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Stella Chami, David Lagat & Benson Kimathi

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[1] Stella Chami, [2] David Lagat & [3] Benson Kimathi

[1] Research Officer, Construction Research and Business Development, National Construction Authority (NCA), Kenya

[2] Assistant Manager, Construction Research and Business Development, National Construction Authority (NCA), Kenya

[3] Data Analyst, Construction Research and Business Development, National Construction Authority (NCA), Kenya

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ABSTRACT

Adopting technology to streamline internal and external services has been identified as a key driver in transforming government operations. As a result, most governments have invested heavily in ICT to better serve their constituents. With the advent of e-government, governments can now easily provide services and opportunities to citizens, businesses, and other governments. However, in Kenya, most public institutions continue with manual operation despite the Government investing heavily in ICT to ensure efficient service delivery. Thus, this survey aimed to investigate the factors influencing the successful implementation of the ICT system to enhance the regulatory performance of the National Construction Authority. The study focused on the effect of ICT facilities, ICT funding, and ICT user training on service delivery. The anchoring theory in this study was the Rodgers Theory of diffusion. Data collection was through the primary method of administering questionnaires to 208 National Construction Authority staff. One hundred fifty-four questionnaires were returned with a 74% response rate. Data analysis was conducted using both descriptive and inferential statistics. Based on the findings, User Training, ICT facilities, and ICT funding were significant predictors of quality-of-service delivery. Based on the coefficient values, user training was found to have the most impact on the quality-of-service delivery.

Keywords: *Regulatory Performance, Information Communication Technology, e-government*

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INTRODUCTION

Around the world, the use of technology to streamline services internally and externally has been identified as a key engine in transforming government operations (Vial, 2019). As such, most governments have spent significant money developing IT infrastructure and deploying ICT to serve their stakeholders better. The launch of e-government provides a means for governments worldwide to provide citizens, businesses, and other governments with easy access to government services and opportunities. The Malaysian public sector, for instance, is evolving rapidly. Kaliannan (2010) states that the vision for Malaysia's e-government is one where the Government, business, and citizenry work together to benefit the country and its people. Some challenges the Malaysian Government found as a barrier to e-government implementation include standardization and consistency, a technological lag, and the digital divide. After this insight, the Malaysian Government launched the Public Sector ICT Strategic Plan in 2003 to ensure that all government agencies' ICT initiatives aligned with the Public Sector ICT vision.

In a developing country, the challenges to ICT implementation remain a bigger challenge (Ofori-Mensal, 2017). For example, in Tanzania, the public sector has adopted ICT as the key aspect of service delivery due to complaints reported by the citizens. These complaints were associated with the need to increase the levels of accountability, promote efficiency and effectiveness, introduce participative decision making and adopt customer-focused practices in ministries, local authorities, and government departments. The Government of Kenya (GoK) has also taken various steps to improve public service delivery. For example, efforts have been made to improve ICT infrastructure across the country by institutionalizing legal and regulatory policies that promote the automation of services, while guaranteeing data safety. Despite these efforts, e-services need to be departmentalized and rely on manual processes with multiple duplications. Some efficient processes need more information-sharing capabilities, resulting in more efficient processes and ineffective delivery of e-government services even where GoK functions have adopted automated support. Clearly, to mainstream Public Service delivery innovations in ICT, a coherent Strategy must guide and harmonize the process and products of innovation (Ministry of Information Communication and Technology, 2017).

The National Construction Authority (NCA) is a state corporation established by the NCA Act No. 41 of 2011. NCA's mission is to regulate, streamline and build capacity in the construction industry for sustainable socio-economic development. As required by the Act, NCA has developed ICT Policies in accordance with the Government of Kenya ICT Standards. The Policy gives explicit guidelines where its compliance would cement efficient, reliable, and effective service delivery and prudent use of available resources in furthering new and innovative products and services. Due to the evolution of technology, the cultural context of construction projects has become significantly complex. More people want instant information and prefer flexible practices in a globalized world. As a result, most businesses and firms use ICT to improve their performance. Regulatory bodies have also adopted this model to better serve their clients by enforcing policies and regulations. Therefore, technology is intended to reduce operational costs associated with coordination and transactions (Rimmimgton, 2015).

Overview of factors of ICT system that influence regulatory performance

While ICT integration remains suboptimal at the National Construction Authority of Kenya with regard to operations and service delivery, increased use of ICT can offer numerous organizational benefits in this era of information explosion and knowledge economy. Suboptimal utilization of ICT remains a challenge across the public institution in all sectors. Insufficient ICT infrastructure, lack of computer literacy and skills, lack of awareness of internet facilities among policymakers, government

officials, and the ruling class in general, and minimal involvement of academic institutions in network building are factors cited by Okiy (2013) and Magutu et al., (2010). Kimani (2017) cites a lack of functional ICT policies, economic barriers, poor ICT infrastructure, resistance to change, low communication capacity, and poor policies for manpower development as common barriers to ICT integration and utilization in Government. Based on this insight, empirical research was necessary to determine factors that influence the ICT system on the regulatory performance of the National Construction Authority.

ICT Funding

ICT is one of the crucial components to the realization of an organization's goal. The current economy requires firms to invest heavily in modern technologies to gain a competitive edge. Shababi & Ziari (2021) views Information Technology as the key ingredient to attaining maximum productivity in the modern world. Regulatory institutions in the Kenyan context need to channel their resources, particularly into funding ICT systems. Ensuring institutions have up-to-date ICT systems guarantees the efficient execution of institutional mandates. Muyoka (2015) highlights the effort directed by the Government toward enhancing ICT infrastructure and notes how the allocation of funds through partner programs between the development partners and the relevant institutions has been initiated to foster advancement in information technology. Sectors such as education have invested heavily in ICT by allocating funds to improve learning (Lipesa, 2018). As various institutions seek advanced ICT systems for the efficient delivery of services, funding remains one of the main hindrances to harnessing the benefits of ICT. Ojohwoh (2016) ranks inadequate funding as the major barrier to the effective implementation of Information Communication Technology in colleges and recommends increased allocation. That notwithstanding, financial constraints in public institutions and a lack of investment in ICT systems and applications are perceived as significant barriers to ICT adoption (Al-Azawei, Parslow & Lundqvist, 2016).

ICT Infrastructure

Ndegwa et al. (2017 define ICT infrastructure as platforms through which ICT services are dispatched. Ominde et al. (2021) regard infrastructure as a composition of software, hardware, networks, websites, and firmware. With the advancement in global economies, quality infrastructure is essential for driving superior performance across all institutions. Adopting up-to-date ICT infrastructure allows firms, institutions, and businesses to be accountable, transparent, and effective in providing timely client services. Oredo et al. (2019) exemplify how the Government of Kenya leverages Information Communication Technology as a driver of economic agenda through anchorage on Government's economic blueprints. Kenyan Vision 2030 anchors information and communication technology as a key priority area to achieving economic growth through its identification as a vital resource across institutions. Evidently, the quality of ICT infrastructure firmly serves as a fulcrum to the developmental agenda. However, ICT integration for service delivery, particularly in Kenya, must be improved by adequate ICT infrastructure. Migot & Paul (2019) provide a case of the Kenya Revenue Authority in which he presents the challenges to implementing the business automation project in the Authority. Although they note tremendous effort in the automation of operations, they reveal scarce ICT infrastructure as one of the challenges to its implementation. ICT infrastructure, therefore, plays a critical role in the modern economy, particularly as an enabler of economic growth.

User Training

Information and communication technology absorption in its institutions requires a workforce well conversant with ICT skills. The dynamism in the ICT sector calls for time-to-time updating of employee skills. According to Garrido et al. (2012), economic sectors place demands on workers' skills regarding information and communication

technologies. The skills are important in industries such as construction and agriculture and crucial in the service industry. For efficient delivery of services, ICT user training is instrumental. Institutions championing competency training on ICT stand a high chance of delivering quality services hence retaining clients in the long run. Lack of focus on the capacity enhancement of ICT can increase the risk of being vulnerable through skill stagnation hence poor service delivery to their clients. This crucial need for continuous user training for ICT support programs is affirmed by Enakrire (2019). In his study, focusing on ICT skills and support programs enhances and strengthens service delivery. Adopting ICT and its implementation in a government institution is crucial for service delivery.

However, the adoption needs to be improved by adequate ICT training among staff. Masinde & Manyasi (2016) established reasons for the need for more benefits by the Government of Kenya despite the adoption of ICT to result from this. Note that the study measured one of the benefits of ICT adoption (customer delivery) as a dependent variable. It was established that a lack of ICT-related training was a barrier to effective service delivery in the County Governments. Digital Competency among government officers is therefore viewed as an essential component of effective service delivery. More training, conversely, is considered a significant barrier to the delivery of e-government services. According to Chohan & Hu (2020), e-government training has a substantial positive impact on trainees' efficacy, and as such, quality services are provided to the consumer of government services by those continuously trained.

ICT and Service Delivery

Information communication and technology play a crucial role in providing services to users. It is through ICT systems that the application and implementation of administrative procedures in institutions are achieved. In realizing efficiency in the public sector, quality ICT facilities are core. Additionally, establishing a coordinated ICT system enables the perfect execution of government services. According to Yator & Ismail (2014), effective service delivery in government institutions depends on improving the ICT system. Much of it is achieved by establishing a harmonized system that ensures citizens' quick access to government services. A quality e-government system's achievement is based on the IT infrastructure's capability. According to Dahiya & Mathew (2016), formulating a service delivery model for government services requires a well-established ICT infrastructure. In order to deliver quality services to citizens, the Kenyan Government initiated the e-government strategy journey in 2004. In 2006, the then Ministry of Information and Communications (MoICT) steered the realization of the National ICT policy. Since then, tremendous effort regarding the formulation of e-government has been realized to improve transparency, public administration, and efficiency. The current e-government system incorporates integrated services as a one-stop shop for various government services. Some integrated services entail police abstract forms, tax returns, driving license applications, e-business, etc. Despite the improvements in the e-government systems, there need to be more inadequacies that hamper the full implementation. Various studies have explored the challenges hindering the implementation of the system. Wamoto (2015), in his study on e-government implementation and factors hindering its implementation, revealed weak ICT infrastructure and poor project management as factors derailing its implementation. Furthermore, Reddick (2010) cites the lack of citizen involvement in the country, low internet penetration and connectivity in rural areas, and satellite transmission as barriers to implementing the e-government system.

Rodger's Theory of Diffusion

Rodgers developed the theory of diffusion in 1962. The theory explains the nature in which an idea or product is spread in a society over time. The outcome of the diffusion process is that, as part of society, individuals are expected to embrace a new

behavior, idea, or product. The embracement means that the present state of affairs dramatically changes, and people adopt new ideas, behaviors, or products. Therefore, it is through the diffusion process that strategies are implemented in various institutions. The theory aligns well with our study as it enables the examination of the determinants of effective implementation of ICT systems at the National Construction Authority. As Rodgers postulates, adoption is a decision that calls for the full adoption of innovation, while rejection is a failure to embrace the technology. Rodger's reasoning was applied in our study as reinforcing ICT infrastructure, funding, and user training is viewed as vital to fully implementing ICT systems at the Authority. Others focusing on ICT themes have adopted Rodgers' theory of diffusion. Assessment of the challenges facing integration and use of ICT in the management of County Governments in Kenya by Imani (2016) adopted the Rodgers theory of diffusion. The theory was vital in determining the strategies for integrating the ICT system in the County Governments of Kenya.

METHODOLOGY

The study's main objective was to analyze the determinants for implementing ICT systems to enhance regulatory performance. Based on the literature review, ICT funding, ICT infrastructure, and User training were found to be essential ICT components necessary for efficient service delivery. Therefore, the study adopted the factors to assess their influence on service delivery at National Construction. The research questions derived from the factors were as follows;

- To what extent does ICT infrastructure influence service delivery?
- To what extent does ICT funding influence service delivery?
- To what extent does ICT user training influence service delivery?

Data collection was done through the primary method of questionnaires administered to National Construction Authority staff. A total of 154 questionnaires were returned from a target of 208 staff. The number amounted to a 74% response rate which was adequate for data analysis. The variables contained in the above mentioned questions were measured on a Linkert scale, after which a data transformation was conducted to convert the variables into continuous variables. Descriptive statistics and inferential statistics were employed to address the research objectives. Under the descriptive statistics, the mean and standard deviations for all the factors were computed. Correlation analysis was conducted to determine the strength of the relationship between variables. Further, regression analysis was conducted to establish the influence of ICT infrastructure, ICT funding, and User training on service delivery.

RESULTS

The findings showed that 71% of the respondents were male, while 29% were female, table 1. The majority (64%) of the respondents were between 25 to 34 years of Age. Respondents between 35 to 44 years of Age were 29%. Respondents with Ages above 44 years were 7%. Only 2% of the respondents were between 18 to 24 years of Age, Table 2.

Table 1: Frequencies for Gender

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	106	68.831	70.667	70.667
Female	44	28.571	29.333	100.000
Missing	4	2.597		
Total	154	100.000		

Table 2: Frequencies for Age

Age	Frequency	Percent	Valid Percent	Cumulative Percent
18-24	3	1.948	2.000	2.000
25-34	96	62.338	64.000	66.000
35-44	44	28.571	29.333	95.333
45-54	7	4.545	4.667	100.000
Missing	4	2.597		
Total	154	100.000		

Data analysis based on descriptive statistics provided the general distribution of scores for service delivery, ICT infrastructure, User training, and ICT funding variables. From the findings, the average score in terms of service delivery was 68.709 (M=68.71, SD=15.76). The score shows that NCA's performance in terms of service delivery was good but still needs improvement. The measure of ICT infrastructure generated an average score of 63.816 (M=63.82, SD=20.20). Similarly, the score suggests an above-average score regarding the quality of ICT infrastructure. ICT funding recorded an average score of 52.645 (SD=52.65, SD=22.36). The score suggested that the performance of NCA in terms of ICT funding was fair. However, the user training of NCA staff in ICT-related issues recorded an average score of 25.974 (M=25.97, SD=7.15). Details are shown in Table 3 below.

Table 3: Descriptive Statistics

	Service Delivery	ICT Infrastructure	Training	ICT Funding
Valid	148	152	151	152
Missing	6	2	3	2
Mean	68.709	63.816	25.974	52.645
Std. Deviation	15.758	20.204	7.145	22.357
Minimum	5.714	0.000	2.000	0.000
Maximum	100.000	100.000	41.000	100.000

Correlation

Correlation analysis was adopted to measure the strength of the relationship between variables. Focus was on the relationship between service delivery with ICT infrastructure, ICT funding, and user training. The results showed a moderate positive correlation between ICT facilities and service delivery, r (145) = .61, p <. 001. A moderate positive correlation existed between ICT funding and service delivery, r (145) = .446, p <. 001. However, user training had a significant relationship with service delivery, and a weak positive correlation existed, r (145) = .293, p < .001, as shown in Table 4 below.

Table 4: Pearson's Correlations

Variable		Service Delivery		ICT Infrastructure		ICT Funding	Training
Service Delivery	Pearson's r	—					
	p-value	—					
ICT Facilities	Pearson's r	0.610	***	—			
	p-value	< .001		—			
ICT Funding	Pearson's r	0.446	***	0.431	***	—	
	p-value	< .001		< .001		—	
Training	Pearson's r	0.293	***	0.284	***	0.046	—
	p-value	< .001		< .001		0.574	—

* p < .05, ** p < .01, *** p < .001

Regression Analysis

The relationship between service delivery and explanatory variables (ICT infrastructure, ICT funding, and user training) was further expounded using regression analysis. The results proved that ICT infrastructure, funding, and user training are significant predictors of quality service delivery, *F* (3,146) =37.88, p<0. 001. The coefficient of determination (R-squared) value showed that 44% of the variability in service delivery was explained by ICT infrastructure, ICT funding, and user training. Although the R-squared may appear low, it does not necessarily suggest an inherently bad value. Several studies that have employed regression analysis have generated an even lower R -squared while determining the influence of independent variables on the dependent variable. For example, Xiao et al. (2019) analyzed the impact of ICT on early adolescents' reading proficiency in five high-performing countries. The regression analysis for the study generated a lower r-squared of 0. 214. Therefore, our r squared of 0.44 does not suggest a weak model as other factors influence service delivery that is not captured in our study. The coefficient values of ICT infrastructure, ICT funding, and user training are also significant. The use of standardized coefficient values was employed to establish the impact of each independent variable on service delivery. ICT user training had the highest coefficient value of 0.151. ICT infrastructure and funding had a standardized coefficient values of 0.459 and 0. 049. The results suggest that ICT user training has a greater effect on service delivery, followed by ICT infrastructure. The variable with the least effect on service delivery was ICT funding. The change in service delivery due to change in the independent variable was examined using unstandardized coefficient values. The results show that an increment in user training amounts to a 0.422 change in service delivery. A unit change in ICT infrastructure results in 0.369 increments in service delivery. Further, a unit change in ICT funding results in to change in service delivery by 0.176, as shown in Table 5. The difference in standardized and unstandardized values in our results is due to variations in the measurement of the independent variables.

Table 5: Model Summary

Model	R	R^2	Adjusted R^2	RMSE
H_o	0.000	0.000	0.000	15.768
H_1	0.665	0.443	0.431	11.894

Table 6: ANOVA

Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	16073.130	3	5357.710	37.876	< .001
	Residual	20228.175	143	141.456		
	Total	36301.304	146			

Note. The intercept model is omitted, as no meaningful information can be shown.

Table 7: Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p
H_o	(Intercept)	68.613	1.301		52.757	< .001
H_1	(Intercept)	24.519	4.817		5.090	< .001
	ICT Funding	0.176	0.049	0.251	3.627	< .001
	ICT Infrastructure	0.369	0.057	0.459	6.454	< .001
	User Training	0.422	0.151	0.181	2.797	0.006

User Training

User training of NCA staff in ICT-related issues recorded an average score of 25.974 (M=25.97, SD=7.15). The variable was found to be a significant predictor of quality service delivery. Additionally, the variable had the highest coefficient value of 0.151, signifying that the variable has a greater effect on quality service delivery. The findings are consistent with Enakrire (2019), in which he acclaims the need for user training for ICT and support programs for efficient service delivery. His findings assert that focusing on ICT skills and support programs enhances and strengthens service delivery.

ICT Infrastructure

The measure of ICT infrastructure generated an average score of 63.816 (M=63.82, SD=20.20), which suggests an adequate score, but not excellent. The variable had a standardized coefficient value of 0.459, ranking it the second most impactful factor regarding quality service delivery. The findings align with Migot & Paul's (2019) findings which rank ICT infrastructure as a core component of implementing ICT systems for effective service delivery. The study further reveals scarce ICT infrastructure as one of the challenges to its implementation.

ICT funding

ICT funding had a standardized coefficient value of 0.049, while the unstandardized coefficient value was 0.176. Therefore, a unit change in ICT funding results in a change in service delivery by 0. 176. This shows that ICT funding is a significant predictor of quality service delivery. The findings are consistent with Ojohwoh (2016), as it ranks inadequate funding as the major barrier to the effective implementation of information communication technology in colleges. His findings view ICT funding as crucial to effectively implementing ICT systems to enhance service delivery.

CONCLUSION

The study's main objective was to analyze the determinants for implementing ICT systems to enhance regulatory performance. Based on the literature review, ICT funding, ICT infrastructure, and User training were found to be essential ICT components necessary for efficient service delivery. Data analysis based on descriptive statistics provided the general distribution of scores for service delivery, ICT infrastructure, User training, and ICT funding variables. From the findings, the average score in terms of service delivery was 68.709. The score showed that NCA's performance in terms of service delivery was good but still not excellent. The measure of ICT infrastructure generated an average score of 63.816. Similarly, the score suggested an above-average score regarding the quality of ICT infrastructure. ICT funding recorded an average score of 52.645. The score suggested that the performance of NCA in terms of ICT funding was fair. However, the user training of NCA staff in ICT-related issues recorded an average score of 25. 974. Correlation results showed a moderate positive correlation between ICT facilities and service delivery. A moderate positive correlation also existed between ICT funding and service delivery. Although user training had a significant relationship with service delivery, a weak positive correlation existed. Regression analysis results showed that 44% of the variability in service delivery was explained by ICT infrastructure, ICT funding, and user training. User Training, ICT facilities, and ICT funding were significant predictors of quality-of-service delivery, with User training having the greatest impact. The model formulated for this study should be adopted in establishing the ICT Systems at the NCA to boost the influence of the system on the regulatory performance of the Authority.

REFERENCES

Al-Azawei, A., Parslow, P., & Lundqvist, K. (2016). Barriers and opportunities of e-learning implementation in Iraq: A case of public universities. *The International Review of Research in Open and Distributed Learning*, 17(5).

Chohan, S., & Hu, G. (2020). Strengthening digital inclusion through e-government: cohesive ICT training programs to intensify digital competency. Information Technology for Development, 1-23. https://doi.org/10.1080/02681102.2020.1841713

Dahiya, D., & Mathew, S. (2016). IT assets, IT infrastructure performance and IT capability: a framework for e-government. Transforming Government: People, Process and Policy, 10(3), 411-433. https://doi.org/10.1108/tg-07-2015-0031

Enakrire, R. (2019). ICT-related training and support Programmes for information professionals. Education and Information Technologies, 24(6), 3269-3287. https://doi.org/10.1007/s10639-019-09931-1

Garrido, M., Sullivan, J., & Gordon, A. (2012). Understanding the Links Between ICT Skills Training and Employability: An Analytical Framework. Information Technologies & International Development, 8(2). Retrieved 24 January 2022, from.

Imani, J. (2016). An E-Government-Integration Framework for County Governments in Kenya. International *Journal of Science and Research (IJSR)*, 5(2), 1723-1725. https://doi.org/10.21275/v5i2.nov153012

Kaliannan, M., Awang, H., & Raman, M. (2010). Public-private partnerships for e-government services: lessons from Malaysia. *Institutions and Economies*, 207-220.

Kimani, J. G. (2017). Challenges facing integration and use of ICT in the management of county governments in Kenya. *Journal of Information and Technology*, *1*(1): 1-11.

Lipesa, H. (2018). Effectiveness of Integrating Information Communication Technology in Enabling E-Leadership in Public Secondary Schools, Busia County, Kenya. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3185070

Magutu, P. O., Lelei, J. K., & Borura, C. M. (2010). Information systems Implementation in state corporation: a critical evaluation of the process and challenges in Kenyan parastatals.

Masinde, M., & Manyasi, N. (2016). Influence of ICT Related Training on Customer Service Delivery in County Governments in Kenya: A Case of Machakos County. *International Journal Of Scientific & Technology Research*, 5(2). Retrieved 24 January 2022, from.

Migot, L., & Paul, D. (2019). Determinants Of Successful Implementation Of Integrated Tax Projects Of Kenya Revenue Authority, Kenya. *Journal of Entrepreneurship and Project Management*, 4(1), 26-51. https://doi.org/10.47941/jepm.284

Muyoka, V. (2015). Financing Information Communication Technology Projects in Secondary Schools E-Learning: A Case of Mombasa County, Kenya. Journal Of Education And Practice, 6(9). Retrieved 20 January 2022, from.

Ndegwa, A., Kiriri, D., & Achoki, D. (2017). Factors Affecting Adoption Of Donor Funded Ict Projects In The Public Sector In Kenya. *Journal of Entrepreneurship and Project Management*, 2(1), 1-19. https://doi.org/10.47941/jepm.46

Oredo, J. O., Njihia, J., & Iraki, X. N. (2019). Adoption of cloud computing by firms in Kenya: The role of institutional Pressures. *The African Journal of Information Systems*, *11*(3), 1.

Ofori-Mensah, M. (2017). Access to basic public services: Challenges Ghana must overcome. Institute of Economic Affairs Monograph, 46.

Ojohwoh, R. (2016). The challenges of effective implementation of information and communication technology (ICT) in Polytechnics and Colleges of Education Libraries in Delta State, Nigeria. Educational Research, 07(04). https://doi.org/10.14303/er.2016.142

Okiy, R. B. (2013). Strengthening information provision in Nigerian university libraries through information communication technologies. *The Electronic Library*, 23(3): 311-318.

Ominde, D., Ochieng, E., & Omwenga, V. (2021). Optimizing ICT infrastructure performance in developing countries: Kenyan viewpoint. *Technological Forecasting and Social Change*, 169, 120844. https://doi.org/10.1016/j.techfore.2021.120844

Reddick, C. (2010). Comparative E-Government. Springer.

Rimmimgton, A., Dickens, G., & Pasqire, C. (2015). Impact of Information and Communication Technology (ICT) on construction projects. *Organization, technology & management in construction: an international journal*, *7*(3), 1367-1382.

Shababi, H., & ziari, H. (2021). Explaining the Impact of Information Technology Capabilities and Organizational Acceleration on Performance of Banking Sector. *Asia-Pacific Journal of Information Technology and Multimedia*, 10(02), 37-50. https://doi.org/10.17576/apjitm-2021-1002-03

The Ministry of Information Communication and technology. (2017). *The National ICT Master Plan*, 35-55.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The journal of strategic information systems*, *28*(2): 118-144.

Wamoto, F. (2015). E-government implementation in Kenya, an evaluation of Factors hindering or promoting e-government successful implementation. International Journal of Computer Applications Technology and Research, 4(12), 906-915. https://doi.org/10.7753/ijcatr0412.1006

Yator, R., & Ismail, N. (2014). Role Of Information Communication Technology On Service Delivery At The Ministry Of Interior And Coordination Of National Government: A Case Of Immigration Service. *International Journal of Social Sciences and Entrepreneurship*, 1(12). Retrieved 24 January 2022, from.

Xiao, Y., Liu, Y., & Hu, J. (2019). Regression Analysis of ICT Impact Factors on Early Adolescents' Reading Proficiency in Five High-Performing Countries. Frontiers In Psychology, 10. https://doi.org/10.3389/fpsyg.2019.01646