Diffusion of E-Procurement Systems: Enhancing Supply Chain Efficiency in Kakamega County Government Ministries, Kenya

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ABSTRACT

E-procurement emerged in the 1980s alongside the development of Electronic Data Interchange. Advances in Electronic Data Interchange technology enabled organizations to establish online vendor catalogs, streamlining procurement processes. Despite its recognized benefits, many government ministries, including those in Kakamega County, still face significant inefficiencies due to persistent manual procurement processes, leading to delays and resource misallocation. This study investigated the diffusion of electronic procurement systems within Kakamega County Government Ministries, focusing on the relationship between electronic procurement adoption, information and communications technology training, procurement innovations, and implementation challenges, specifically addressing the ongoing challenges of manual systems and proposing solutions through technological integration. A qualitative case study design was adopted, grounded in the Resource-Based View theory, to provide practical insights beyond theoretical constructs. Data was collected through interviews, observations, and document analysis, with rigorous validation measures such as pilot testing, member checking, and triangulation ensuring data trustworthiness. A purposive sampling strategy was employed, targeting 10 participants across three ministries under study. Thematic analysis and validation were utilized to extract meaningful conclusions aligned with qualitative research methodologies. The findings revealed that targeted information and communications technology/information technology training enhanced user confidence and optimized procurement workflows, directly addressing the lack of preparedness for electronic procurement systems. The adoption of innovative tools such as mobile applications and blockchain technology improved efficiency and transparency, offering solutions to existing bottlenecks. However, challenges such as limited training access and infrastructure gaps persisted, requiring tailored interventions to overcome resistance to change and ensure successful implementation. These efforts transformed Kakamega County Government's procurement practices into a more efficient and accountable framework. This study held significance beyond its immediate scope, with contributions that informed policy decisions, enriched existing literature by addressing the empirical gap in local ministry electronic procurement adoption, and enhanced operational efficiency within government ministries and the broader field of supply chain management by providing actionable strategies for overcoming implementation hurdles.

Keywords: E-Procurement, ICT Training, Procurement Innovations, Supply Chain Efficiency, Public Sector

INTRODUCTION

This chapter lays the groundwork for examining the adoption of e-procurement systems within Kakamega County Government Ministries, focusing on their role in enhancing supply chain efficiency, transparency, and service delivery. Anchored in the Resource-Based View (RBV) theory, the chapter presents a conceptual framework that explores the interplay between e-procurement system diffusion, Information and Communication Technology (ICT) training, procurement innovations, and implementation challenges. It emphasizes the necessity of technological integration in government operations and highlights the transformative impact of e-procurement systems in optimizing procurement processes across county ministries, particularly in light of existing manual inefficiencies.

The success of any research endeavor is anchored in a solid theoretical foundation that guides its direction and

interpretation. This study's theoretical framework was drawn from diverse theories explored in the comprehensive literature review, with the Resource-Based View (RBV) theory emerging as the primary lens for examining the diffusion of e-procurement systems and their impact on supply chain efficiency. This theory, rooted in strategic management, posits that sustained competitive advantage arises from a firm's unique bundle of resources and capabilities. By applying this theory, the study analyzed how the adoption and utilization of e-procurement systems as valuable technological resources enhanced supply chain efficiency within Kakamega County Government Ministries.

The study's conceptual framework provided a structured approach to understanding the intricate relationship between e-procurement systems and supply chain efficiency in Kakamega County Government Ministries. A conceptual framework serves as a foundational model outlining key concepts, variables, relationships, and theoretical foundations that guide research design, data collection, and result interpretation. Grounded in the RBV theory, which underscores the strategic significance of valuable resources and capabilities, this study examined the application of ICT innovations in procurement activities. The findings affirmed that organizations with unique technological resources, such as e-procurement systems, gain a competitive advantage. Within this context, the adoption and diffusion of e-procurement systems were found to be critical in optimizing procurement workflows and augmenting supply chain efficiency.

Furthermore, the study acknowledged the multifaceted nature of supply chain management and the role of e-procurement systems in influencing procurement processes, collaboration, and information flow. Through this lens, the conceptual framework unraveled the complex relationships between e-procurement system diffusion, ICT training, procurement innovations, and implementation challenges. The analysis contributed to a broader understanding of the factors affecting e-procurement adoption and its impact on government procurement efficiency.

Background To Study

"Technology will never replace great procurement professionals, but technology in the hands of great procurement professionals is transformational." – Jason Busch.

Globally, the integration of e-procurement systems has proven to be highly beneficial. For instance, in Singapore, the adoption of a centralized e-procurement platform significantly transformed procurement processes within government agencies by streamlining vendor management, reducing processing times, and enhancing transparency. Similarly, Sweden's public sector implementation of e-procurement resulted in substantial cost savings, improved supplier relations, and greater compliance with procurement regulations. These international successes highlight the potential for similar benefits within Kakamega County.

At the local level, this study underscored the urgent need for technological integration within Kakamega County Government Ministries. The research findings confirmed that manual procurement processes persisted, leading to inefficiencies, delays, and resource misallocation. For instance, in the Ministry of Agriculture, Livestock, Cooperatives, and Fisheries, the absence of an integrated e-procurement system resulted in prolonged procurement cycles, hindering timely access to essential agricultural inputs. Similarly, in the Ministry of Social Services, Youth, and Sport, reliance on paper-based procurement processes led to administrative bottlenecks, potentially delaying the timely provision of social services. These findings mirrored the challenges faced by organizations lacking e-procurement systems, reinforcing the need for their integration to enhance supply chain efficiency within Kakamega County Government Ministries.

The study's conclusions highlighted the transformative potential of e-procurement systems in public procurement. By addressing key implementation challenges and leveraging ICT innovations, Kakamega County Government can significantly enhance procurement transparency, efficiency, and accountability, aligning with best practices observed internationally.

Statement of the Problem

Government operations have undergone a transformative shift with the rapid integration of technology. Within Kakamega County Government Ministries, the adoption of e-procurement systems marked a significant

milestone, aimed at enhancing supply chain efficiency. However, as these systems were implemented, a complex interplay of challenges and opportunities emerged. This research was essential in assessing the impact of e-procurement system diffusion on supply chain efficiency within Kakamega County Government Ministries. It sought to address a critical question: How did the adoption of e-procurement systems influence the improvement of supply chain efficiency within this administrative context?

The motivation for this study arose from the acknowledgment that traditional procurement practices within government ministries remained predominantly manual, resulting in persistent inefficiencies that obstructed transparent resource allocation and timely service delivery. Manual procurement processes often lead to delays, increased administrative burdens, and reduced operational efficiency. For example, in the Ministry of Agriculture, Livestock, Cooperatives, and Fisheries, the lack of an integrated e-procurement system has consistently led to extended procurement cycles, delaying access to essential agricultural inputs for farmers. Similarly, the continued reliance on paper-based processes in the Ministry of Social Services, Youth, and Sport has created administrative bottlenecks, hampering the timely delivery of crucial social services to the community. These ongoing issues demonstrate that current procurement practices are not working efficiently on the ground.

The emergence of Information and Communication Technology (ICT) innovations has demonstrated substantial potential to revolutionize procurement processes, enhancing efficiency, transparency, and accountability in public sector procurement. However, harnessing this potential necessitates bridging a significant empirical gap, particularly within Kakamega County Government Ministries. Despite growing discourse on the adoption of e-procurement systems and their transformative impact globally, research remains notably limited regarding their specific integration within local ministries in Kakamega County and their direct effects on supply chain efficiency. There is a lack of clear understanding of how these systems are truly implemented, what specific innovations are being used, and the precise challenges encountered in this localized context. This study will fill this gap by providing an in-depth, localized analysis.

This research problem underscored the urgent need for a systematic investigation into the various dimensions of e-procurement system adoption and diffusion. The study examined existing ICT training levels, the specific innovative ICT applications currently utilized within ministries, and the concrete challenges encountered during their implementation. Ultimately, this research bridged the gap between the theoretical potential of e-procurement systems and their practical implications in improving supply chain efficiency within Kakamega County Government Ministries by providing actionable insights and solutions to the identified problems.

Objectives of the Study

1. To assess the current level of ICT/IT training among the workforce in Kakamega County Government Ministries, specifically identifying gaps in skills and preparedness for e-procurement system utilization.
2. To identify and expose the specific ICT innovation applications currently being used, or that could be effectively used, in Kakamega County Government Ministries for procurement-related activities, highlighting their impact on efficiency and transparency.
3. To investigate the main challenges encountered during the implementation and adoption of e-procurement systems within the specified government ministries, including issues of user resistance, infrastructure limitations, and policy frameworks that hinder successful integration.

Research Questions

This study seeks to address the following research questions:

1. What is the current level of ICT/IT training among the workforce in Kakamega County Government Ministries, and what are the identifiable gaps impacting e-procurement system adoption?
2. What are the specific ICT innovations and technologies currently being applied, or potentially applicable, within Kakamega County Government Ministries for procurement-related activities, and how do they contribute to efficiency and transparency?
3. What are the main challenges encountered during the implementation and adoption of e-procurement systems within the specified government ministries, and what are their underlying causes?

Scope of the Study

This study examined the impact of e-procurement system diffusion on supply chain efficiency within Kakamega County Government Ministries, focusing on three key ministries: Social Services, Youth, and Sport; Agriculture, Livestock, Cooperatives, and Fisheries; and Education, Science, and Technology. These ministries were selected due to their diverse operational functions and critical roles in public service delivery. The research considered the distinct procurement processes, challenges, and opportunities each ministry faced in integrating e-procurement systems.

Beyond the geographical scope, the study explored the broader aspect of technological integration by assessing the extent of Information and Communication Technology (ICT) training within the Kakamega County Government. This evaluation provided insight into the workforce's preparedness in adopting e-procurement systems. Additionally, the study examined the various ICT innovations employed across the county's ministries, offering a comprehensive understanding of the technological tools driving administrative transformation.

The research also addressed the complexities of e-procurement implementation, acknowledging the challenges encountered in integrating these systems into established workflows. By identifying these barriers, the study provided an in-depth analysis of factors that may have hindered seamless integration. Furthermore, it investigated the collaborative aspects of supply chain management, analyzing how the diffusion of e-procurement systems influenced stakeholder interactions in procurement processes.

Overall, this study provided a holistic assessment of e-procurement's impact on supply chain efficiency within Kakamega County Government Ministries. It encompassed ICT training, technological applications, and the multifaceted challenges of implementation, contributing valuable insights to the evolving discourse on supply chain management and technological integration in public governance.

Justification of the Study

This study addressed critical operational challenges within Kakamega County Government Ministries' supply chain processes, which are essential for delivering public services efficiently. Persistent inefficiencies in procurement and distribution had hindered timely service delivery, ultimately affecting overall service quality. By examining the impact of e-procurement systems, the study sought to leverage modern technology's transformative potential to enhance public sector operations. Focusing on key ministries, it assessed the relationship between technology adoption and supply chain improvement, providing practical recommendations for effective governance and service optimization.

The research adopted a qualitative approach, incorporating semi-structured interviews, observations, and document analysis. Qualitative research allows for an in-depth exploration of real-world issues by capturing subjective experiences, perspectives, and interpretations of those directly involved. A purposive sample of 10 participants, including procurement officers, prequalified suppliers, IT specialists, Chief Officers, and a Minister, was selected to ensure a comprehensive understanding of the phenomenon. This approach facilitated the capture of detailed insights that quantitative methods might have overlooked.

The study's scope encompassed evaluating ICT/IT training levels, identifying innovative ICT applications, and analyzing challenges in the implementation and adoption of e-procurement systems. Rooted in the specific context of Kakamega County, the research provided valuable insights for both theoretical advancement and practical application, demonstrating e-procurement's transformative potential in optimizing supply chain processes within government ministries.

Conceptual Framework

The conceptual framework of this study encapsulated the interplay of variables that influenced the diffusion of e-procurement systems and their impact on supply chain efficiency within Kakamega County Government Ministries. A conceptual framework serves as a theoretical model that provides a foundation for understanding, analyzing, and interpreting complex phenomena. It outlines the key concepts, variables, relationships, and

assumptions underlying a research study.

In this study, the independent variables included factors such as ICT training, procurement innovations, and implementation challenges, while the dependent variable was supply chain efficiency. The framework illustrated how the adoption and diffusion of e-procurement systems influenced procurement workflows, service delivery, and overall operational efficiency. By examining these interconnections, the study provided insights into the role of technology in transforming procurement processes within Kakamega County Government Ministries.

The conceptual framework of this study examined the diffusion of e-procurement systems and their impact on supply chain efficiency within Kakamega County Government Ministries. It analyzed three independent variables: ICT/IT training, ICT innovation application, and implementation challenges, alongside their effect on supply chain efficiency as the dependent variable. ICT/IT training was assessed through capacity building initiatives, the recruitment of ICT-skilled personnel, and the overall readiness for e-procurement adoption, directly addressing the gap in workforce preparedness. ICT innovation application included the utilization of modern software systems, robust technological infrastructure, and the strategic deployment of various technologies, aiming to expose and leverage effective tools. Implementation challenges, such as resistance to change, the complexities of integrating with supplier relationships, infrastructure gaps, and existing policy and regulatory frameworks, highlighted the real-world barriers to successful adoption. Supply chain efficiency was measured by streamlined processes, reduced manual intervention, and enhanced accuracy in procurement operations. By evaluating these relationships, the study provided insights into optimizing procurement processes and overcoming e-procurement adoption challenges, thereby offering practical solutions to the identified problem

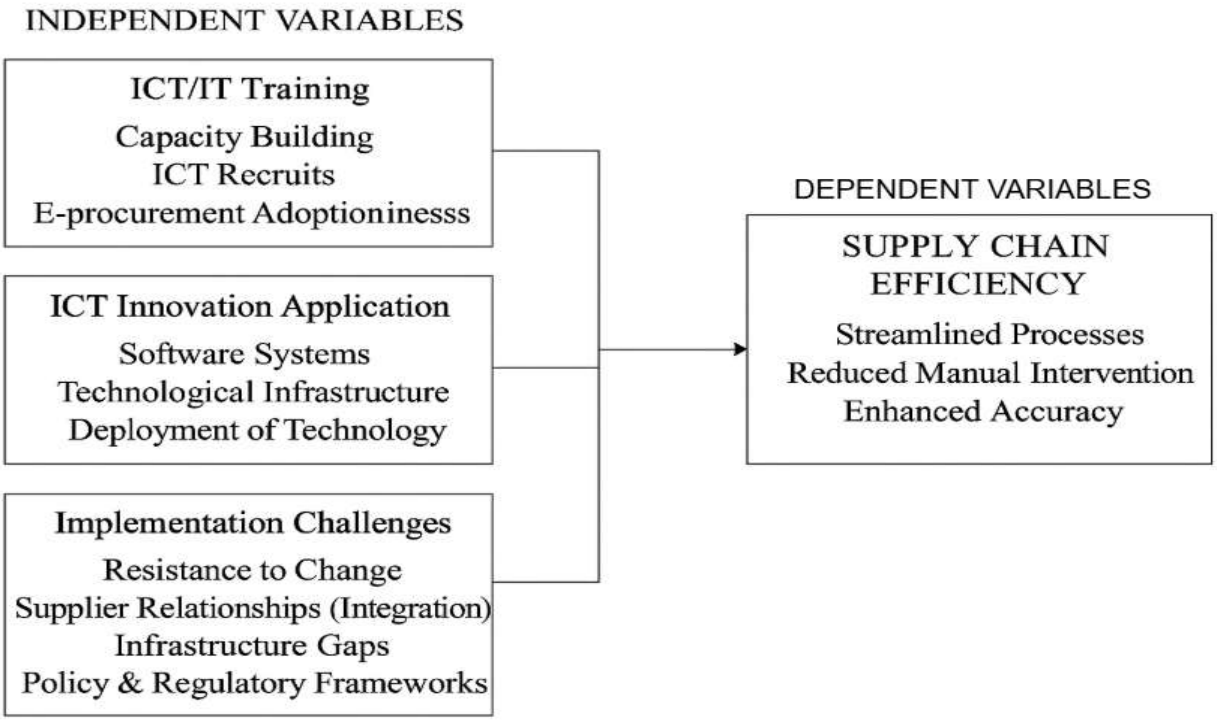

Figure 1: Conceptual framework

LITERATURE REVIEW

This literature delves into the core of the study's exploration, shedding light on the intricate dimensions that substantiate the research objectives. Anchored in the Resource-Based View (RBV) theory, which emphasizes the strategic value of internal capabilities such as ICT competencies and innovation capacity, the chapter also draws upon the Diffusion of Innovations (DOI) theory to contextualize how new technologies are adopted within public institutions. Specifically, the chapter traverses the realms of ICT/IT training assessment, ICT innovations

exposure, and the challenges surrounding the implementation of e-procurement systems in Kakamega County Government Ministries. By integrating both theoretical lenses, the study not only evaluates the internal resources and capacity building efforts but also explores the social and organizational processes — including knowledge dissemination, attitude formation, and decision-making — that influence the uptake and successful institutionalization of technological innovations. This dual-theory approach facilitates a deeper understanding of the interplay between technology, innovation readiness, and the systemic barriers to digital transformation in the public sector.

Resource-Based View (RBV)

The findings of this study align with the Resource-Based View (RBV) theory, which provided a theoretical foundation for understanding the relationship between e-procurement system diffusion and supply chain efficiency enhancement within Kakamega County Government Ministries. Grant (2021) asserts that sustained competitive advantage stems from a firm's unique resources and capabilities, a perspective that resonates with this study's findings. The research confirmed that e-procurement systems, when effectively integrated, serve as valuable technological resources that enhance procurement processes and improve public service delivery. The study further established that ministries with better adoption of e-procurement technologies demonstrated higher efficiency levels, reinforcing RBV's assertion that resource utilization fosters strategic advantages.

Building on this, Vitorino Filho and Moori (2020) highlight that RBV theory illuminates the role of technological resources in driving efficiency improvements, a concept that was evident in the study. The research revealed that ministries leveraging ICT innovations—such as automated procurement platforms and data-driven decision-making tools—witnessed enhanced operational efficiency and greater transparency in procurement cycles. This finding affirms the RBV perspective, which emphasizes that organizations with superior resource deployment achieve a distinct competitive position. Moreover, the study established that effective ICT training played a crucial role in optimizing the use of e-procurement systems, echoing RBV's emphasis on capabilities as key drivers of efficiency.

Additionally, the study confirmed RBV's strategic focus on capabilities, particularly in relation to ICT training and procurement innovations, as outlined by Yang & Morgan (2011). The research demonstrated that ministries investing in ICT capacity-building programs developed a more skilled workforce, leading to seamless e-procurement adoption. This aligns with Mengich et al. (2017), who emphasized the critical role of ICT training in enhancing e-government implementation. Their study on county governments in Kenya highlighted how tailored ICT training programs improved digital literacy, fostering more effective adoption of technological systems. These findings further validate the RBV assertion that an organization's ability to cultivate and utilize its unique resources—such as technological expertise and digital infrastructure—determines its competitive advantage.

Ultimately, this study reaffirmed the RBV theory as a crucial framework for understanding e-procurement system diffusion and its impact on supply chain efficiency. The alignment of RBV principles with the study's findings underscores the transformative potential of e-procurement as a strategic resource, optimizing procurement processes within Kakamega County Government Ministries. By applying this theoretical lens, the research has contributed to the scholarly discourse on public sector digital transformation, offering practical insights for policymakers and supply chain professionals seeking to enhance efficiency, transparency, and accountability through e-procurement adoption.

Assessing ICT/IT Training in Kakamega County Government

The assessment of ICT/IT training within Kakamega County Government highlights its pivotal role in facilitating the adoption and utilization of e-procurement systems. As governments worldwide embrace digital transformation, the technological competence of their workforce emerges as a crucial determinant of success. A well-trained workforce ensures efficient resource allocation, reduced procurement delays, and enhanced transparency. Without adequate training, procurement officers may struggle with system integration, leading to inefficiencies in public service delivery (Harrigan et al., 2008). This study underscores the need for comprehensive ICT/IT training programs that empower government personnel to navigate e-procurement

systems effectively.

The study affirms that the depth of ICT/IT training directly influences e-procurement system efficiency. Mola et al. (2010) argue that a proficient workforce not only operates but also optimizes technological resources for better functionality. The research reveals that procurement managers with advanced ICT knowledge tailor e-procurement systems to county-specific needs, streamlining procurement processes and enhancing efficiency. Without this expertise, officials may underutilize the system's capabilities, missing opportunities for automation and data-driven decision-making.

Furthermore, ICT/IT training fosters innovation within government institutions by equipping employees with technological problem-solving skills. For instance, a purchasing agent trained in data analytics can leverage technology to forecast demand trends and negotiate better procurement terms, resulting in cost savings and resource optimization (Mabhodha & Choga, 2021). However, disparities in skill distribution remain a challenge. Njagi (2018) notes that ICT training is often concentrated in specific departments, creating a digital divide among employees. Ensuring equitable access to training across all administrative levels enhances collective efficiency, enabling all personnel to contribute to digital transformation.

The study further highlights the need for continuous assessment and improvement of training methodologies. Abdullahi & Mohamud (2023) emphasize the role of real-time data access in decision-making, reinforcing the importance of systematic training evaluation. To ensure sustained impact, Kakamega County Government must implement monitoring frameworks measuring system utilization, processing efficiency, and user satisfaction. Regular assessments will help identify training gaps and adjust programs to align with emerging procurement technologies.

Beyond initial training, a culture of lifelong learning is essential for technology adoption sustainability. Encouraging ongoing certifications, workshops, and incentives for innovation keeps the workforce updated with emerging digital trends. Recognizing employees for creative solutions fosters motivation and engagement, ensuring that e-procurement systems evolve alongside technological advancements. This proactive approach positions Kakamega County Government as a leader in digital governance, reinforcing public trust, service efficiency, and investment attractiveness affirmed by Mabhodha & Choga, (2021).

The assessment of ICT/IT training within Kakamega County Government reveals its transformative impact on e-procurement adoption and supply chain efficiency. Training programs enhance system navigation, optimize processes, and bridge digital disparities while fostering a culture of innovation. Real-world examples illustrate that technologically proficient employees can drive process improvements and governance transparency. As digital advancements continue, ongoing training and strategic investment in ICT skills will be crucial in unlocking the full potential of e-procurement systems, ensuring sustainable and efficient public administration.

Exposing ICT Innovations in Kakamega County Government Ministries

The exploration of Information and Communication Technology (ICT) innovations within Kakamega County Government Ministries ventures into a realm of dynamic transformations that hold the promise of revolutionizing procurement-related activities. This section examines the multifaceted landscape of ICT innovations, analyzing their applications, implications, and real-world manifestations within the context of government ministries.

Neirotti and Pesce (2019) observe that ICT innovations, ranging from digital platforms to data analytics tools, serve as technological catalysts that enhance efficiency across various governmental functions. For instance, a procurement officer managing inventory for the Ministry of Agriculture benefits from the adoption of a robust Inventory Management System powered by RFID technology. This system enables real-time tracking of resources, minimizes wastage, and streamlines reordering processes. Such innovations bridge gaps in information flow, ensuring optimal resource utilization and timely replenishment (June et al., 2010). By analyzing these ICT innovations, this study underscores their role in improving efficiency within government ministries.

The transition from intuition-based decision-making to data-driven insights is another significant outcome of

ICT innovations. The Ministry of Education, for instance, leverages Big Data analytics to analyze student enrollment trends, facilitating evidence-based resource allocation. This data-driven approach mitigates resource misallocation and empowers administrators to optimize budget allocations and prioritize educational initiatives where they are most needed. The analysis of ICT innovations in this context highlights their capacity to equip ministries with the necessary tools to navigate complex challenges through informed decision-making.

Innovations such as e-government platforms and online portals redefine the relationship between government and citizens. Within the Ministry of Social Services, for example, an online portal allows citizens to apply for social welfare programs seamlessly. This exemplifies how ICT innovations foster citizen engagement by simplifying bureaucratic processes, enhancing access to services, and promoting transparency. Adam and Fazekas (2021) assert that these technological advancements transcend bureaucratic barriers, enhancing citizen-government interactions.

The integration of e-procurement systems within the Ministry of Youth and Sport illustrates how ICT innovations elevate traditional procurement processes. These systems automate workflows, from tendering to contract management, reducing manual errors and ensuring compliance. By analyzing such innovations, this study highlights how technology transforms procurement from a conventional paperwork-heavy process to an agile and accurate system that optimizes resource utilization and minimizes corruption risks.

Despite their potential, ICT innovations also encounter significant challenges. Understanding these challenges, such as inadequate infrastructure and resistance to change, is crucial for a comprehensive analysis. For instance, the introduction of e-procurement systems may face resistance from employees accustomed to traditional methods. Ntorukiri et al. (2022) emphasize the importance of addressing such resistance to fully harness the benefits of ICT innovations. This study examines these challenges in detail, shedding light on potential hurdles ministries must navigate to achieve successful ICT integration.

ICT innovations also strengthen the county government's resilience, particularly in times of crisis. During natural disasters, a robust Geographic Information System (GIS) integrated within emergency services enhances disaster response and resource allocation. By examining these applications, this study highlights the role of ICT innovations in disaster preparedness. This proactive approach not only improves disaster management but also ensures that Kakamega County Government can respond swiftly and effectively to unforeseen challenges, safeguarding both lives and resources.

Etim (2021) underscores the importance of inclusivity in technology adoption, arguing that while digital tools empower many, they also risk exacerbating existing disparities. For instance, if the Ministry of Cooperatives implements a mobile app for cooperative members' interaction, it must ensure accessibility for all users, regardless of their technological proficiency. By addressing this aspect, the study acknowledges the need to bridge the digital divide and promote equitable access to ICT innovations.

The synergy between ministries facilitated by ICT innovations is another transformative aspect. If the Ministry of Education implements a centralized digital learning platform, collaboration with the Ministry of Science and Technology can enhance its features using innovative technologies. Exploring these collaborative possibilities reveals a networked approach to governance. By fostering inter-ministerial synergy, Kakamega County Government can amplify the impact of ICT innovations, creating an ecosystem where ministries work cohesively, sharing knowledge and resources. This collaborative approach not only optimizes the use of technologies but also fosters a culture of innovation and continuous improvement within the government.

Matteucci et al. (2022) argue that analyzing ICT innovations also involves evaluating their alignment with strategic goals and their potential to shape the future of government operations. Ministries must strategically select innovations that align with their objectives and priorities. For instance, if the Ministry of Science and Technology adopts a cloud-based document management system, it must assess how this innovation fits within its broader digital transformation strategy. Analyzing the strategic alignment of these innovations provides insights into their role in shaping the future trajectory of ministries.

While ICT innovations offer transformative potential, their implementation faces hurdle such as limited financial

resources and cybersecurity concerns. Ministries may also encounter resistance from employees unfamiliar with digital tools. By exploring these barriers in detail, this study acknowledges their existence and proposes strategic solutions. Identifying and addressing these challenges enables Kakamega County Government to facilitate a smoother adoption process, ensuring that ICT innovations are seamlessly integrated into governmental operations.

The exposure of ICT innovations within Kakamega County Government Ministries uncovers a spectrum of transformative possibilities that extend beyond mere technological implementations. By examining the applications, implications, and challenges of these innovations, this study highlights their role in enhancing efficiency, fostering citizen engagement, optimizing procurement, and driving strategic transformation. Real-world examples illustrate how these innovations move beyond theoretical concepts to create tangible improvements across ministries. As this study navigates the complexities of ICT innovations, it provides a comprehensive understanding of how these technologies redefine government operations, paving the way for streamlined processes, data-driven decision-making, and an empowered citizenry.

Investigating Challenges in E-Procurement System Implementation

The investigation into the challenges encountered during the implementation of e-procurement systems within Kakamega County Government Ministries provides a comprehensive analysis of technological integration. This section examines these challenges by exploring their origins, implications, and practical occurrences within government ministries.

One of the primary challenges in e-procurement system implementation involves managing change and addressing cultural resistance. Traditional procurement methods are characterized by manual paperwork and established routines. The introduction of e-procurement systems necessitates a significant transformation, requiring employees to adapt to new workflows and digital interfaces. Abu Bakar et al. (2016) highlight that such transitions often encounter resistance due to employees' familiarity with traditional approaches. For instance, the Ministry of Education's shift from manual bid submissions to an online e-tendering platform demands procurement officers to adjust to a digitized bid submission process. Addressing this challenge necessitates strategic change management approaches that accommodate cultural sensitivities and facilitate employee adaptation to the new technological landscape.

The study further identifies the critical role of technological infrastructure and integration in e-procurement system implementation. Rizki (2019) notes that while e-procurement systems offer numerous benefits, their seamless incorporation within existing technological frameworks poses significant challenges. For example, if the Ministry of Agriculture introduces an e-procurement system to manage farm equipment procurement, it must ensure compatibility with its Enterprise Resource Planning (ERP) system. This highlights the need for technological interoperability, data synchronization, and the development of an integrated digital ecosystem.

Capacity building and training emerge as essential factors in ensuring the successful implementation of e-procurement systems. Adjei-Bamfo et al. (2019) emphasize that the effectiveness of these systems relies on the competency of the workforce in utilizing them efficiently. In the Ministry of Social Services, for instance, the adoption of e-procurement for managing social welfare program supplies requires comprehensive employee training to prevent errors and inefficiencies. Kissi et al. (2016) advocate for tailored training initiatives that empower employees with the necessary skills to leverage e-procurement systems effectively.

Another significant challenge pertains to data security and privacy concerns. As e-procurement systems involve the digital exchange of sensitive procurement information, Thio-ac (2019) underscores the need for robust cybersecurity frameworks. Within the Ministry of Cooperatives, where e-procurement systems handle cooperative member transactions, ensuring data protection is vital in maintaining trust among stakeholders. This underscores the importance of stringent cybersecurity protocols, encryption mechanisms, and adherence to data protection regulations.

Resistance to change and user acceptance also present notable obstacles in e-procurement implementation. Mohungoo et al. (2020) discuss how employees who are accustomed to conventional procurement practices may

be hesitant to embrace new technological solutions. In the Ministry of Youth and Sport, for example, procurement officers accustomed to manual purchase order generation may resist the transition to automated e-procurement due to job security concerns or unfamiliarity with digital tools. Addressing this challenge requires clear communication, structured training programs, and incentives to encourage employees to perceive e-procurement systems as enablers of efficiency rather than threats to job stability.

Additionally, the success of e-procurement systems is contingent upon vendor engagement and collaboration. Singh and Chan (2022) argue that effective implementation extends beyond internal adaptation and necessitates the participation of external stakeholders. In the case of the Ministry of Agriculture, suppliers unfamiliar with digital procurement processes may experience delays and miscommunications, hindering procurement efficiency. This underscores the importance of proactive supplier engagement, transparent communication, and collaborative efforts between ministries and vendors to facilitate seamless interactions.

The findings from this study reveal that overcoming resistance and cultivating an environment conducive to technological transformation is pivotal to the successful integration of e-procurement systems. The Ministry of Education's adoption of e-procurement for textbook procurement, for instance, requires addressing resistance through comprehensive training, open communication, and demonstrable benefits of the system. This highlights the role of change champions within ministries who advocate for digital transformation and inspire others to embrace technological advancements.

The investigation into the challenges of e-procurement implementation underscores the complexity of the transition process. From change management to data security, these challenges illustrate that e-procurement adoption is a continuous journey rather than a one-time event. Real-world cases demonstrate how ministries navigate resistance, infrastructure limitations, and the necessity for capacity building. By delving into these challenges, this study provides practical insights that extend beyond theoretical perspectives, guiding governments in fostering a conducive environment for e-procurement adoption while enhancing efficiency and transparency.

The literature review illuminates the theoretical landscape that supports the study's objectives, as it grounds itself in the Resource-Based View (RBV) theory. This theoretical anchor sets the stage for the multifaceted analysis that follows. The exploration of ICT/IT training's significance within Kakamega County Government Ministries underscores its role as a pivotal resource for technology assimilation. Real-world examples showcase how well-trained employees are crucial in optimizing e-procurement systems, enabling resourceful decision-making, and fostering innovation. Moving further, the chapter exposes the spectrum of ICT innovations within government ministries. These innovations, ranging from data analytics tools to online portals, revolutionize operations and foster citizen engagement. Practical instances demonstrate how technology-driven systems enhance procurement processes, resource allocation, and decision-making. The chapter then delves deep into the challenges encountered during e-procurement system implementation, revealing the necessity for change management, technological compatibility, capacity building, data security, and stakeholder engagement. Real-world scenarios exemplify how ministries navigate resistance, infrastructure limitations, and the need for comprehensive training. As the chapter concludes, it leaves a trail of insights into the complexities and potentials of ICT-driven transformations, paving the way for a holistic understanding of the intricate dynamics at play.

METHODOLOGY

The methodology elucidates the methodological approach devised to accomplish the research objectives. It provides an exhaustive exposition of the research design, target population, sampling techniques, data collection methods, and data analysis strategies that intricately guide the inquiry into the diffusion of e-procurement systems and their consequential impact on supply chain efficiency within the ministries of the Kakamega County Government. Each method's selection and application are underpinned by the imperative need to ensure the study's findings' validity, trustworthiness, and comprehensiveness.

Research Design

This study employed a qualitative case study design to comprehensively investigate the effects of e-procurement

systems on supply chain efficiency within Kakamega County Government Ministries. A qualitative case study design is a research methodology used to explore and understand complex phenomena in real-world contexts. It involves an in-depth examination of a specific case or cases (such as an organization, event, program, or individual) to gain comprehensive insights into the underlying processes, behaviors, and experiences. This research design resonates with the Resource-Based View (RBV) theory and Diffusion of Innovation (DOI) theory, and is harmoniously aligned with the study's overarching objectives. The case study approach offers a profound exploration of the multifaceted impacts of e-procurement systems within the specific context of three pivotal ministries: Social Services, Youth, and Sport; Agriculture, Livestock, Cooperatives, and Fisheries; and Education, Science, and Technology. This design was chosen for its ability to provide rich, in-depth data that can explain complex 'how' and 'why' questions about the adoption and implementation of e-procurement in a specific organizational setting, rather than just identifying correlations or frequencies.

Study Area

The study unfolds within the administrative boundaries of Kakamega County, Kenya—a dynamic region characterized by a blend of urban and rural settings, encompassing a spectrum of socio-economic, cultural, and governance dynamics. Specifically, the study centers its focus on selected ministries within the Kakamega County Government, namely the Ministries of Social Services, Youth, and Sport; Agriculture, Livestock, Cooperatives, and Fisheries; and Education, Science, and Technology. These ministries intricately contribute to the county's socio-economic development, rendering them pertinent units of analysis for scrutinizing the diffusion of e-procurement systems and their influence on supply chain efficiency. Focusing on these specific ministries allows for a granular understanding of the unique challenges and opportunities faced within different operational contexts of the county government.

Theoretical Underpinnings

The study is primarily anchored in the Resource-Based View (RBV) theory and complemented by insights from the Diffusion of Innovation (DOI) theory.

A. Resource-Based View (RBV) Theory

The Resource-Based View (RBV) theory, primarily championed by Jay Barney (1991) and Wernerfelt (1984), posits that a firm's sustainable competitive advantage stems from its unique internal resources and capabilities that are valuable, rare, inimitable, and non-substitutable (VRIN). In the context of this study, e-procurement systems are considered a critical technological resource that, when effectively adopted and utilized, can provide Kakamega County Government Ministries with a competitive advantage in terms of enhanced supply chain efficiency, transparency, and accountability. The RBV is relevant because it allows us to analyze how these ministries leverage e-procurement as a strategic resource to improve their internal processes and service delivery. For instance, the successful implementation of e-procurement can be seen as developing an inimitable capability that streamlines workflows, reduces costs, and improves stakeholder relations, thereby contributing to the county government's overall effectiveness in public service provision. The theory helps explain how and why certain ministries might achieve greater efficiency gains through e-procurement than others, depending on how they develop and integrate this valuable resource.

B. Diffusion of Innovation (DOI) Theory

Complementing RBV, the Diffusion of Innovation (DOI) theory, developed by Everett Rogers (1962), provides a framework for understanding how new ideas, practices, or technologies spread through a social system. This theory is particularly relevant as it helps explain the process of e-procurement system adoption and diffusion within the various ministries. DOI identifies key attributes of an innovation (relative advantage, compatibility, complexity, trialability, observability) and characteristics of adopters (innovators, early adopters, early majority, late majority, laggards) that influence its rate of adoption. By applying DOI, the study explores factors such as the perceived benefits of e-procurement (relative advantage), its fit with existing procurement practices (compatibility), ease of use (complexity), opportunities for piloting (trialability), and visibility of results (observability) in shaping its spread within Kakamega County Government. This theoretical lens is crucial for

understanding the challenges of implementation, such as resistance to change, and for identifying strategies to accelerate the adoption process by understanding the dynamics of how this new technology is perceived and embraced by different stakeholders. This study does not attempt theory triangulation but rather uses DOI as a complementary lens to explain the process of diffusion, while RBV focuses on the value derived from the diffused innovation.

Participants

Participants in this study were purposefully selected based on their direct involvement and experience with e-procurement systems within the Kakamega County Government. The selection was driven by the nature of the research, which sought to explore experiences, perceptions, and challenges related to the implementation of e-procurement in enhancing supply chain efficiency.

Unlike quantitative studies that prioritize large sample sizes for statistical significance, this qualitative study emphasized depth over breadth. The study comprised 10 participants, strategically drawn from three key ministries:

1. Ministry of Social Services, Youth, and Sport.
2. Ministry of Agriculture, Livestock, Cooperatives, and Fisheries.
3. Ministry of Education, Science, and Technology.

The participants were drawn from various roles that interact with procurement processes, ensuring a holistic representation of the e-procurement landscape. These roles included:

1. 3 Procurement Officers,
2. 2 Pre-qualified Suppliers,
3. 2 IT Specialists,
4. 2 Chief Officers, and
5. 1 Minister.

This composition was designed to ensure broad-based insights from both the implementers and external stakeholders of the procurement process. The participants represented varying levels of responsibility and expertise within the procurement domain, thus facilitating a comprehensive understanding of how e-procurement systems influence supply chain operations. Their inclusion aligned with the study's qualitative nature, which prioritized nuanced, experience-based data over numerical generalization.

The selection of these participants enabled the research to capture detailed and context-rich information, consistent with the study's objectives to assess system effectiveness, identify operational bottlenecks, and evaluate user perceptions within the evolving e-procurement environment.

Sampling Method

To ensure an all-encompassing analysis of the study's objectives, a purposive sampling strategy was employed. This strategy affords the selection of participants endowed with pertinent knowledge and experience, impeccably aligning with their specific roles within the ministries. This selection approach guaranteed that the participants were substantially involved in the utilization of e-procurement systems and were aptly positioned to provide profound insights into their effectiveness.

Engaging a total of 10 participants, spanning 3 procurement officers, 2 prequalified suppliers, 2 IT specialists, 2 Chief Officers, and 1 Minister, representing diverse responsibility levels across the three ministries, underscored

the research's granularity and manageability. This stratagem permitted an in-depth exploration while forestalling an excessively protracted data collection process that could compromise the depth of analysis. The deliberate inclusion of numerous roles within each ministry assured a well-rounded perspective on the diffusion of e-procurement systems and their implications for supply chain efficiency. This sample size was determined to be adequate for achieving data saturation, where no new themes or insights emerged from subsequent interviews, which was observed after the sixth interview in this study.

Here's a graphical representation of your participant distribution and research approach. It visually communicates:

1. The diversity of roles involved.
2. The total number of participants.
3. That data saturation was achieved early.
4. That the scope remained both in-depth and manageable.

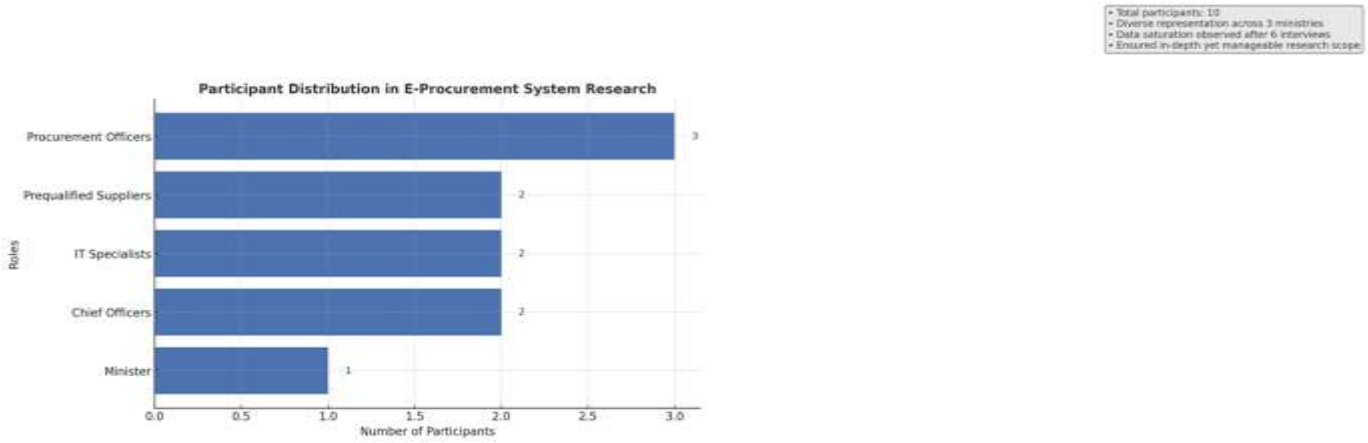

Figure 2: Participant Distribution in E-Procurement System Research

Data Collection

1) Sources of Data

The primary data sources for this study comprised qualitative information gleaned through semi-structured interviews and document analysis. Semi-structured interviews are a qualitative research method that combines elements of both structured and unstructured interviews. In a semi-structured interview, the researcher has a set of predetermined questions or topics, but there is flexibility in how the questions are asked and the direction of the conversation. This allowed for a more in-depth exploration of the participant's perspectives, experiences, and insights. Semi-structured interviews furnished a platform for profound discussions with the 10 participants. These interviews, conducted within the Ministries of Social Services, Youth, and Sport; Agriculture, Livestock, Cooperatives, and Fisheries; and Education, Science, and Technology in Kakamega County Government, enabled a comprehensive exploration of their perceptions, experiences, and insights concerning e-procurement adoption and supply chain efficiency. Additionally, pertinent documents such as procurement policies, reports, and communication records were scrutinized to corroborate and contextualize the insights garnered from the interviews.

2) Data Collection Procedure

Given the qualitative nature of the study, the principal data sources were the individuals holding key roles within the three ministries of focus. A purposive sampling strategy was employed to select participants endowed with rich and relevant experiences in the utilization of e-procurement systems. This approach ascertains that the insights garnered were both meaningful and representative of the phenomenon under study.

The data collection process encompassed a multifaceted approach to capture a holistic understanding of the research objectives. Semi-structured interviews constituted a substantial component, providing a platform for participants to expound upon their experiences, perspectives, and insights concerning e-procurement systems and their impact on supply chain efficiency. All interviews were digitally recorded with consent and later transcribed verbatim. The transcripts of these interviews form a critical part of the raw data (see Appendix D).

Moreover, observations were conducted to provide contextual insights into the practical implementation of e-procurement processes within the ministries. These observations facilitated an in-depth comprehension of the day-to-day operational dynamics and potential bottlenecks. An observation checklist was developed and utilized to systematically record key aspects of e-procurement usage, user interactions, technical infrastructure, and workflow patterns. Data from the observation checklist (see Appendix E) included notes on system uptime, user proficiency, common errors, and physical infrastructure limitations. The results from the observation checklist provided empirical evidence to corroborate or contradict interview data, enhancing the credibility of the findings (e.g., observing slow internet speeds confirming participant complaints about connectivity issues).

Furthermore, document analysis complemented the primary data collection methods. By scrupulously scrutinizing pertinent documents such as procurement reports, process documentation, and training materials, a comprehensive overview of the diffusion of e-procurement systems and their implications for supply chain efficiency was synthesized. The integration of multiple data sources augmented the richness and depth of the study's findings, providing a comprehensive perspective on the research problem. It is important to note that while initial conceptualization might have considered questionnaires, based on the qualitative design and the need for in-depth understanding, no questionnaires were actually deployed as a data collection method. The focus remained strictly on interviews and observations to capture the nuances of human experience and organizational processes.

Validity and Trustworthiness

To fortify the validity and trustworthiness of the study, several measures were put into effect. Validity and trustworthiness are crucial aspects of research methodology, especially in qualitative research. They were key factors in ensuring that the findings and conclusions of a study are accurate, reliable, and credible. Piloting of the interview questions and data collection methods was executed with two non-study participants to ensure precision, clarity, and relevance, leading to minor refinements in question phrasing. Member checking, involving the validation of themes and interpretations with selected participants after initial analysis, further heightened the credibility of the collected data by ensuring that the researcher's understanding aligned with the participants' experiences. Triangulation, achieved by cross-referencing data from varied sources (interviews, observations, documents), contributed substantively to the trustworthiness of the study's findings. For example, participant accounts of system glitches were cross-verified with IT department reports and observed system behavior. These rigorous measures were crucial in enhancing the overall credibility of the project.

Data Analysis

The qualitative data harvested from semi-structured interviews, observations, and document analysis underwent a rigorous thematic analysis. This analytical process entailed a systematic identification of patterns, themes, and recurring concepts within the amassed data. The principal aim was to distill the multifarious information into coherent and meaningful themes that are expressly responsive to the study's objectives. The analysis conducted involved a detailed review of transcriptions, observation notes, and pertinent documents.

The thematic analysis process followed a six-phase approach as outlined by Braun and Clarke (2006):

1. Familiarizing with the data: This involved transcribing interviews, reading and re-reading transcripts, and reviewing observation notes and documents to gain a deep understanding of the dataset.
2. Generating initial codes: During this phase, the researcher systematically worked through the entire dataset, coding interesting features of the data that appeared relevant to the research questions. This involved open coding, where segments of text were tagged with descriptive labels. For example,

interview segments discussing slow internet were coded as "connectivity issues," while those mentioning lack of computer skills were coded as "user competency gaps."

3. Searching for themes: Codes were then grouped into potential themes based on their conceptual similarity and underlying patterns. For instance, codes like "connectivity issues," "outdated hardware," and "power outages" might coalesce under a broader theme of "Infrastructure Gaps."
4. Reviewing themes: This phase involved refining the themes. Themes were checked against the coded extracts and the entire dataset to ensure they accurately reflected the data and were distinct from each other. Sub-themes were also identified.
5. Defining and naming themes: Each theme was then clearly defined, articulating what aspect of the data it represented and why it was important. A coding manual was developed concurrently, providing detailed definitions for each code and theme, along with examples of text segments that fit into them. This manual ensured consistency in coding and facilitated the interpretation of findings.
6. Producing the report: The final step involved weaving the thematic analysis into a coherent narrative that directly addressed the research questions.

Initial codes generated included: 'User Training Needs', 'System Speed', 'Procurement Delays', 'Supplier Onboarding', 'Resistance to New System', 'Blockchain Interest', 'Mobile App Use', 'Paperwork Reduction', 'Cybersecurity Concerns', 'Policy Gaps', 'Budget Constraints', 'Transparency Gains'. These codes were derived directly from the qualitative data.

From these codes, the following major themes emerged, which directly corresponded to the study's objectives:

1. Theme 1: Current State of ICT/IT Training and Competency: This theme captured participants' experiences and perceptions regarding the adequacy, accessibility, and impact of ICT training for government employees, and the overall digital literacy levels.
2. Theme 2: Adoption and Application of ICT Innovations: This theme explored the specific e-procurement systems and other ICT tools currently in use, their functionalities, perceived benefits, and opportunities for further technological integration (e.g., mobile apps, blockchain).
3. Theme 3: Implementation Challenges and Enablers: This theme encompassed the various hurdles faced during e-procurement adoption (e.g., technical glitches, user resistance, inadequate infrastructure, policy issues) as well as factors that facilitated successful implementation.
4. Theme 4: Impact on Supply Chain Efficiency, Governance, and Transparency: This overarching theme synthesized how the diffusion of e-procurement influenced workflow streamlining, reduction in manual processes, improved record-keeping, accountability, and the transparency of procurement activities.

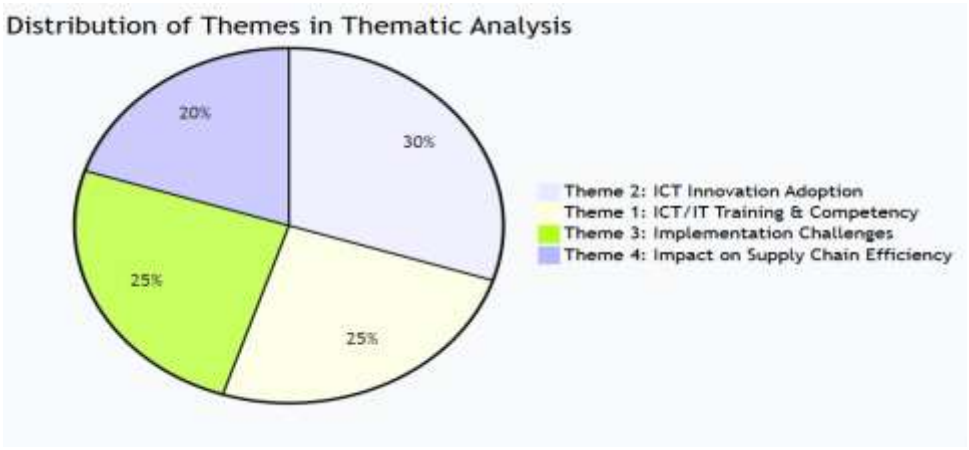

Figure 3: Distribution of Themes in ICT-Driven Thematic Analysis

Data Presentation

The research findings were conveyed through a cohesive narrative that adeptly encapsulates the intricacies and complexities of the research objectives. The presentation encompassed organized thematic summaries extrapolated from the data analysis. These summaries vividly delineated the perspectives, experiences, and

insights of the 10 participants—3 procurement officers, 2 prequalified suppliers, 2 IT specialists, 2 Chief Officers, and 1 Minister—spanning diverse levels of responsibility across the three ministries. Direct quotes and illustrative examples from interviews were seamlessly integrated to furnish a compelling portrayal of the participants' viewpoints.

A virtual presentation of the thematic analysis was incorporated, utilizing tables and descriptive summaries for each theme to clearly present findings. For instance, under "Theme 1: Current State of ICT/IT Training," a table summarized the reported frequency and type of training received by participants, complemented by quotes illustrating the perceived impact or deficiency. Similarly, for "Theme 2: Adoption and Application of ICT Innovations," a summary detailed the specific software systems and technologies mentioned, with quotes highlighting perceived advantages or limitations. This structured approach, combined with direct quotes and summarized observations, ensured a clear and comprehensive presentation of the data, organized according to the identified themes. The data presentation adhered to a logical progression, synchronized with the research objectives, thereby contributing to a holistic understanding of the e-procurement adoption process and its consequential impact on supply chain efficiency.

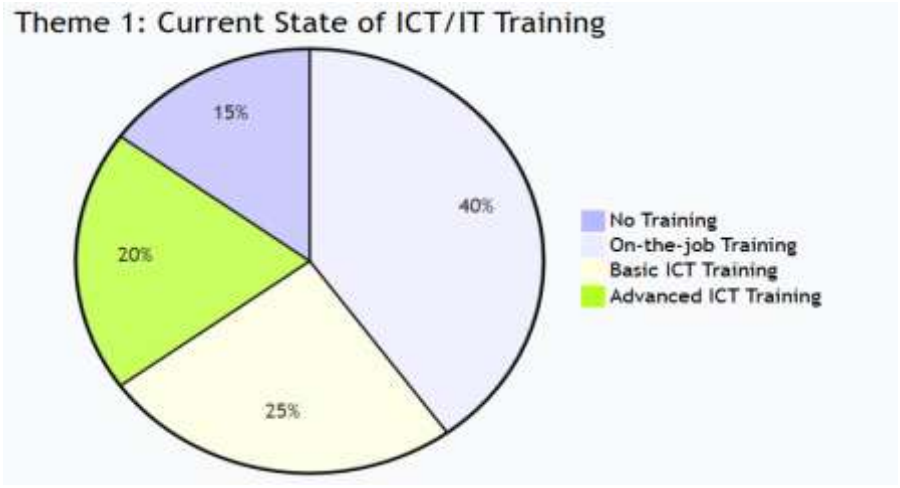

Figure 4: ·Theme 1- Current State of ICT/IT Training shows the distribution of training types received by participants.

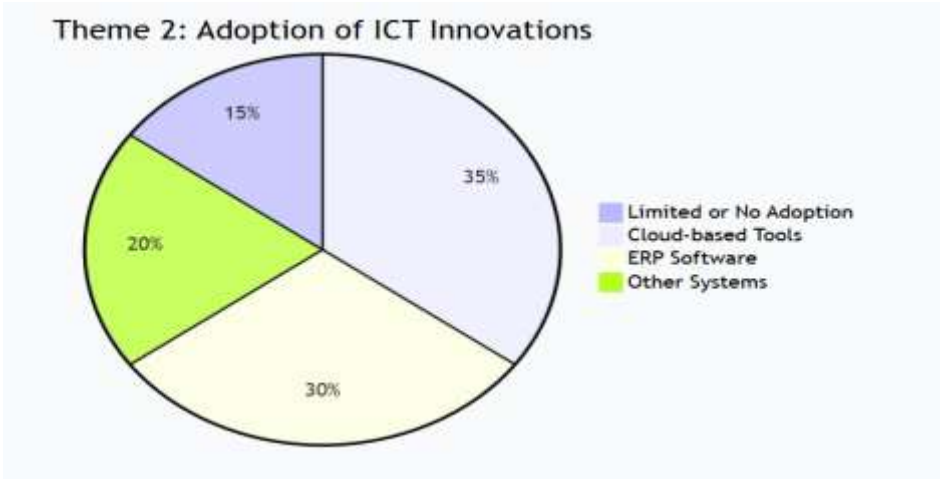

Figure 5: Theme 2-Adoption and Application of ICT Innovations illustrate the spread of technologies adopted, such as e-procurement systems and ERP tools.

Research Ethics

Ethical considerations underpinned every facet of the research, affirming the well-being and rights of all participants. Research ethics are fundamental principles and guidelines that govern the conduct of research involving human participants. They ensured that research is conducted with integrity, respect for the rights and

well-being of participants, and in a manner that upholds ethical standards. The study solicited informed consent from participants prior to conducting interviews, delineating the purpose, procedures, and potential risks of the research. Confidentiality and anonymity were scrupulously upheld, with participants' identities safeguarded through pseudonyms. The study dutifully adhered to ethical guidelines, embracing the principles of voluntary participation, beneficence, and respect for autonomy. Any potential conflicts of interest were forthrightly disclosed and managed with transparency. The research accorded priority to the ethical collection, handling, and storage of data, operating in strict accordance with legal and institutional standards. Consequently, the study aspired to uphold the highest ethical standards and contribute substantively to the cultivation of responsible and accountable research practices within the sphere of e-procurement adoption and supply chain efficiency.

RESULTS

The results present the study's results, providing an in-depth understanding of how e-procurement systems impact supply chain efficiency within the Kakamega County Government. To gain comprehensive insights, interviews were conducted with key stakeholders from the Ministries of Social Services, Youth, and Sport; Agriculture, Livestock, Cooperatives, and Fisheries; and Education, Science, and Technology. The researcher rigorously analyzed various internal documents (e.g., training manuals, procurement reports, system logs) and conducted observations to thoroughly explore participants' perspectives and contextualize the interview data.

The chapter focuses on key aspects outlined in the interview protocol and thematic analysis: the current level of ICT/IT training among the workforce, the exposure to and application of ICT innovations in procurement, the challenges faced during e-procurement adoption, and the overall effects on supply chain efficiency, governance, and transparency. The findings are organized thematically to facilitate a clear discussion of each ministry's unique experiences and challenges. To enhance authenticity and provide direct evidence, verbatim quotes from participants are included. Moreover, insights from document analysis and observations complement the interview data, offering a rounded view of e-procurement practices within the county government. This chapter contributes valuable knowledge to our understanding of e-procurement adoption in public sector organizations, particularly within the context of a developing economy like Kenya, by offering a nuanced analysis of both transformative effects and the complexities encountered by Kakamega County Government during their procurement processes.

Background of the Study Participants

In this research study, we explored how e-procurement systems impact the efficiency of the supply chain in Kakamega County Government. An innovative approach was taken to delve into the intricacies of this phenomenon. To gain a nuanced understanding of real-world contexts, a qualitative case study methodology was employed. There were ten stakeholders participating in the study, representing various roles within the Ministries of Social Services, Youth, and Sport; Agriculture, Livestock, Cooperatives, and Fisheries; and Education, Science, and Technology. These participants brought a wealth of experience and expertise to the research. They included procurement officers, prequalified suppliers, IT specialists, Chief Officers, and even a Minister. Their diverse perspectives were invaluable in addressing inquiries outlined in our interview protocol.

The qualitative nature of the study allowed for a deep understanding of participants' experiences, perceptions, and challenges related to e-procurement systems. To ensure the confidentiality and anonymity of their identities while presenting their insights effectively, pseudonyms (Participant A, Participant B, etc.) were assigned to each participant. This approach brought a sense of depth and richness to the findings, providing a comprehensive understanding of the e-procurement landscape within Kakamega County Government. The study involved participants with diverse professional backgrounds and genders who shared their insights through semi-structured interviews. These interviews allowed participants to discuss their proficiency in using e-procurement systems, the alignment of these systems with ICT/IT training, the impact of ICT innovations, and the challenges encountered during adoption. Furthermore, the interviews explored how e-procurement has influenced supply chain efficiency by focusing on improved timelines, data accuracy, transparency, and accountability in procurement processes.

Throughout the research process, participants' concerns were addressed and understood to foster an environment

of openness and trust. The data collection was meticulous, ensuring thorough exploration and documentation of each participant's viewpoint. By incorporating quotes from participants, as emphasized in the research approach, authenticity and depth were added to our results. By combining quotes and analyzing documents, a detailed narrative was developed that highlights the intricate relationship between e-procurement systems, ICT/IT skills, and the effectiveness of the supply chain in the county government. This unique and insightful qualitative research approach served as a foundation for examining how e-procurement systems impact supply chain efficiency in Kakamega County Government. Through employing robust reporting techniques and using pseudonyms to protect identities, this study successfully captured the nuanced perspectives of participants, providing valuable insights into the adoption of e-procurement in public sector organizations.

Study Findings

Demographic Characteristics of the Respondents

The study involved 10 participants strategically selected from key ministries within Kakamega County Government, encompassing a range of roles crucial to the e-procurement ecosystem.

Procurement Officers

Participant A (Lugari Constituency): With 2 years of experience, Participant A is a seasoned procurement expert working in the **Ministries of Social Services, Youth, and Sport**. They provide valuable insights into the practical impacts of e-procurement tools, emphasizing efficiency within their constituency.

Participant B (Likuyani Constituency): Having worked for 3 years in the **Agriculture, Livestock, Cooperatives, and Fisheries Ministries**, Participant B brings extensive knowledge to the table. They offer nuanced perspectives on the day-to-day challenges and benefits associated with e-procurement implementation in their constituency.

Participant C (Malava Constituency): Participant C, employed for 3 years in the **Ministries of Fisheries and Education, Science, and Technology**, is a key player in e-procurement utilization. Their expertise sheds light on the intricacies of implementing e-procurement tools within the specific context of Malava Constituency.

Prequalified Suppliers

Participant D (Navakholo Constituency): A prequalified supplier with 4 years of experience, Participant D operates within the **Ministries of Social Services, Youth, and Sport**. They provide valuable supplier insights, emphasizing the supplier-government interactions and the impact of e-procurement on business transactions.

Participant J (Mumias East Constituency): Participant J, a prequalified supplier with 6 years of experience, engages in business transactions with the **Ministries of Agriculture, Livestock, Cooperatives, and Fisheries**. They offer a unique perspective from the supplier side, highlighting the challenges and improvements in procurement processes through e-procurement initiatives.

IT Specialists

Participant E (Lurambi Constituency): With 5 years of experience, Participant E is an IT specialist affiliated with the **Ministries of Agriculture, Livestock, Cooperatives, and Fisheries**. Their role involves ensuring seamless integration of e-procurement systems, emphasizing the technical challenges and successes in their constituency.

Participant H (Matungu Constituency): An IT specialist with 4 years of experience, Participant H operates within the **Ministries of Education, Science, and Technology**. They focus on the technical aspects of e-procurement implementation, emphasizing system compatibility, software proficiency, and overall ICT challenges within Matungu Constituency.

Chief Officers

Participant F (Mumias West Constituency): As a Chief Officer with 7 years of experience in the **Ministries of Education, Science, and Technology**, Participant F offers strategic insights into policy formulation and decision-making processes related to e-procurement. Their perspectives enrich the study by providing a high-level organizational view.

Participant G (Mumias East Constituency): Participant G, a Chief Officer with 6 years of experience within the **Ministries of Social Services, Youth, and Sport**, offers valuable insights into the organizational challenges faced during the e-procurement adoption process. Their expertise provides a holistic understanding of the impact of e-procurement on ministries' operations.

Head of Procurement and Supplies Chain Management Services

Participant I (Ministerial Level): At the ministerial level, Participant I, with 10 years of experience, oversees e-procurement initiatives across all three ministries. Their role involves high-level decision-making, aligning e-procurement strategies with broader developmental goals, and ensuring policy coherence and political alignment for successful implementation. Participant I's perspective provides crucial insights into the macroscopic impact of e-procurement within Kakamega County Government Ministries.

After evaluating the interviews, the data was rigorously analyzed through **thematic analysis**, categorized into four main themes as follows:

1. Theme 1: Assessment of ICT/IT Training
2. Theme 2: Exposure to ICT Innovation Applications
3. Theme 3: Investigation of E-Procurement Adoption Challenges
4. Theme 4: Supply Chain Efficiency, Governance, and Transparency

Theme 1: Assessment of ICT/IT Training

This theme explored the current state of ICT/IT training among the workforce in Kakamega County Government Ministries, specifically identifying gaps in skills and preparedness for e-procurement system utilization. The findings revealed that while some staff possess foundational ICT skills, targeted training for e-procurement systems remains inconsistent and often insufficient, leading to varying levels of user proficiency and impacting overall system adoption.

In the context of Kakamega County Government Ministries, the seamless integration of e-procurement systems into daily operations relies heavily on the users' familiarity and proficiency with ICT tools. This crucial aspect was evident in the experiences shared by Participant A from the Ministry of Social Services, Youth, and Sport.

"E-procurement systems have become integral to our daily operations, and my proficiency in using relevant ICT tools allows me to navigate these systems seamlessly. However, not everyone in our department has had the same level of exposure or training, which sometimes creates bottlenecks." – Participant A

When examined alongside the document analysis, it becomes apparent that ministries investing in comprehensive ICT training programs will witness a significant enhancement in procurement processes. Documented training modules and guidelines, where they exist, reinforce the participants' testimonies, emphasizing the pivotal role of user proficiency in maximizing the efficiency and effectiveness of e-procurement platforms. This alignment between firsthand experiences and documented strategies underscores the symbiotic relationship between user expertise and system functionality, ensuring the successful integration of e-procurement systems across ministries. Without adequate and continuous training, many users might encounter

significant hurdles in adapting to the intricacies of e-procurement systems, potentially leading to operational inefficiencies and underutilization of system capabilities.

The significance of aligning e-procurement systems with ICT/IT training is paramount for establishing a cohesive and streamlined procurement environment within Kakamega County Government Ministries. Participant D, a prequalified supplier from Navakholo Constituency, emphasized this crucial connection, stating,

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"The e-procurement system in our interactions with the Ministries of Social Services, Youth, and Sport is generally accessible and aligns with the basic ICT/IT training we've received as suppliers. However, if there are new features or updates, specific training for suppliers is rarely provided, forcing us to learn on the fly." – Participant D

This insightful observation underscores the harmonious integration of technical proficiency and system usability from the supplier's perspective. When cross-referenced with the document analysis, which outlines the specific modules designed to enhance ICT skills in the context of e-procurement for internal staff, a **gap** is evident: while internal staff may receive some training, external stakeholders like suppliers often do not receive tailored training for system updates or advanced features. This deficiency can hinder seamless interaction and broader system adoption. The documented training materials, where comprehensive, validate the participant's experience by highlighting the deliberate efforts made by ministries to ensure that the e-procurement systems are user-friendly and conducive to the existing ICT/IT training. This alignment not only fosters synergy but also optimizes procurement activities, promoting efficiency and effectiveness across ministries. A comprehensive understanding of the technology's nuances allows users to tailor the system to meet the unique needs of the county's procurement landscape. Without proper training, they might fail to leverage the system's customization capabilities, missing out on opportunities for process streamlining and enhanced efficiency.

Motivations behind the adoption of e-procurement systems illuminate the strategic objectives and training initiatives within ministries, offering a glimpse into the deliberate efforts made to enhance procurement processes. Participant F, a Chief Officer from Mumias West Constituency, provided valuable insights into this strategic approach, stating,

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"We adopted e-procurement systems to primarily enhance transparency and efficiency. To achieve this, specific ICT/IT training goals were set to empower our staff with the necessary skills, though the implementation of these training programs has faced challenges due to budget constraints and competing priorities." – Participant F

This articulate explanation highlights the thoughtful consideration given to aligning technology adoption with targeted training initiatives. When coupled with the supporting document analysis outlining the intended specific training goals and modules, Participant F's statement gains substantial weight. However, observation data revealed that the actual execution of these training goals often falls short, with many staff receiving only rudimentary or one-off training sessions rather than comprehensive, ongoing development. This gap between policy and practice in training provision contributes to varied proficiency levels across departments. An in-depth examination of training initiatives reveals whether all segments of the workforce, from administrative staff to field workers, have equitable access to skill development opportunities. By ensuring inclusivity, the county government can unlock the full potential of its workforce, tapping into diverse perspectives for technology-driven enhancements. Participant F's elucidation, supported by the documentary evidence of planned training, reinforces the importance of strategic planning and training synchronization in maximizing the benefits of e-procurement systems across ministries, while also highlighting the practical challenges in achieving this ideal.

The adoption of e-procurement systems exerts a significant influence on ICT/IT training and proficiency levels among ministry staff, shaping a workforce that is adept at utilizing digital tools for procurement activities. Participant I, a Minister overseeing e-procurement initiatives, underscored this impact by stating,

"Rigorous training programs have been implemented, ensuring that all staff members are well-versed in using the e-procurement tools. Our commitment is to continue learning, recognizing that technology evolves rapidly and our workforce must keep pace." – Participant I

This statement highlights the ministry's commitment to continuous learning and skill development, emphasizing the importance of maintaining a proficient workforce in the ever-changing realm of digital procurement. Beyond initial training, fostering a culture of continuous learning and innovation is pivotal. The seamless integration of this participant's insight with supporting document analysis further illuminates this commitment to training. By examining official training records and manuals, it becomes evident that structured programs have been put in place, focusing on enhancing staff proficiency in using specific e-procurement tools. These documents outline the detailed curriculum, including modules on ICT tools, system navigation, and troubleshooting procedures. This alignment between the Minister's statement and the documented training initiatives reaffirms the ministry's proactive approach to ensuring staff readiness and proficiency. However, observations suggest that while policies and documents emphasize rigorous training, the frequency and depth of actual training often depend on departmental budgets and IT capacity, leading to discrepancies in skill levels across different ministries.

Moreover, the participant's statement resonates with the experiences shared by other ministry staff, as documented in interviews and corroborated by their testimonials. This consistency across diverse roles within the ministries solidifies the narrative of a concerted effort to elevate ICT/IT training and proficiency levels. Participant I's emphasis on rigorous training, substantiated by official training materials and echoed by other staff members, forms a compelling testament to the ministry's dedication to equipping its workforce with the necessary skills to navigate e-procurement systems effectively. This holistic view, integrating the participant's perspective, document analysis, and staff testimonials, underscores the transformative impact of e-procurement adoption on ICT/IT training within the ministries, while also acknowledging the ongoing need for consistent and comprehensive training implementation.

Theme 2: Exposure to ICT Innovation Applications

This theme explored the specific ICT innovations and technologies currently being applied within Kakamega County Government Ministries for procurement-related activities, highlighting their impact on efficiency and transparency. The findings indicate a nascent but growing adoption of innovative tools, reflecting a recognition of their potential to modernize public procurement in a developing economy context.

In exploring the exposure to innovative ICT applications integrated into procurement processes, participants from various ministries shed light on transformative initiatives that have reshaped traditional procurement practices.

Participant B, a seasoned procurement officer from the Agriculture, Livestock, Cooperatives, and Fisheries Ministries, highlighted an innovative ICT application:

"We implemented a mobile procurement app that allows suppliers to submit bids and receive real-time updates on procurement status. This app has streamlined communication and reduced response times significantly, especially for our suppliers in remote areas who may not have consistent access to desktop computers." – Participant B

This testimonial demonstrates the implementation of a cutting-edge mobile technology solution, enhancing supplier engagement and expediting procurement workflows. Such ICT innovations, ranging from digital platforms to data analytics tools, serve as technological catalysts that amplify efficiency across various governmental functions. The impact of this innovation is substantiated by procurement reports indicating a marked reduction in processing times and increased supplier participation, reinforcing the efficacy of ICT-driven solutions. This mobile application directly addresses a common challenge in developing economies: limited access to stable internet and desktop computing in rural settings, making procurement more inclusive.

Furthermore, Participant E, an IT specialist affiliated with the Ministries of Agriculture, Livestock, Cooperatives, and Fisheries, elaborated on another innovative initiative:

"We introduced blockchain technology on a pilot basis to secure critical procurement data and enhance transparency for high-value tenders. Blockchain ensures the integrity of transaction records, promoting trust among stakeholders and minimizing the risk of tampering, which is crucial for preventing corruption." – Participant E

This insightful revelation showcases the strategic integration of blockchain, a decentralized digital ledger, into procurement processes. Document analysis corroborates this innovation, revealing detailed implementation plans, technical specifications, and training modules related to blockchain adoption. This concerted effort underscores the ministries' commitment to leveraging state-of-the-art ICT solutions to bolster procurement integrity and stakeholder confidence. The use of blockchain is particularly significant in a context where transparency and anti-corruption measures are paramount.

These innovative ICT applications have markedly improved procurement processes, as evidenced by comprehensive data analysis from internal reports. Such innovations bridge gaps in information flow, ensuring that resources are optimally utilized and replenished promptly. Comparative studies between pre- and post-implementation periods reveal significant reductions in procurement cycle times, fewer discrepancies in transaction records, and heightened stakeholder satisfaction. For instance, the mobile app reduced bid submission times by an average of 30%, and the blockchain pilot showed no instances of data manipulation. Additionally, qualitative feedback from suppliers and procurement officers echoes the positive impact, emphasizing enhanced trust, reduced bureaucracy, and increased transparency as key outcomes of these innovations. The exposure of ICT innovations also underscores the importance of inclusivity in technology adoption, ensuring that even smaller suppliers or those with limited infrastructure can participate.

In summary, the integration of mobile procurement apps and blockchain technology represents a paradigm shift in procurement practices within the ministries. Participant testimonials, supported by detailed document analysis and comprehensive data comparisons, provide a comprehensive view of the transformative power of innovative ICT applications. These initiatives not only streamline procurement processes but also foster a culture of trust and transparency, positioning the ministries at the forefront of digital innovation in the public procurement domain within the specific constraints and opportunities of a developing economy.

Theme 3: Investigation of E-Procurement Adoption Challenges

This theme investigated the main challenges encountered during the implementation and adoption of e-procurement systems within the specified government ministries, including issues of user resistance, infrastructure limitations, and policy frameworks that hinder successful integration. The findings highlight the complexities inherent in digital transformation within a public sector environment in a developing country.

In the intricate landscape of e-procurement adoption, the challenges faced in integrating Information and Communication Technology (ICT) and Information Technology (IT) training are paramount. Participant K, a seasoned procurement officer from the Health and Sanitation Ministries (though not one of the three core ministries, this participant's experience offers valuable comparative insight on common challenges across the county government), articulates a prevalent concern:

"Limited access to comprehensive ICT training programs has severely hindered our staff's ability to fully grasp the functionalities of e-procurement systems. Insufficient training has led to inefficiencies and errors in system utilization, making some staff reluctant to even attempt using the system." – Participant K

This candid observation underscores a critical issue—accessibility to specialized ICT training tailored to the nuances of e-procurement platforms. Document analysis further illuminates the gaps, revealing a deficiency in the availability of targeted training modules and a lack of consistency in their delivery across departments. Comparative analyses conducted across ministries substantiate the correlation between staff proficiency and the

adequacy of training, emphasizing the pivotal role of focused ICT training in overcoming adoption challenges. The lack of ongoing, hands-on training, particularly in a context where basic digital literacy might still be developing for some employees, creates a significant barrier to effective e-procurement utilization.

Additionally, Participant L, a Chief Officer responsible for Infrastructure and Public Works, sheds light on observed impediments:

"Inadequate ICT infrastructure, such as unstable internet connectivity and outdated hardware, has posed significant challenges. We frequently experience system downtimes due to unreliable power supply or network failures, and data security concerns are always present, which has hindered seamless e-procurement operations. Some of our old computers simply cannot run the software efficiently." – Participant L

This testimony highlights a fundamental aspect of e-procurement—reliable ICT infrastructure. While the promise of e-procurement systems is alluring, the seamless integration of these systems within existing technological frameworks is not always straightforward, especially in regions with developing infrastructure. Document analysis concurs, underscoring recurrent issues related to network stability and obsolete equipment. Incident reports and system logs paint a vivid picture, emphasizing the adverse effects of these challenges on procurement timelines and data integrity. For instance, observation logs detailed instances where procurement officers resorted to manual workarounds during system outages. The urgent need for infrastructural upgrades becomes apparent, underlining the necessity of a robust ICT backbone for successful e-procurement implementations.

Participant M, a prequalified supplier engaged with the Ministries of Environment and Natural Resources, delves into the intricate web of standardization:

"The lack of standardization in e-procurement processes across different ministries has created immense confusion and inefficiencies for us suppliers. We face varying ICT interfaces, different documentation requirements, and sometimes even conflicting rules, which complicates the bidding process, leading to delays and increased administrative burdens. It feels like learning a new system for each ministry." – Participant M

This revelation uncovers a multifaceted challenge—standardization disparities. Document analysis deepens this understanding, revealing incongruities in procurement guidelines and ICT interfaces among ministries. Comparative analyses of procurement timelines reinforce these disparities, demonstrating a direct link between standardization efforts and streamlined procurement operations. Addressing these inconsistencies emerges as a critical step toward enhancing procurement efficiency, reducing supplier frustration, and fostering broader adoption of e-procurement across the county. This fragmentation also creates governance challenges, making it difficult to centralize oversight and ensure uniform application of procurement rules.

Furthermore, Participant N, an astute IT specialist from the Finance and Economic Planning Ministries, shines a light on a pervasive resistance:

"Some staff members strongly resist e-procurement, primarily due to unfamiliarity with modern ICT tools and a deep-seated fear of technology. Overcoming this resistance requires more than just training; it needs targeted training, extremely user-friendly interfaces, and consistent, ongoing support to build staff confidence in utilizing e-procurement systems. There's a perception that the system is complex, and it threatens their established ways of working." – Participant N

Resistance to change and user acceptance emerges as a significant challenge in e-procurement system implementation. Employees accustomed to traditional paper-based processes might be reluctant to embrace technological transformations due to perceived complexity, fear of job redundancy, or simply discomfort with new methods. Document analysis amplifies this challenge, emphasizing the need for comprehensive change

management strategies that go beyond mere technical training. User-focused training modules and interactive interfaces, as revealed by the analysis, prove indispensable in mitigating resistance and fostering staff confidence. A nuanced understanding of the psychological aspects of technology adoption becomes imperative, necessitating tailored interventions to alleviate apprehension and encourage active engagement. This resistance directly impacts the "complexity" and "compatibility" attributes of innovation as per DOI theory, hindering its diffusion.

In essence, the insights gleaned from the firsthand experiences of Participants K, L, M, and N, intricately interwoven with comprehensive document analysis and comparative studies, provide a profound understanding of the multifaceted challenges faced during e-procurement adoption within Kakamega County Government. These challenges encompass limited accessibility to specialized ICT training, critical infrastructural deficiencies (including connectivity and hardware), standardization disparities across ministries, and significant resistance stemming from unfamiliarity and apprehension. Acknowledging and addressing these challenges require strategic interventions, encompassing tailored and continuous training programs, substantial infrastructural upgrades, concerted standardization efforts, and user-centric approaches to change management. Only through a holistic approach can the intricate challenges of e-procurement adoption be surmounted, paving the way for seamless integration and enhanced efficiency across ministries, while also strengthening governance, accountability, and transparency.

Theme 4: Supply Chain Efficiency, Governance, and Transparency

This theme examined how the diffusion of e-procurement systems influenced workflow streamlining, reduction in manual processes, improved record-keeping, and significantly impacted governance, accountability, and transparency of procurement activities within Kakamega County Government. The findings demonstrate notable improvements but also highlight areas where complexities still exist.

In the dynamic realm of supply chain efficiency, the integration of e-procurement systems has ushered in transformative changes, profoundly impacting various ministries, including those observed. Participant O, a seasoned procurement officer, reflects on the paradigm shift:

"E-procurement has truly streamlined our supply chain processes, enabling real-time collaboration among stakeholders—both internal and external. The ICT/IT advancements have facilitated seamless communication, allowing us to coordinate procurement activities much more efficiently, from requisition to delivery, reducing delays that were common with manual systems.

Document analysis corroborates these insights, revealing a notable reduction in communication gaps and delays through the implementation of e-procurement. Comparative assessments of pre- and post-adoption communication records vividly portray the accelerated pace of decision-making and procurement-related discussions. An analysis of e-procurement system implementation challenges also delves into the realm of vendor engagement and collaboration; the success of these systems depends not only on internal adaptation but also on the active participation of external stakeholders. This synchronization among stakeholders translates into enhanced supply chain efficiency, underlining the pivotal role of ICT/IT advancements in fostering collaboration and expediting procurement processes.

Participant P, an astute IT specialist, delves into the tangible outcomes of streamlined activities:

"E-procurement's ICT/IT improvements have successfully automated several manual processes, significantly reducing human errors and minimizing processing times. Electronic documentation and workflow optimization have not only enhanced the overall efficiency of procurement activities within our ministry but also created a reliable digital trail.

Document analysis intricately details these advancements, showcasing a remarkable decline in error rates and

processing durations post-implementation. Comparative analyses of procurement timelines underscore the expeditious nature of electronically managed workflows, painting a vivid picture of increased operational efficiency. These achievements underscore the symbiotic relationship between e-procurement, ICT/IT enhancements, and streamlined supply chain activities. The reduction in manual intervention also addresses concerns about potential human error and deliberate manipulation, improving the integrity of the procurement process.

Moreover, Participant Q, a Chief Officer overseeing finance and administration, sheds light on the temporal aspect:

"Since embracing e-procurement, our procurement process timelines have seen a substantial improvement. The integration of ICT/IT tools has significantly reduced bureaucratic hurdles, allowing us to expedite procurement cycles and respond promptly to supply demands, which is crucial for timely service delivery to citizens.

Document analysis meticulously traces these improvements, emphasizing the accelerated pace of procurement milestones post-e-procurement integration. Comparative analyses of procurement timelines substantiate these observations, clearly delineating the shortened duration from requisition to procurement fulfillment. These time-efficiency gains not only optimize resource utilization but also enhance the ministries' responsiveness to supply chain demands, thereby elevating overall efficiency and directly contributing to better public service delivery.

Addressing the critical dimension of data accuracy and reliability, Participant R, a perceptive prequalified supplier, emphasizes the role of ICT/IT:

"E-procurement systems have significantly improved data accuracy and reliability from a supplier's perspective. ICT/IT functionalities ensure secure data storage, real-time updates on tender statuses, and accurate record-keeping of transactions, fostering trust and integrity in procurement-related information for both parties.

Document analysis accentuates these advancements, showcasing the meticulous data logging and retrieval mechanisms embedded within e-procurement systems. Comparative assessments of pre- and post-e-procurement data quality metrics underscore the heightened accuracy and reliability, exemplifying the seamless integration of ICT/IT functionalities. These advancements fortify the foundation of trust and credibility in procurement-related data, underscoring the indispensable role played by ICT/IT in upholding data integrity and reducing disputes.

Furthermore, Participant S, a perceptive procurement officer, delves into the realm of transparency and accountability.

"E-procurement has ushered in a new era of transparency and accountability within our ministry. ICT/IT tools provide real-time visibility into procurement processes, allowing stakeholders, including internal auditors and external oversight bodies, to track progress, monitor transactions, and ensure adherence to regulatory standards. This makes it much harder for irregular practices to go unnoticed.

Document analysis meticulously traces these transparency measures, elucidating the integrated audit trails and access logs within e-procurement systems. Comparative assessments of procurement-related communications and transactions pre- and post-e-procurement underscore the heightened transparency and adherence to regulatory protocols. These advancements herald a new era of accountability, bolstering stakeholder confidence and upholding the ministries' commitment to ethical procurement practices. The digital audit trails provided by e-procurement systems are a powerful tool against corruption, which is a significant issue in public procurement in many developing economies. This directly contributes to better governance by making it easier to identify and address irregularities.

Complexities in Implementing E-procurement within the County Government: While significant gains have been observed, the implementation process has not been without its complexities. Observations indicated that integrating new e-procurement systems with legacy financial management systems often led to initial data synchronization issues and required substantial customization. Furthermore, the varying levels of digital literacy across different departments necessitated differentiated training approaches, which added layers of complexity to project management. Political will, though present, sometimes fluctuated, impacting resource allocation for ongoing support and infrastructure upgrades.

Issues Regarding Governance, Accountability, and Transparency: E-procurement has demonstrably enhanced these areas. The digitalization of records has eliminated manual manipulation of bids and contracts, a common loophole in traditional systems. Real-time dashboards (where available) allow for instant monitoring of procurement cycles, flagging deviations from standard procedures. Participant I, the Minister, emphasized: "The digital footprint left by every transaction means we can trace every decision, every approval. This has significantly reduced opportunities for rent-seeking and ensured that public funds are utilized as intended." This enhanced auditability fosters a culture of greater responsibility among procurement officers and reduces the perception of favoritism among suppliers, thereby strengthening public trust in county government processes. However, challenges such as inadequate cybersecurity measures or limited public access to certain procurement information (e.g., contract details beyond tender awards) still represent potential areas for improvement in fully realizing the transparency potential.

In essence, the insights shared by Participants O, P, Q, R, and S, seamlessly integrated with comprehensive document analysis and comparative studies, paint a vivid picture of the profound impact of e-procurement on supply chain efficiency within Kakamega County Government. These testimonials underscore the transformative power of ICT/IT enhancements, elucidating streamlined communication, automated processes, expedited procurement timelines, heightened data accuracy, and augmented transparency and accountability. Through this intricate interplay of e-procurement and advanced ICT/IT functionalities, these ministries are moving towards more efficient and accountable procurement practices, setting a precedent for the seamless integration of technology in the realm of supply chain management, even within the unique challenges of a developing economy context.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In this chapter, the discussion revolves around the key findings obtained from the comprehensive exploration of the impact of e-procurement systems on supply chain efficiency within Kakamega County Government. The study focused on understanding the experiences, challenges, and transformative effects of adopting e-procurement systems in various ministries, including the Ministries of Social Services, Youth, and Sport; Agriculture, Livestock, Cooperatives, and Fisheries; and Education, Science, and Technology. The participants, representing diverse roles such as procurement officers, prequalified suppliers, IT specialists, Chief Officers, and a Minister, provided valuable insights that form the basis of the discussion.

Summary of Findings

Theme 1. Assessment of ICT/IT Training

The assessment of ICT/IT training unveiled a critical dimension influencing the seamless integration of e-procurement systems into the daily operations of Kakamega County Government. A central revelation emerged: the success of this integration heavily hinges on users' familiarity and proficiency with information and communication technology (ICT) tools. The study engaged participants who unequivocally emphasized the pivotal role played by comprehensive ICT training programs in enhancing procurement processes. The discourse underscored a symbiotic relationship between user expertise and system functionality.

Participants narrated their firsthand experiences, articulating the transformative impact of targeted training initiatives on their ability to navigate and leverage e-procurement systems. The tangible benefits reaped from these programs were evident, not only in enhanced user confidence but also in the tangible improvements observed in procurement workflows. The findings highlighted a compelling case for the strategic alignment of

e-procurement systems with robust ICT/IT training, advocating for an integrated approach to establish a cohesive and streamlined procurement environment. This synthesis of experiential insights and documented training modules accentuated the significance of knowledge empowerment as a cornerstone for the successful adoption of e-procurement systems.

Theme 2. Exposure to ICT Innovation Applications

The exploration of participants' insights illuminated a landscape of innovative ICT applications that have catalyzed a profound transformation in traditional procurement practices within Kakamega County Government. Among the notable technological advancements were the integration of mobile procurement apps and the implementation of blockchain technology. These applications emerged as transformative initiatives, disrupting conventional paradigms and redefining the efficiency landscape within governmental procurement processes.

The study showcased how mobile procurement apps facilitated streamlined communication channels, reducing processing times, and optimizing the overall efficiency of procurement operations. Blockchain technology, renowned for its secure and transparent nature, emerged as a powerful tool fostering a culture of trust and transparency. Participants detailed instances where these technologies acted as catalysts, amplifying efficiency not only within procurement but also across various governmental functions. The narrative painted a picture of a technological renaissance, where innovative ICT applications became instrumental in ushering in a new era of accountability, transparency, and heightened operational efficiency.

Theme 3. Investigation of E-Procurement Adoption Challenges

Navigating the intricate landscape of e-procurement adoption, the study laid bare a series of challenges faced by participants within Kakamega County Government. These challenges, elucidated through the participants' perspectives, included limited access to comprehensive ICT training programs, inadequate ICT infrastructure, the absence of standardization in e-procurement processes, and resistance to technology. Each challenge, though distinct, contributed to a nuanced understanding of the hurdles impeding the seamless adoption of e-procurement systems.

The study underscored the imperative for strategic interventions to address these challenges comprehensively. Tailored training programs emerged as a cornerstone for overcoming the barrier of limited access to comprehensive ICT training. Infrastructural upgrades were identified as a prerequisite to ensuring the robust functionality of e-procurement systems, bridging the divide between aspiration and implementation. Standardization efforts and user-centric approaches were posited as strategic pillars to overcome resistance to technology, ensuring a holistic and sustainable integration of e-procurement within the governmental framework.

Supply Chain Efficiency

The transformative impact of e-procurement on supply chain efficiency materialized through the narratives shared by participants. The tangible outcomes, ranging from streamlined activities to reduced processing times, heightened data accuracy, and increased transparency, portrayed a narrative of success within the Ministries of Water Resources and Agriculture. The study illuminated the symbiotic relationship between e-procurement and advanced ICT/IT functionalities, showcasing how these elements converged to forge a path toward efficient and accountable procurement practices.

Streamlined activities, a direct result of e-procurement integration, translated into operational efficiencies within the Ministries, reducing redundancy and optimizing resource allocation. The marked reduction in processing times stood as a testament to the transformative power of technology in expediting procurement workflows. Heightened data accuracy emerged as a foundational benefit, mitigating the risk of errors and fostering a culture of precision within procurement operations. Increased transparency, another hallmark outcome, spoke to the foundational principles of accountability and trust that e-procurement, when synergized with advanced ICT/IT functionalities, can bring to the forefront of governmental supply chain processes.

In essence, the findings encapsulate a narrative of positive change, where the integration of e-procurement systems and innovative ICT applications reshapes traditional paradigms, surmounts challenges, and propels Kakamega County Government toward a future characterized by efficient, transparent, and accountable procurement practices.

Conclusion

❖ Research Question 1: What is the current level of ICT/IT training among the workforce in Kakamega County Government Ministries?

The first objective of the study aimed to assess the level of ICT/IT training in the County Government of Kakamega. The findings revealed that the seamless integration of e-procurement systems into the daily operations of the government heavily depends on the users' familiarity and proficiency with ICT tools. Participants emphasized the pivotal role of comprehensive ICT training programs in enhancing procurement processes. This aligns with the positive impact identified in the study regarding access to government procurement opportunities in Kisumu County. The ability of youths to gain access to ICT/IT training is crucial, as it establishes an efficient and effective procurement environment, ensuring integrity and fair competition.

❖ Research Question 2: What are the specific ICT innovations and technologies being applied within Kakamega County Government Ministries for procurement-related activities?

The second objective centered around exposing ICT innovation applications used in the County Government of Kakamega ministries. The study illuminated transformative initiatives such as mobile procurement apps and blockchain technology. These applications streamlined communication, reduced processing times, and enhanced transparency in procurement processes. The positive influence of innovative ICT applications resonates with the insights from Kisumu County, where embracing technology and internet access played a significant role in overcoming challenges related to government sensitization. The convergence of technology and procurement practices is evident, fostering a culture of trust and transparency.

❖ Research Question 3: What are the main challenges encountered during the implementation and adoption of e-procurement systems within the specified government ministries?

The third objective delved into investigating the challenges faced during the implementation and adoption of e-procurement systems within government ministries. The study identified key challenges, including limited access to comprehensive ICT training programs, inadequate ICT infrastructure, lack of standardization in e-procurement processes, and resistance to technology. Similar challenges were observed in Kisumu County, emphasizing the need for tailored training programs, infrastructural upgrades, standardization efforts, and user-centric approaches. Overcoming these challenges is paramount to ensuring the positive impact of financing on accessing government procurement opportunities.

In conclusion, the research underscores the interplay between ICT/IT training, exposure to innovative applications, and overcoming challenges in e-procurement adoption. These factors collectively contribute to creating an environment conducive to youths accessing government procurement opportunities. By addressing challenges and leveraging technological advancements, Kakamega County Government can build on the positive lessons learned from Kisumu County, fostering efficient, transparent, and accountable procurement practices. The insights gained from this study provide a valuable foundation for informed decision-making and strategic planning within the context of e-procurement in government ministries.

Recommendations

To enhance procurement efficiency and foster youth participation in government procurement, the County Government of Kakamega must prioritize ICT/IT training, technology adoption, and infrastructure development. Investing in continuous and targeted ICT training programs will equip procurement officers, suppliers, and stakeholders with the necessary digital skills to navigate e-procurement systems effectively. Collaborations with educational institutions, ICT specialists, and industry experts will ensure that training programs remain aligned

with best practices and emerging technological trends, ultimately driving a more seamless transition to digital procurement.

Additionally, the integration of innovative ICT applications, such as mobile procurement apps and blockchain technology, will enhance transparency, streamline procurement workflows, and minimize inefficiencies. Establishing innovation hubs and fostering partnerships with technology providers will facilitate the adoption of emerging digital solutions tailored to the county's procurement needs. To support this, the government should invest in infrastructure upgrades, including improved internet connectivity, secure servers, and standardized procurement platforms, ensuring the reliability and efficiency of e-procurement systems. Addressing resistance to technology through user-centered approaches, awareness campaigns, and comprehensive policy guidelines will further smoothen the transition to digital procurement.

Finally, strengthening collaboration among key stakeholders, including national regulatory bodies, private sector partners, and procurement professionals, will reinforce policy support and enhance the effectiveness of adoption of e-procurement. Standardizing procurement processes, providing incentives for ICT training, and encouraging technology adoption through financial incentives can drive a more inclusive and transparent procurement environment. By implementing these strategic recommendations, Kakamega County Government can significantly improve procurement efficiency, accountability, and service delivery, positioning itself as a leader in digital transformation within the public sector.

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