Influence of Technological Innovation on the Performance of National Police Service in Kenya

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Abstract: *Deteriorating performance of the police service has been attributed to inability to implement the police reforms which aim to improve their performance. The purpose of this study was to determine the influence of technological innovation on the performance of National Police Service in Kenya. The study utilized Resource Based View Theory. This study used positivism philosophy and adopted explanatory research design. The study targeted 792 NPS officers. Stratified and simple random sampling techniques were employed to select sample size of 266 NPS officers. Primary data was collected using questionnaire among the NPS officers. Cronbach's Alpha coefficient was adopted to ascertain internal consistency. Content validity was achieved through an expert judgment and construct validity established by conducting a factor analysis. The collected data was coded and analyzed through inferential analysis. The study concluded that there was a positive significant influence of technological innovation on performance of NPS. The study recommended the need for the NPS to prioritize the adoption, integration, and continuous upgrading of technology-based systems in their day-to-day operations.*

Key words: Technological, Innovation, Performance, National Police Service

1. Introduction

Technological innovation refers to a new or enhanced product or process characterized by substantially different technological features. The benefits of such innovations often take time to become evident and typically affect the broader population (Paus, 2020). Technology has long played a crucial role in policing, with information and communication technologies (ICT) evolving alongside police practices. ICT is increasingly serving as the primary interface between governments, public agencies, and citizens. The mutual goal of improving effectiveness and efficiency amid rising demands and limited budgets drives

this relationship (Laufs & Waseem, 2020). Moreover, the COVID-19 pandemic significantly increased police reliance on ICT to enhance operational capabilities (Azoulay & Jones, 2020;).

Public approval for crime-fighting technologies tends to fluctuate based on shifts in crime rates and technological developments. Support often surges following high-profile incidents or mass-casualty events when public concern over security intensifies (Thompson et al., 2020), or when automation is seen as a solution to staffing and resource limitations (Leese, 2021).

Globally, in United States, Alda and Dammert (2024) studied the effects of Body-Worn Cameras (BWCs) on police efficiency of local police agencies. They found that although BWCs may improve evidence gathering and procedural transparency, they are not a panacea for efficiency gains. In Netherlands, Ernst et al. (2021) sought to uncover empirical evidence regarding how technological innovation unfolds within the Dutch police service. The research revealed that internal institutional challenges often serve as substantial barriers to innovation adoption, while social factors such as interpersonal networks and collaborative dynamics tend to facilitate and encourage technological advancement. In Indonesia, Tantimin and Alhakim (2024) investigated The Imperative of Regulating Body-Worn Cameras for the Indonesian Police Force, aiming to assess how deploying BWCs affects accountability and public trust in Indonesia. Identified that without robust regulatory frameworks governing activation, data security, and usage rights, BWCs cannot fulfill their potential in enhancing performance or reducing misconduct.

Regionally, in Nigeria, Nwosu and Mathias (2023) examined how the prevailing technology culture influences adoption of e-policing tools and compliance in selected police commands, Southeast Nigeria. They found that strengthening organizational tech culture through mandatory computer literacy and intensive training can improve electronic policing. Onyepuemu et al. (2022) explored the role of information and communication technology in combating crime among Nigeria Police Force, and demonstrated a significant positive correlation between ICT use (e.g., digital databases, communication tools) and crime-fighting effectiveness.

In South Africa, Matsaung (2023) examined the use of intelligence-led policing to combat cybercrimes, focusing on how adopting digital intelligence systems influences cybercrime detection and prevention. The intelligence-led policing shows promise but is undermined by structural and resource constraints. In Tanzania, Noe (2020) studied ICT in Government Services included the police sector and found that low usability and inadequate ICT skills among officers, which negatively affected implementation.

Locally, Maina (2020) conducted a study on the influence of Information and Communication Technology on Police Officers' Performance in Nyandarua County. Findings indicated a strong positive relationship between ICT toolssuch as communication systems, knowledge-sharing platforms, and digital record systemsand improved police performance, particularly in terms of responsiveness and operational coordination. In Nyeri County, Karamuta (2022) investigated the role of modern technology in enhancing police investigations with the aim of exploring the contributions of forensic and digital tools in criminal investigations. Findings indicated that modern forensic tools such as DNA analysis and digital fingerprinting significantly contributed to accuracy in criminal investigations.

Kirui et al., (2024) explored the effect of CCTV Surveillance on Police Monitoring and Investigations in Nairobi, Kenya. The results showed that CCTV surveillance significantly aided in suspect identification (65%), recovery of stolen vehicles (56%), and provision of evidence for prosecutions (73%). However, officers noted poor image quality, limited data storage, and coordination issues as major constraints. The study concluded that while CCTV improves some investigative outcomes, it is not sufficient on its own without adequate infrastructural and managerial support.

Ijogu (2024) examined the impact of CCTV on Police Operations in Nairobi County, focusing on how citywide surveillance systems affected crime deterrence and investigative outcomes. Analysis showed a 16.3% reduction in bank robberies and carjackings in the first two years of CCTV rollout (2019–2021), and officer interviews confirmed CCTV's deterrent and evidentiary value. The study concluded that CCTV systems significantly improve operational performance when integrated with control room capacity and fast dispatch. Collectively, previous studies underscore the transformative promise of ICT in enhancing police operations, accountability, and public service delivery. However, significant gaps remain highlighting the need for a robust, Kenya-specific investigation into how ICT integration can improve communication and service delivery within the National Police Service.

1.1 Objective of the Study

The research objective was;

To establish the influence of technological innovation on the performance of National Police Service in Kenya.

1.2 Research Question

The following was the research question which guided the study.
What is the influence of technological innovation performance of National Police Service in Kenya?

2. Literature Review

In the United States, Alda and Dammert (2024) studied the effects of body-worn cameras on police efficiency of Local Police Agencies, aiming to empirically assess whether BWCs enhance operational efficiency through case resolution and resource utilization. The results revealed mixed results: while some agencies showed small gains in clearance speed, others saw no statistically significant improvements in efficiency. They concluded that although BWCs may improve evidence gathering and procedural transparency, they are not a panacea for efficiency gains.

In a longitudinal case study, Ernst et al. (2021) sought to uncover empirical evidence regarding how technological innovation unfolds within the Dutch police service. The research revealed that internal institutional challenges often serve as substantial barriers to innovation adoption, while social factors such as interpersonal networks and collaborative dynamics tend to facilitate and encourage technological advancement. Similarly, Alosani et al., (2020) explored the relationship between innovation, strategic planning, and organizational performance in the context of Dubai Police. Their findings reinforced the view that both innovation and planning are vital for achieving high performance, though the study acknowledged limitations related to its cross-sectional design and regional specificity.

In Indonesia, Tantimin and Alhakim (2024) investigated The Imperative of Regulating Body-Worn Cameras for the Indonesian Police Force, aiming to assess how deploying BWCs affects accountability and public trust in Indonesia. The authors concluded that without robust regulatory frameworks governing activation, data security, and usage rights, BWCs cannot fulfill their potential in enhancing performance or reducing misconduct.

Regionally, in Nigeria, Nwosu and Mathias (2023) examined how the prevailing technology culture influences adoption of e-policing tools and compliance in selected police commands, Southeast Nigeria. They concluded that strengthening organizational tech culture through mandatory computer literacy and intensive training can improve electronic policing. Onyepuemu et al. (2022) explored The Role of Information and Communication Technology in Combating Crime among Nigeria Police Force, Results demonstrated a significant positive correlation between ICT use (e.g., digital databases, communication tools) and crime-fighting effectiveness.

In South Africa, Matsaung (2023) examined the use of intelligence-led policing to combat cybercrimes, focusing on how adopting digital intelligence systems influences cybercrime detection and prevention. The thematic analysis revealed that while intelligence systems have improved the prioritization and targeting of cybercriminals, key challenges such as lack of specialized tools, under-resourced investigators, slow victim cooperation, and unclear operational guidelines limit effectiveness. The study concluded that intelligence-led policing shows promise but is undermined by structural and resource constraints. In Tanzania, Noe (2020) studied ICT in Government Services included the police sector. The purpose was to explore adoption levels and effectiveness of digital service platforms. Findings showed low usability and inadequate ICT skills among officers, which negatively affected implementation. The study concluded that while ICT systems hold promise, institutional readiness and training gaps limit effectiveness.

Locally, In Nyandarua County, Maina (2020) conducted a study on the influence of Information and Communication Technology on Police Officers' Performance. The results revealed a strong positive relationship between ICT tools such as communication systems, knowledge-sharing platforms, and digital record systems and improved police performance, particularly in terms of responsiveness and operational coordination. The study concluded that ICT significantly boosts policing efficiency, although limited funding, lack of adequate training, and outdated infrastructure were cited as barriers.

In Nyeri County, Karamuta (2022) investigated the role of modern technology in enhancing police investigations with the aim of exploring the contributions of forensic and digital tools in criminal investigations. Findings indicated that modern forensic tools such as DNA analysis and digital fingerprinting significantly contributed to accuracy in criminal investigations. However, 41% of participants reported that legal and procedural constraints limit the effectiveness of technology use. The study concluded that modern technology enhances investigative efficiency when properly applied and legally supported.

Wamuyu (2021) study aimed to understand the extent to which digital platforms such as mobile applications and crime-reporting software influence police-citizen interaction and operational performance in Nairobi City County. The findings indicated that digital reporting tools had increased the speed of information relay between citizens and police, but low adoption due to fear of victimization and poor digital literacy were significant challenges. The study concluded that digital tools can enhance community engagement and police responsiveness if properly implemented. The knowledge gap was the limited scalability of these innovations and lack of integration into formal police reporting and response systems. Conceptually, existing literature rarely

addresses comprehensive communication strategies. Contextually, most studies focus on non-policing institutions or settings outside Kenya. Methodologically, the reliance on cross-sectional or qualitative designs limits generalizability. These gaps highlight the pressing need for a robust, Kenya-specific investigation into how ICT integration can improve communication and service delivery within the National Police Service.

2.1 Theoretical Underpinning

The study was pinned on Resource-Based View (RBV) theory, initially conceptualized by Penrose (1959). The theory emphasizes the need to efficiently and strategically manage organizational assets to formulate strategies that align with available capabilities. Barney (1991) defines these resources to include tangible and intangible elements such as capabilities, processes, knowledge, organizational culture, and information systems (Luján Salazar, 2022). Key resources contributing to competitive advantage and enhanced performance include employee skills, physical assets, organizational reputation, and brand strength (Ahmed & Othman, 2022).

Leveraging such resources enables organizations to create greater value and improve the efficiency and quality of service provision (Mwikya & Khamah, 2020). The theory accounts for competitive heterogeneity differences in firm performance through the concepts of resource heterogeneity and immobility (Stoelhorst, 2021).

Resources that are not easily transferable or substitutable across firms can sustain competitive advantages, while imitable resources tend to provide only short-term gains (Campbell & Park, 2022). Consequently, managers must prioritize the acquisition and protection of resources that are rare, valuable, inimitable, and non-substitutable to preserve their competitive edge (Utami & Alamanos, 2022).

Nonetheless, the RBV has its drawbacks. Its static assumptions limit its relevance in fast-paced environments, and it often excludes smaller organizations due to the time and investment needed to develop strategic resources (Widjaja & Yuga, 2020). In the context of this study, RBV is applied in providing a framework for understanding how the National Police Service (NPS) enhances its performance by identifying, mobilizing, and effectively utilizing its technological innovation resources to deliver high-quality services.

3. Methodology

This study used positivism philosophy and adopted explanatory research design. The study targeted 792 NPS officers. Stratified and simple random sampling techniques were employed to select sample size of 266 NPS officers. Primary data was collected using questionnaire among the NPS officers. Cronbach's Alpha coefficient was adopted to ascertain internal consistency. Content validity was achieved through an expert judgment and construct validity established by conducting a factor analysis. Before initiating data collection, ethical clearance was obtained from the School of Postgraduate Studies at Moi University. A research authorization permit was secured from the National Commission for Science, Technology and Innovation (NACOSTI). This permit was subsequently submitted to the Inspector General of Police for final approval to conduct the study among NPS officers. The data collected was analyzed using inferential analysis.

4. Results and Discussion

4.1 Correlation Analysis

Correlation analysis assessed the relationships between independent and dependent variables. Pearson's Product-Moment Correlation Coefficient (r) was used to quantify the strength and direction of these relationships, as summarized in Table 1.

Table 1 Correlation Analysis on restructuring and organization performance

		Performance	Technological Innovation
Performance	Pearson Correlation	1	
	Sig. (2-tailed)		
Technological innovation	Pearson Correlation	.872**	1
	Sig. (2-tailed)	.000	

**. Correlation is significant at the 0.01 level (2-tailed).
b. Listwise N=248

Correlation analysis indicated a strong positive relationship between technological innovation and performance (r = 0.872, p = 0.001), meaning greater integration of modern

technologies' adoptionhase improved police performance. The results underscore the necessity for a sustained commitment to technological innovation as a cornerstone

of modern policing. This indicates that as the level of technological innovation increases, organizational performance also improves substantially. In the context of policing, this implies that the adoption of modern technologies—such as digital communication systems, data analytics tools, surveillance equipment, and automated record management systems has enhanced the efficiency, accuracy, and responsiveness of police operations.

These findings align with global evidence suggesting that technological innovation fosters improved service delivery, accountability, and decision-making within law enforcement agencies (Nguyen & Le, 2022). By integrating technology into policing functions, officers are better equipped to manage information, respond swiftly to incidents, and implement evidence-based strategies. Moreover, technology reduces human error and streamlines administrative processes, allowing more focus on core operational duties (Adebayo & Oluwaseun, 2021).

The strong correlation also highlights the transformational role of innovation in modernizing public sector performance. It emphasizes that sustained investment in technological infrastructure and continuous training of personnel is critical for maintaining optimal performance levels. In essence, the result underscores that technological innovation is not merely a support tool but a strategic enabler of institutional efficiency, transparency, and citizen satisfaction in the policing sector

5.1 Conclusion

Technological innovation also significantly affects performance positively. Technologies such as mobile phones facilitated coordination and intelligence gathering, social media helped police interact with citizens, GIS aided in tracking criminals, and photography enabled proper crime scene documentation. CCTV surveillance, automated access control, electronic reporting, security alarms, biometrics, and integrated command centers all contributed to improved policing. Technological innovations such as digital case management systems, biometric identification, GPS-enabled patrol systems, real-time crime mapping, and automated incident reporting can greatly enhance the speed, accuracy, and accountability of police services. These tools not only support faster decision-making and resource deployment but also improve public confidence in police.

5.2 Recommendations

1. From a practical standpoint, the findings emphasize the need for the NPS to prioritize the adoption, integration, and continuous upgrading of technology-based systems in their day-to-day operations.
2. From a policy perspective, the findings advocate for the institutionalization of technological innovation within national policing strategies. Policymakers must allocate sufficient funding for ICT infrastructure, cybersecurity, and capacity-building programs that enhance the digital readiness of police officers.
3. Legislation and regulatory frameworks should also be updated to facilitate lawful access to and use of emerging technologies in crime prevention, investigation, and public safety management. Moreover, partnerships with technology providers, research institutions, and civil society can help co-create solutions that are contextually appropriate and ethically sound.
4. For the NPS to remain responsive and effective in a dynamic security environment, continuous investment in digital transformation and innovation-oriented leadership is imperative.

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