Gaining and sustaining competitive advantage (2nd ed.). Pearson Prentice Hall. https://www.scirp.org/reference/referencespapers?referenceid=1550084

Commission on Revenue Allocation. (2022). County performance assessment report 2021/2022. Commission on Revenue Allocation Kenya. https://www.crakenya.org

Communications Authority of Kenya. (2023). Quarterly sector statistics report, Q1 2022/23. Communications Authority of Kenya. https://www.ca.go.ke

eCitizen. (2022). eCitizen platform annual report 2022. Government of Kenya. https://www.ecitizen.go.ke

Heeks, R. (2020). ICT4D 3.0? Part 1 — the components of an emerging fourth industrial revolution approach to international development. The Electronic Journal of Information Systems in Developing Countries, 86(3), e12124. https://doi.org/10.1002/isd2.12124

Kast, F. E., & Rosenzweig, J. E. (1972). General systems theory: Applications for organization and management. Academy of Management Journal, 15(4), 447–465. https://doi.org/10.2307/255141

Kenya ICT Authority. (2023). Kenya ICT sector performance report 2022/2023. ICT Authority Kenya. https://www.icta.go.ke

Chung, C., Choi, H., & Cho, Y. (2022). Analysis of Digital Governance transition in South Korea: Focusing on the leadership of the President for Government Innovation.

Journal of Open Innovation Technology Market and Complexity, *8*(1), 2. https://doi.org/10.3390/joitmc8010002

Kipkemei, J., & Mose, T. (2024). ICT systems and performance of state corporations in Kenya. Journal of Business and Management Studies, 6(1), 112–129. https://doi.org/10.32996/jbms.2024.6.1.9

Laudon, K. C., & Laudon, J. P. (2020). Management information systems: Managing the digital firm (16th ed.). Pearson Education. https://www.scirp.org/reference/referencespapers?referenceid=3794844

Lember, V., Kattel, R., & Tõnurist, P. (2021). Technological capacity in the public sector: The case of Estonia. International Review of Administrative Sciences, 87(2), 214–230. https://doi.org/10.1177/0020852317735164

Manda, M. I., & Backhouse, J. (2021). Towards digital transformation and inclusive development in South African local government. The Electronic Journal of Information Systems in Developing Countries, 87(4), e12173. https://doi.org/10.1002/isd2.12173

Mensah, I. K. (2022). Impact of government capacity and E-government performance on the adoption of E-government services. International Journal of Public Administration, 45(3), 227–239. https://doi.org/10.1080/01900692.2019.1628059

Mugenda, A. G., & Mugenda, O. M. (2012). Research methods dictionary. ACTS Press. https://www.scirp.org/reference/referencespapers?referenceid=2998951

Muriithi, P., & Omondi, R. (2023). Effect of information communication technology utilisation on organisational performance of Population Services Kenya. International Journal of Social Science and Humanities Research, 11(2), 45–59. https://doi.org/10.5281/zenodo.7923451

Anguche, C., Kimani, H., & Ndururi, J. (2024). E-Government services and performance of county governments in Kenya: the case of Nairobi City County. *European Journal of Business and Strategic Management*, *9*(3), 1–30. https://doi.org/10.47604/ejbsm.2796

Obeidat, B. Y., Al-Hadidi, A., Tarhini, A., & Masa'deh, R. (2021). Factors affecting strategy implementation: A case study of pharmaceutical companies in the Middle East. Review of International Business and Strategy, 27(3), 386–408. https://doi.org/10.1108/RIBS-10-2016-0065

Okello, D., & Njeru, A. (2021). Influence of ICT adoption on performance of public institutions in Kenya. Journal of Public Administration and Governance, 11(1), 66–82. https://www.researchgate.net/publication/369344160_Influence_of_Technology_Adoption_Interventions_on_Performance_of_Selected_Commercial_State_Corporations_in_Kenya

von Bertalanffy, L. (1968). General system theory: Foundations, development, applications. George Braziller. https://www.scirp.org/reference/referencespapers?referenceid=2040488

Etabo, L. J., Ochieng, O. C., & Lumumba, L. (2025). Influence of ICT infrastructure on the adoption of E-Government on service delivery in Turkana County Government, Kenya. International Journal of Multidisciplinary and Current Research, 13(6), 515–530. https://doi.org/10.14741/ijmcr/v.13.6.3

World Bank. (2022). Digital government and public sector performance. World Bank Group. https://www.worldbank.org/en/topic/digitaldevelopment