Int Journal of Social Sciences Management and Entrepreneurship 9(2): 120-136 2025

ISSN 2411-7323

www.sagepublishers.com

INFORMATION COMMUNICATION TECHNOLOGIES AND KNOWLEDGE MANAGEMENT IN THE PUBLIC SERCTOR, KENYA

[1] Njagi Elizabeth Wanjiku, [2] Dr. Mose Thomas

[1] Msc. Student, of Jomo Kenyatta University of Agriculture and Technology

[2] Lecturer, Jomo Kenyatta University of Agriculture and Technology

ABSTRACT

This research sought to establish the role of ICTs in managing knowledge in the public sector in Kenya. The study assessed the impact of ICT human resource capacity on knowledge creation, storage and retrieval in public sector in Kenya. It also evaluated the impact of ICT processes such as workflows and system integrations. The study employed descriptive research design. The target population for the study was 226 employees drawn from eight Technical Directorates in the Office of the Deputy Chief of Staff and Head of Public Service and the Ministry of Public Service. Purposeful sampling and stratified random sampling were used to select the sample size of 144 respondents from eight Technical Directorates in the Office of the Deputy Chief of Staff and Head of Public Service and the Ministry of Public Service. An online questionnaire was used to gather primary data. The information gathered was compiled, coded, tabulated and reviewed to check for errors and omissions. Frequency tables, means and percentages were used to present the results. Statistical Packages for Social Science (SPSS) version 25 was used to process the questionnaire responses and analyze data. A pilot study was conducted before the main study. In the main study, a total of 136 out of 144 questionnaires were returned yielding an extraordinary response rate as at 94.44%. The study was guided by a multiple regression model to study the role of ICTs and knowledge management in the public sector. The Correlation was significant at the 0.01 level (2-tailed). The results suggest that the independent variables ICT human resources, ICT processes have a meaningful and measurable impact on knowledge management in the Public Sector. The findings further revealed that the staff possess ICT skills but there were gaps in continuous training and capacity building. ICT processes made work easier but required standardization. The study revealed inadequate system upgrades due to insufficient budgets or proper planning hence suggesting that infrastructure alone is insufficient in driving knowledge management outcomes unless it is strategically integrated with investments in ICT human resources, process optimization. dditionally, adopting emerging technologies such as artificial intelligence and big data analytics can optimize information processing and decision-making and proper investments planning in terms of budgets and acquisition of scalable technologies that can serve for substantial periods of time.

Key Words: Information Communication Technologies, Knowledge Management, Public Sector, ICT human resource capacity, ICT processes

Background of study

The 21st Century, commonly referred to as the digital era is a time when the world is experiencing dynamic technological advancement in all sectors. The digital era is marked by the rapid and seamless flow of information, profoundly transforming how knowledge is created, shared, and accessed across society (Van & de Waal, 2018). Information and Communication Technologies (ICTs) have profoundly transformed various facets of human life, including healthcare, education, work, and entertainment. They facilitate the rapid exchange of information, enhance access to services, and foster innovation across multiple sectors, (Lewis, *et al.*, 2021). ICTs refer to the diverse set of technological tools and resources used to create, store, manage, transmit, and exchange information. These technologies include computers, the internet, broadcasting technologies, telecommunications, and more recently, innovations like cloud computing, artificial intelligence (AI), and the Internet of Things (IoT). A study by Hamad (2018) reviewed the role of ICT in knowledge management processes and found that as businesses adopt new technologies to gain a competitive edge, the function of ICT has evolved considerably. E-government refers to a government's adoption and use of information technologies such as wide area networks, the internet and mobile computing that have the ability to transform relationships with citizens, businesses, and other arms of government, World bank, (2019).

Statement of the Problem

Information communication technologies (ICTs) play a pivotal role in enhancing knowledge management practices within organizations. The Public Sector is mandated to drive efficiency, transparency and accountability in public service delivery. The government of Kenya has made significant investments in the ICT sector as per the budgets for 2022/2023: Ksh 15.6 billion (~$112 million), 2023/2024: Ksh 15.1 billion (~$108.4 million) and 2024/2025: Ksh 16.3 billion (~$125.3 million). However, despite these huge investments in ICTs, knowledge management has been problematic in the Kenyan public sector.

According to Josephat and Guyo, (2017), 50% of government ministries lacked well defined knowledge management frameworks, less than 12% had integrated knowledge management strategies into their overall corporate plans while many lacked the tools and skills necessary to measure knowledge management performance effectively. The study revealed that most government ministries lacked technology solutions tailored to knowledge management needs. The baseline survey by the State Department for Economic Planning (2023), revealed that 66% of public servants have only a moderate awareness of knowledge management and 59% recognize its importance at a similar level. Notably, only 43% acknowledge knowledge management significance to their institutions, indicating a gap between awareness and practical application.

A study by Ndiege and Wamuyu, (2019) revealed that county governments in Kenya often operate with isolated and uncoordinated KM practices and frequently use separate IT systems, leading to siloed information that hinder effective knowledge sharing. The study also revealed that manual filing systems persist in many government institutions, impeding efficient knowledge storage and retrieval and while some departments have adopted digital tools, their usage remained limited and unstandardized across the public sector. The Public sector encounters significant knowledge management challenges such as fragmented systems that lack critical integrations; inadequate use of repositories; inadequate ICT equipment for users; low levels of digitalization, lack of knowledge classification and insufficient ICT training and

support. These challenges inhibit timely and quality decision making by the policy makers and compromises on information security.

Knowledge is now considered an important factor of production and for wealth creation as indicated in the economic survey report (KNBS, 2020), that knowledge and knowledge management play a key role in the growth of the economy where its' sustained growth is expected to increase efficiency in the use of resources, generate employment, and increase Kenya's competitiveness. Josephat and Guyo, (2017), recommended that government Ministries in Kenya should adopt integrated knowledge sharing systems to facilitate the Knowledge Management process. Existing literature does not fully examine, explain and articulate the benefits of ICT tools and technologies in knowledge management, (Jumba, *et al.,* 2020). This study sought to establish the role of ICTs in enhancing knowledge management in the Public Sector in Kenya. The findings and recommendations of this study are meant to guide policy and decisions that involve effective application of ICTs in Knowledge Management, where the recommendations made may be implemented within the entire Public Service. The findings have also contributed to the existing body of knowledge.

General Objective of the study

To establish the role of ICTs in enhancing knowledge management in the Public Sector in Kenya.

Specific Objectives of the Study

i. To analyze ICT human resource capacity on knowledge management in the Public Sector in Kenya.
ii. To evaluate ICT processes on knowledge management in the Public Sector in Kenya.

LITERATURE REVIEW

Theoretical Review

Socio-Technical Systems Theory (STS)

The Socio-Technical Systems (STS) Theory, developed by Eric Trist and Fred Emery in the 1950s, focuses on the interplay between social and technical systems in organizations. The theory emerged from research into coal mining methods, where it was found that technological advances alone, without considering human social systems, led to poor outcomes like lower job satisfaction and reduced productivity (Trist & Bamforth, 1951). STS emphasizes that both social (people, relationships, culture) and technical (tools, systems, processes) subsystems must be integrated and optimized together for organizational success. In practice, STS suggests that organizations achieve better outcomes when both the human and technological systems are harmonized, as failure to do so can result in inefficiencies and resistance to technology adoption. The theory advocates for a participatory approach, where employees are involved in the design and implementation of technology, leading to greater acceptance and better integration (Mumford, 2006).

STS has been widely applied in various sectors to study how organizations balance human and technological needs. For instance, Baxter and Sommerville (2011), found that integrating healthcare professionals' feedback into the design of electronic health records led to better system adoption and more efficient healthcare delivery. Similarly, Mumford (2006) showed that involving employees in technology development increased acceptance rates in the public sector. In this study, STS is used to explore how ICT tools interact with human factors within

Kenya's Public Sector. The research examined how the Public Sector's ICT systems align with employee behaviors, organizational culture, and knowledge management practices. It has assessed the role of employee involvement, ICT competency, and security practices in the successful adoption and utilization of ICT solutions. By applying STS, the study aims to provide recommendations for optimizing both the technical and human aspects to improve knowledge management and service delivery in the Ministry.

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), developed by Fred Davis in 1989, explains how users come to accept and use technology. It posits that the perceived usefulness (PU) and perceived ease of use (PEOU) of a technology are the two primary factors influencing users' decisions to adopt and use it. PU refers to the belief that using a technology will improve job performance, while PEOU refers to the ease with which users perceive the technology can be used without difficulty (Davis, 1989). TAM builds on the Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975), and has been widely applied to understand technology adoption in various settings, including public administration, healthcare, and education. The model suggests that users are more likely to adopt technology if they believe it is both useful and easy to use. Over time, TAM has been extended, such as through TAM3 by Venkatesh and Bala (2008), which incorporates factors like user experience and voluntariness, providing a more comprehensive explanation of technology adoption. In the context of e-governance, studies like Dwivedi et al. (2019) have shown that perceptions of the benefits of digital services and trust in the government are crucial for adoption. This reinforces TAM's argument that the perceived usefulness and ease of use of technology play a significant role in user acceptance.

For the Public Sector in Kenya, TAM provides a framework for understanding how employees adopt and use ICT tools for knowledge management. The theory has helped the study explore how employees' perceptions of the benefits and ease of use of ICT tools influence their adoption. It helped examine whether employees' reluctance to use these tools stems from a belief that technology does not improve their job performance or that it is difficult to use. The research has also investigated which ICT processes employees engage with and how their attitudes affect knowledge management within the Ministry. The study used TAM to propose strategies to improve ICT tool acceptance, such as targeted communication efforts to highlight the benefits of the tools and training initiatives to enhance usability perceptions. Ultimately, TAM helped identify ways to overcome adoption barriers, thus improving knowledge management effectiveness in the Ministry.

Conceptual Framework

Conceptual framework is a structured representation of the key concepts, variables, and relationships within a research study. It serves as a guiding tool that connects the research objectives, methodology, and analysis, providing clarity and direction throughout the research process, (Van, 2020). By organizing and defining these elements, a conceptual framework helps researchers articulate their rationale, justify their study design, and interpret their findings within a coherent structure. Conceptual framework provides value in research by outlining the parameters of the investigation and concentrating on factors and their relationships, it offers clarification. A strong conceptual framework connects theoretical ideas with practical research, bridging the gap between theory and practice. It also offers a foundation for analyzing the findings and deriving conclusions based on the study's theoretical foundations.

The interaction between Information and Communication Technologies (ICTs) and knowledge management in the Public Sector is at the center of this study's conceptual framework. The independent variable ICTs, in this study is further subdivided into four categories: ICT

processes, ICT human resources. These elements stand for the many ICT characteristics that are essential to the Public Sector's efficient knowledge management. The study's dependent variable is knowledge management. It can be further broken down into four (4) sub-variables: generation (producing, acquiring, synthesizing, fusing, and adapting); codification (capturing and representing); knowledge transfer and preservation; knowledge utilization. The crucial phases in knowledge management within an organization from creation and codification to transfer and preservation, are captured by these sub-variables.

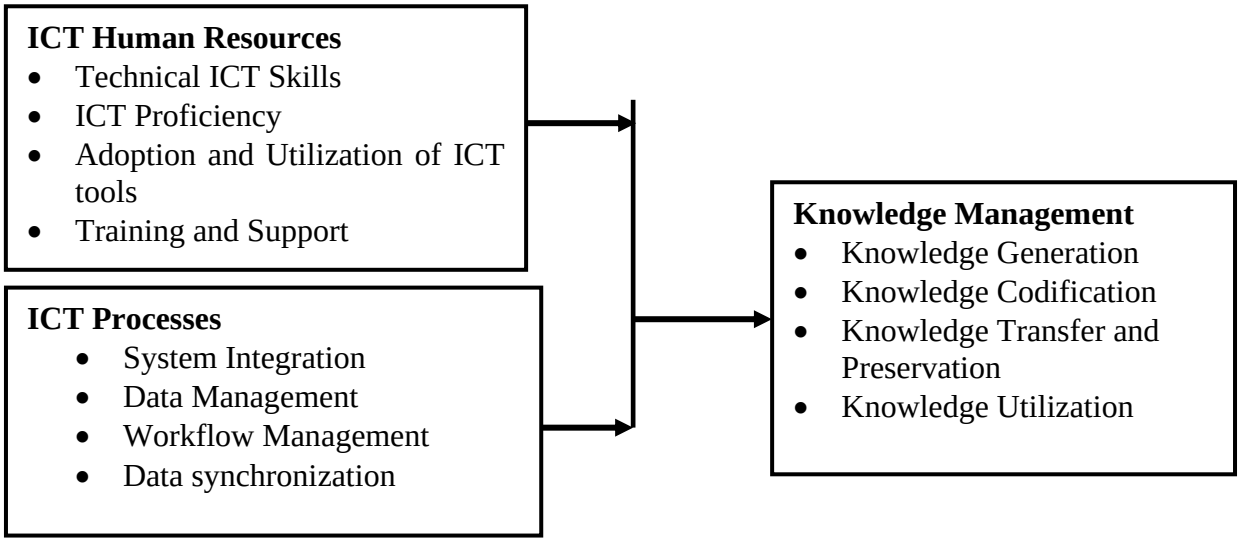

Figure 2.1: Conceptual Framework

ICT Human Resources

ICT human resources are those who oversee administering and utilizing the Public Sector's information and communication technologies. The operationalization of this variable focused on the four indicators: Technical ICT Skills (ICT employees), ICT Proficiency (employees ability to use ICT tools), ICT Adoption and Utilization of ICT tools (how quickly employees accept and use new technologies) and training and support (frequency and quality of training programmes and ICT helpdesk support).

ICT Processes

ICT processes refer to workflow management, system integrations, data management, data synchronization governing the implementation and use of ICT systems within the Public Sector to enable knowledge management. This variable has been measured using the indicators: system integration, data management practices, workflow automation and data synchronization. System Integration refers to the amount of integration between different platforms and databases inside the Ministry.

Knowledge Management

Knowledge management encompasses the methods by which knowledge is created, codified, transmitted, and preserved within the Public Sector in Kenya. The following indicators were used to operationalize this dependent variable: Knowledge Generation (meetings, workshops,

collaborative projects, and innovation forums) Knowledge Codification (capturing and storage formats), Knowledge Transfer and Preservation (transmitting and conserving knowledge) and Knowledge Utilization (document management platforms, repositories and databases).

Empirical Review

ICT Human Resources and Knowledge Management

Knowledge management (KM) systems in firms cannot function successfully without ICT human resources. The abilities, know-how, and proficiency of the staff members in charge of overseeing and employing ICT tools to support knowledge management procedures are included in these resources. Empirical research has focused a great deal on how well these human resources use ICT for knowledge management, and the results have repeatedly emphasized how important it is for qualified ICT professionals to successfully install and run KM systems. The significant influence that ICT skills have on knowledge management methods is demonstrated by a study conducted on public sector organizations in the United States, (Amayah, 2019). According to the survey, companies with highly qualified ICT staff had much better results when it came to KM system implementation. Advanced ICT proficiency improved an employee's ability to use knowledge management technologies like content management systems, databases, and collaborative platforms. These resources are necessary for gathering, conserving, and disseminating information inside the company. The study also underlined how important it is for staff members to pursue ongoing professional development and training to preserve and improve these skills and stay up to date on the newest technologies that support efficient knowledge management. According to the research, companies that make investments in training their ICT human resources are more equipped to use KM systems to further their objectives.

More proof of the significance of skilled ICT workers in knowledge management comes from studies done in international businesses by Alavi, *et al.,* (2018). According to their research, companies with strong ICT human resources had greater success integrating knowledge management (KM) systems with other organizational procedures, which made it easier for information to move smoothly between departments. Knowledge-sharing activities are essential to the efficacy of knowledge management (KM) systems, and their support is dependent on this integration. The survey also demonstrated that IT staff members who have a thorough awareness of knowledge management's organizational and technical facets do very well in their positions. These individuals not only possess the technical infrastructure management skills necessary to enable knowledge management (KM), but they also know how to connect these systems with the organization's strategic objectives, which improves the overall effect of KM on organizational performance.

Muriithi and Wachira (2021) examined the effect of ICT human resources on knowledge management within the framework of Kenyan government ministries. According to their research, ministries that have a larger percentage of employees with advanced ICT abilities are more likely to implement and use KM systems successfully. Higher degrees of knowledge production, archiving, and sharing were reported by these ministries, which enhanced decision-making and service provision. The study emphasized the value of focused training initiatives intended to improve employees' ICT proficiency across the board. Such workshops are essential for guaranteeing that staff members can fully utilize the KM tools at their disposal as well as familiarize themselves with them. This emphasis on capacity building is particularly crucial for public sector organizations, as the quality and effectiveness of public services can be greatly impacted by the efficient and effective management of knowledge.

But not every organization has the same human resources available for ICT. According to Ajayi, *et al.,* (2019), in their study of small and medium-sized firms (SMEs) in Nigeria revealed important ICT human resource-related obstacles that impede efficient knowledge management. The study found that a significant obstacle to the effective deployment of knowledge management (KM) systems was employees' lack of ICT capabilities. Due to a shortage of qualified ICT staff and inadequate training, many SMEs found it difficult to implement these systems. This lack of ICT human resources led to inadequate knowledge-sharing procedures and under-utilized KM technologies, which eventually hampered organizational performance. The results imply that businesses might not fully benefit from their knowledge management (KM) systems unless they make a deliberate effort to improve the ICT capabilities of their personnel.

These studies' issues highlight how important ICT human resources are to the success of knowledge management initiatives. For KM systems to be implemented and used effectively, skilled and competent ICT staff are necessary. But problems like inadequate training and a mismatch between ICT human resources and organizational objectives can seriously undermine these systems' efficacy. For example, in companies with technically competent ICT staff, a misalignment between the KM systems and the organization's overarching objectives may arise from a lack of knowledge of the strategic objectives of the company. The inefficiencies caused by this misalignment might lower the effectiveness of knowledge management initiatives.

Organizations need to make ongoing investments in training and development initiatives that improve the ICT proficiency of their personnel in order to mitigate against these challenges. These expenditures are necessary to guarantee that ICT workers are both technically competent and able to match KM systems to the strategic goals of the company. Organizations can also promote a culture that emphasizes knowledge management and rewards ongoing education and creativity. By doing this, companies can make sure that their human resources for information and communications technology are prepared to support efficient knowledge management and advance the long-term success of the company.

To sum up, the empirical literature unequivocally shows how important ICT human resources are to the accomplishment of knowledge management projects. For knowledge management (KM) systems to be implemented and run efficiently, skilled and knowledgeable ICT staff are essential. However, issues like inadequate training and a lack of connection with company objectives may make these methods less effective. To guarantee the success of their knowledge management endeavors and their congruence with their strategic goals, organizations ought to give precedence to the enhancement of their ICT human resources.

ICT Processes and Knowledge Management

ICT processes are the organized protocols, workflows, and standards that direct the use and deployment of ICT solutions inside an enterprise. To ensure that knowledge is successfully captured, stored, and distributed, these procedures are essential for the successful integration of knowledge management systems (KMS) into organizational activities. Empirical research has looked closely at the connection between ICT processes and knowledge management, and the results have repeatedly shown how crucial integrated and well-defined ICT processes are to improving organizational performance. The effect of ICT procedures on knowledge management in Taiwanese manufacturing companies was the subject of a thorough investigation, (Chen & Huang, 2019). According to their findings, companies that have well-defined ICT processes, such as automated systems and standardized workflows, are far more

successful in managing their knowledge assets. The automation of data entry and document management procedures particularly, was shown to decrease the time and effort needed to gather and store knowledge, which improved the organization's capacity to access and utilize knowledge during decision-making processes. This study emphasizes how important it is for ICT operations to streamline knowledge management tasks and guarantees that important information is available when needed.

Research on Spanish SMEs by López-Nicolás and Meroño-Cerdán, (2017) provides more evidence of the significance of ICT activities in promoting a culture of knowledge sharing. Their research showed that SMEs with well-established ICT procedures like frequent meetings for exchanging knowledge and the usage of collaborative platforms, were more likely to foster a culture that valued and promoted knowledge sharing. Consequently, this culture helped to increase organizational performance and enable the successful implementation of knowledge management systems. According to the study, ICT procedures not only help with the technical aspects of knowledge management but also have a significant impact on how an organization's culture fosters cooperation and knowledge sharing.

Not every firm has, however, been successful in utilizing ICT procedures. Several issues with ICT procedures in Nigerian financial institutions were noted by Adeola and Adebiyi (2018). Their research showed that ineffective knowledge management was frequently caused by unclear ICT procedures. For instance, information silos and effort duplication were caused by the lack of standard operating procedures for data entry, storage, and retrieval. The institutions' capacity to efficiently manage and disseminate knowledge was hampered by these inefficiencies, which eventually affected how well they performed overall. According to the report, businesses are likely to experience serious difficulties managing their knowledge assets in the absence of well-structured ICT processes, which could result in less-than-ideal results. Furthermore, in their research on South Asian public sector organizations, Ahmad, et al., (2021), emphasized the significance of matching ICT processes with organizational objectives. They discovered that a lack of alignment between ICT strategy and more general organizational objectives caused many public sector institutions to struggle with the implementation of ICT processes. This misalignment frequently led to disjointed knowledge management procedures, where ICT tools were either misused or implemented unevenly throughout the company. The study underlined that for ICT procedures to be really effective, they must be incorporated into the organization's entire strategic framework in order to assist the accomplishment of its overall goals and objectives.

ICT procedures are an essential part of effective knowledge management, as empirical literature has demonstrated. In addition to providing technological assistance for knowledge management, these procedures are essential for promoting a collaborative and information-sharing culture. Organizations must, however, handle the difficulties posed by ICT process deployment and make sure that these processes are in line with their strategic objectives if they are to fully reap the benefits of these systems.

RESEARCH METHODOLOGY

To examine phenomena as they occur in their natural environments without changing variables, this study employed descriptive research design. According to Mugenda and Mugenda (2008), descriptive research aims to gather specific information about the current state of affairs by concentrating on the beliefs, actions, perceptions, experiences, attitudes, and values of the participants. The target population for the study was the Public Sector Directorates in the Office of the Deputy Chief of Staff and in the Ministry of Public Service headquarters in Nairobi. The unit of observation was top, senior and middle level employees from the selected Technical

Directorates. The unit of analysis for the study was the eight Technical Directorates namely; Public Service Performance Management, Government Delivery Services (GDS) Human Resource Management Policy (HRM-P), Management Consultancy Services, Human Resource Development (HRD), Public Sector Reforms (PSR), Human Resource Information Services (HRIS), and the ICT directorate.

The target population for the study is the distribution of personnel among the Public Sector's Technical Directorates, as shown in the table below.

Table 1: Target Population

Technical Directorates	Total No. of Staff
Management Consultancy Directorate (MCS)	33
Public Sector Reforms (PSR)	30
Human Resource Management Policy (HRM-P)	35
Human Resource Development (HRD)	26
Public Service Performance	32
Government Delivery Services (GDS)	27
Human Resource Information Services	28
ICT Directorate	15
Total	**226**

Table 1 above highlights the distribution of the 226 employees across the selected Technical Directorates in the Office of the Deputy Chief of Staff and the Ministry of Public Service who form the target population for this research. In order to determine the appropriate sample size, the study assumed a 95% confidence interval and an error level of 0.05. The sample size (n) was calculated using the Yamane method, Yamane, (1967). The sample size, therefore, was 144 respondents. Stratified random sampling was utilized once purposive sampling has been used to identify the appropriate Directorates.

A directorate, job position, or other pertinent criterion were used to separate the population into discrete strata. Individual responders were then chosen within each stratum using simple random sampling. According to Saunders, et. al., (2019), this technique is especially good at minimizing sampling bias and guaranteeing that the sample is representative of the various subgroups within the target population. Purposive and stratified random sampling work together to guarantee that the sample is representative of a wide range of Public Sector employees and contains important personnel from important directorates

Table 2: Sample size

Technical Units/Strata	Total No. of Staff	% Strata	No of Respondents
Management Consultancy Services	33	15	22
Public Sector Reforms (PSR)	30	13	19
Human Resource Management - Policy (HRM-P)	35	15	22
Human Resource Development (HRD)	26	12	17
Public Service Performance (PSP)	32	14	20
Government Delivery Services (GDS)	27	12	17
Human Resource Information Services	28	12	17
ICT Directorate	15	7	10
Total	**226**	**100**	**144**

A questionnaire was used to collect data for this study. For data analysis, the study used the Statistical Package for Social Sciences (SPSS version 25). This is because of its capacity to

manage sizable datasets and conduct both descriptive and inferential analysis. SPSS is a reliable statistical program that is frequently utilized in research (Pallant, 2020). Additionally, it makes it possible to effectively visualize data, which facilitates the communication of findings through graphs, tables, and charts. This study was able to thoroughly examine the function of ICTs in knowledge management in the Public Sector using SPSS.

Descriptive analysis was used to analyze both open-ended and closed-ended questions. Measures like mean, median, mode, frequency distributions, and percentages are examples of descriptive statistics that aid in comprehending the general distribution of data (Field, 2018). The study employed inferential statistics to examine the correlations between the dependent variable and the independent variables. This study was guided by a multiple regression model to study the role of ICTs and knowledge management in the Public Sector

RESEARCH FINDINGS AND DISCUSSION

Questionnaires were distributed to all the selected respondents to gather data. Table 4.3 shows that 136 out of the 144 technical staff members in the Technical Directorates, who took part in the study returned questionnaires, yielding a 94.44% response rate. According to Mugenda & Mugenda (2016), a response rate of 50% or above is considered good for analysis and reporting, 60% is considered adequate, and 70% or higher is considered exceptional. The 94% response rate obtained in this survey was regarded as extraordinary since it exceeded 70% and was utilized for further reporting, analysis, and recommendations.

Descriptive Analysis

The study utilized a Likert Scale to evaluate the collected data, ensuring the accuracy and validity of the findings. The self-administered questionnaire was systematically divided into five sections, each designed to measure specific aspects of the study using a standardized Likert-type scale. Following the recommendation by Joshi, et. al. (2015), the scale was structured with five response categories: 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral), 4 (Agree), and 5 (Strongly Agree). The statements within the questionnaire were formulated in an affirmative manner to enhance clarity and consistency in responses. Each of the five sections contained six distinct items aimed at capturing relevant insights. The responses were then analyzed using statistical methods, specifically mean and standard deviation, to facilitate a comprehensive interpretation and generalization of the results. These statistical measures helped to summarize the central tendencies of the responses and provided a clear understanding of the participants' perspective.

ICT Human Resource and Knowledge Management

The study sought to analyze the impact of ICT human resource capacity on knowledge creation, storage, and retrieval within the Public Sector in Kenya. Effective knowledge management relies not only on infrastructure and technological tools but also on the competency of employees in utilizing these resources efficiently. The findings presented in Table 3 provide insights into the extent to which ICT human resource capacity influences knowledge management processes within the Ministry.

Table 3 Descriptive Statistics on ICT Human Resource on Knowledge Management

Statement	Mean	Std. Dev
The ICT staff possess the necessary skills and qualifications to manage and support ICT systems.	3.96	0.965
Regular training is provided to employees to enhance their skills in using ICT tools for knowledge management.	3.10	1.216
The Directorate offers sufficient support services (technical help desks) to resolve ICT-related issues.	3.71	1.130
The Directorate has effective training programs focused on improving ICT-related competencies.	3.16	1.042
The ICT team is responsive and provides timely support to staff using ICT tools for knowledge management.	3.83	1.079
Skilled ICT staff are adequately retained to ensure consistent support for ICT systems.	3.45	1.234

The findings presented in Table 3 indicate that respondents generally agreed that ICT staff in the Public Sector possess the necessary skills and qualifications to manage and support ICT systems (M=3.96, SD=0.965). This suggests that the Public Sector organizations have a competent workforce capable of effectively handling ICT-related tasks that facilitate knowledge management. Additionally, respondents acknowledged that regular training is provided to employees to enhance their skills in using ICT tools for knowledge management (M=3.103, SD=1.216), although the variation in responses suggests that training programs may need to be improved or be conducted frequently to meet evolving technological demands. Furthermore, respondents agreed that the Directorates offer sufficient support services, such as technical help desks, to resolve ICT-related issues (M=3.71, SD=1.130). This indicates that employees have access to the necessary assistance whenever they encounter challenges in using ICT systems. However, opinions were slightly more varied regarding the effectiveness of training programs aimed at improving ICT-related competencies (M=3.16, SD=1.042), implying that while training exists, it may require enhancement in terms of content relevance and delivery methods.

The responsiveness of the ICT team was also rated positively, with respondents agreeing that ICT personnel provide timely support to staff using ICT tools for knowledge management (M=3.83, SD=1.079). This suggests that employees receive adequate assistance in addressing technical issues, which helps in maintaining efficient knowledge-sharing processes. Additionally, respondents agreed that skilled ICT staff are adequately retained to ensure consistent support for ICT systems (M=3.45, SD=1.234). This finding highlights the importance of retaining knowledgeable personnel to sustain ICT infrastructure and processes that support knowledge management. These findings imply that the Public Sector has made significant efforts to build ICT human resource capacity, particularly in terms of staff qualifications, training, and technical support. The positive perception of ICT competency among staff members indicates a supportive environment for knowledge management. However, there is room for improvement in areas such as training effectiveness and ensuring uniform ICT competency across all employees. Strengthening these aspects would further enhance the Public Sector's ability to leverage ICT for efficient knowledge creation, storage, and retrieval.

Previous studies have supported these findings, demonstrating that ICT human resources cannot function successfully without knowledge management. For instance, Muriithi and Wachira (2021) examined the effect of ICT human resources on knowledge management within the framework of Kenyan government ministries. According to their research, ministries that have a larger percentage of employees with advanced ICT abilities are more likely to

successfully implement and use KM systems. Higher degrees of knowledge production, archiving, and sharing were reported by these ministries, which enhanced decision-making and service provision. The study emphasized the value of focused training initiatives intended to improve employees' ICT proficiency across board. Such workshops are essential for guaranteeing that staff members can fully utilize the KM tools at their disposal as well as familiarize themselves with them. This emphasis on capacity building is particularly crucial for public sector organizations, as the quality and effectiveness of public services can be greatly impacted by the efficient and effective management of knowledge. Additionally, according to Ajayi, *et al.,* (2019) study of small and medium-sized firms (SMEs) in Nigeria revealed important ICT human resource-related obstacles that impede efficient knowledge management. The study found that a significant obstacle to the effective deployment of knowledge management (KM) systems was employees' lack of ICT capabilities. Due to a shortage of qualified ICT staff and inadequate training, many SMEs found it difficult to implement these systems. This lack of ICT human resources led to inadequate knowledge-sharing procedures and under-utilized KM technologies, which eventually hampered organizational performance. The results imply that businesses might not fully benefit from their knowledge management (KM) systems unless they make a deliberate effort to improve the ICT capabilities of their personnel.

ICT Processes on Knowledge Management

Table 4 provides a summary of the findings related to the impact of ICT processes on the efficiency of knowledge management within the Public Sector in Kenya. Respondents were asked to assess various aspects of ICT processes, including how effectively they facilitate knowledge creation, storage, retrieval, and sharing. The responses reflect the Public Sector's efforts in integrating ICT systems to support efficient knowledge management practices.

Table 4 Descriptive Statistics on ICT Processes on Knowledge Management

Statement	Mean	Std. Dev
The Directorate's ICT systems are well-integrated and allow seamless data flow across directorates.	3.13	1.216
The Directorate follows best practices for data collection, organization, storage, and retrieval.	3.40	1.070
Automated ICT processes reduce manual effort and improve efficiency in knowledge management tasks.	3.85	1.088
The Directorate's workflows for managing ICT systems are standardized across all irectorates.	3.24	1.225
ICT processes ensure that information and knowledge are easily accessible.	3.71	1.039
Integration and automation of ICT systems have improved knowledge sharing within the Directorate	3.86	1.048

Respondents generally acknowledged that the Public Sector's ICT systems are well-integrated, enabling seamless data flow across different directorates (M=3.13, SD=1.216). This indicates that employees can efficiently access and exchange information, which promotes coordination and collaboration across various functional areas. A well-integrated ICT system ensures that data silos are minimized, allowing for smoother interactions and knowledge-sharing among teams. Additionally, the study revealed that the Public Sector adheres to best practices in data collection, organization, storage, and retrieval (M=3.40, SD=1.070). This structured approach to data management ensures that crucial knowledge resources are systematically documented, stored securely, and remain easily accessible for future reference. The ability to retrieve and utilize stored knowledge efficiently helps in decision-making processes and improves institutional memory.

Automation of ICT processes emerged as a critical factor in improving efficiency, as respondents agreed that automated systems reduce manual workload and streamline knowledge management tasks (M=3.85, SD=1.088). By minimizing human intervention in repetitive processes, automation enhances accuracy, reduces errors, and accelerates the dissemination of information. Standardizing ICT workflows across all directorates (M=3.24, SD=1.225) further contributes to operational efficiency by ensuring that knowledge management processes follow a consistent approach throughout the Ministry. This uniformity prevents inconsistencies, facilitates better collaboration, and enhances the reliability of shared information.

Furthermore, respondents recognized that ICT processes ensure that information and knowledge are easily accessible when needed. The Public sector's commitment to supporting technology-driven initiatives is evident in its allocation of financial and human resources to maintain and enhance ICT systems (M=3.71, SD=1.039). This investment is crucial in sustaining technological advancements and ensuring that employees have the necessary tools and expertise to manage and utilize knowledge effectively. Lastly, the integration and automation of ICT systems have significantly improved knowledge sharing within the Public Sector (M=3.86, SD=1.048). This improvement fosters a culture of collaboration and information exchange, leading to more informed decision-making and increased efficiency in service delivery. The findings underscore the importance of well-structured ICT processes in supporting knowledge management efforts. However, for further optimization, the Public Sector could focus on enhancing system interoperability, providing continuous staff training on emerging ICT tools, and increasing investments in innovative technologies to further strengthen knowledge-sharing capabilities. The findings suggest a consensus among respondents regarding the significance of ICT processes on knowledge management support in the Public Sector. Specifically, the results indicate that organizations that have well-defined ICT processes, such as automated systems and standardized workflows, are far more successful in managing their knowledge assets. The automation of data entry and document management procedures particularly, was shown to decrease the time and effort needed to gather and store knowledge, which improved the organization's capacity to access and utilize knowledge during decision-making processes (Chen and Huang, 2019). According to their findings, the findings resonate with prior research on significance of ICT activities in promoting a culture of knowledge by López-Nicolás and Meroño-Cerdán (2017). Their research showed that SMEs with well-established ICT procedures like frequent meetings for exchanging knowledge and the usage of collaborative platforms, were more likely to foster a culture that valued and promoted knowledge sharing.

Ahmad, *et al.,* (2021) emphasized the significance of matching ICT processes with organizational objectives. They discovered that a lack of alignment between ICT strategy and more general organizational objectives caused many public sector institutions to struggle with the implementation of ICT processes. This misalignment frequently led to disjointed knowledge management procedures, where ICT tools were either misused or implemented unevenly throughout the company. The study underlined that in order for ICT procedures to be effective, they must be incorporated into the organization's entire strategic framework in order to assist the accomplishment of its overall goals and objectives. In contrast study by Adeola and Adebiyi (2018) not every firm has, however, been successful in utilizing ICT procedures. Several issues with ICT procedures in Nigerian financial institutions showed that ineffective knowledge management was frequently caused by unclear ICT procedures. The institutions' capacity to efficiently manage and disseminate knowledge was hampered by these inefficiencies, which eventually affected how well they performed overall. The findings highlighted the critical role played by ICT processes in promoting and fostering knowledge management in the Public Sector. By incorporating the ICT procedures, knowledge management would ultimately be improved.

Knowledge Management

Evaluation of the current knowledge management in the Public Sector revealed the level of agreement attached to each of statements of the current knowledge management environment. The responses captured from the respondents when asked to indicate the extent to which they agreed with statements relating to knowledge management processes in the Public Service in Kenya is as summarized in Table 5.

Table 5: Descriptive Statistics on Knowledge Management

Statement	Mean	Std. Dev
The Directorate frequently organizes knowledge-sharing activities such as workshops and projects.	3.13	1.258
Knowledge is effectively captured, stored, and codified in accessible formats across the Ministry.	3.14	1.130
The Directorate has effective mechanisms for knowledge transfer between directorates.	3.18	1.141
The Directorate's knowledge management processes ensure that knowledge is preserved for future use.	3.33	1.091
The Directorate effectively utilizes stored knowledge to support decision-making and improve service delivery.	3.42	1.000
ICT tools have significantly enhanced the Directorate's overall knowledge management capabilities.	3.69	1.029

The findings presented in Table 5 indicate that respondents generally agreed on the effectiveness of the Public Sector's knowledge management processes in facilitating knowledge sharing, storage, and utilization. The responses suggest that the Public Sector frequently organizes knowledge-sharing activities such as workshops, projects, and collaborative forums, which play a crucial role in fostering a culture of continuous learning and information exchange among employees (M=3.13, SD=1.258). These activities provide structured opportunities for staff to share insights, best practices, and institutional knowledge, contributing to improved decision-making and efficiency. Respondents agreed that knowledge is effectively captured, stored, and codified in accessible formats across the Public Service (M=3.14, SD=1.130). This implies that the organization has established systematic approaches to documentation and preserves critical information, ensuring that employees can retrieve and utilize knowledge resources as needed. However, the moderate mean score suggests that there may still be areas for improvement in optimizing accessibility and usability.

Additionally, the study also found that the Public Sector has implemented effective mechanisms for knowledge transfer between directorates, facilitating the seamless flow of information across different units (M=3.18, SD=1.141). This advocates that structured processes exist to prevent knowledge silos and ensure that employees can benefit from shared expertise and institutional experience. Strengthening these mechanisms could further enhance interdepartmental collaboration and efficiency. Furthermore, the findings show that respondents believe the Public Sector's knowledge management processes are designed to preserve knowledge for future use (M=3.33, SD=1.091). This shows the importance of sustainability in knowledge retention, ensuring that valuable insights and institutional memory are not lost due to staff turnover or operational changes. Respondents also indicated that the Public Sector effectively utilizes stored knowledge to support decision-making and improve service delivery (M=3.42, SD=1.000). This proposes that knowledge management efforts contribute to evidence-based policymaking, operational efficiency, and improved public service outcomes. Ensuring that knowledge repositories are user-friendly and that they are continuously updated could further enhance their impact.

Lastly, the study findings indicate that ICT tools have played a significant role in enhancing the Public Sector's overall knowledge management capabilities (M=3.69, SD=1.029). This suggests that digital platforms, databases, and other technological solutions have streamlined knowledge-sharing processes, making information more accessible and usable for employees. However, continuous investment in technology upgrades and staff training could further optimize the effectiveness of ICT-enabled knowledge management. The results from this study show that employees' awareness, management support, employee training, policy, incentives and proper defined channels on knowledge management aided the organization in attaining institutional competitiveness, efficiency and adaptability resulting in sustainability. This agrees with the study conducted by Omona et al. (2010) which indicates supporting the collective expertise of an institution's employees and partners is an important source of competitive advantage and a key to her success.

Correlation Analysis

Pearson moment correlation analysis was employed to find the correlation coefficient. The study tested whether interdependency existed between the independent variables and whether there was any relationship between the dependent variable and independent variables and the direction of their relationship. The association was considered to be small if $\pm 0.1 < r < \pm 0.29$; medium if $\pm 0.3 < r < \pm 0.49$; and strong if $r > \pm 0.5$. The correlation findings were as presented in Table 6.

Table 6: Correlation Analyses

		ICT Human Resources	ICT Processes	Knowledge Management
ICT Human resources	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	136		
ICT processes	Pearson Correlation	.752**	1	
	Sig. (2-tailed)	.000		
	N	136	136	
Knowledge Management	Pearson Correlation	.603**	.646**	1
	Sig. (2-tailed)	.000	.000	
	N	136	136	136

ICT human resources and knowledge management in the Public Sector in Kenya are likewise shown to have a good correlation (r=0.603). Additionally, the significant association between the two variables was indicated by the p-value (0.000), which was smaller than the chosen level of significance (0.05). The results also show the relationship (r=0.646) between knowledge management in the Public Sector in Kenya and the influence of ICT processes. Because the p-value (0.000) was below the chosen level of significance, the association was also regarded as significant.

Regression Analysis

Multiple Linear regression model was employed to establish the influence among predictor variables and explain magnitude and course of relationship amongst the variables of the study utilizing coefficient of determination and the level of significance. The beta coefficients were used to illustrate the association between the variables using a model of the structure: $\mathbf{Y_i = \beta_0+\beta_1X_1+\beta_2X_2+\varepsilon}$. Where; Y= Knowledge Management; β_0 = Constant (Coefficient of intercept); X_1 = ICT Human Resource; X_2 = ICT Processes.

Table 7:Beta Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	4.378	1.343		1.027	.306
	ICT Human resources	.730	.103	-.028	3.287	.001
	ICT Processes	.594	.091	.185	2.140	.034

a. Dependent Variable: Knowledge Management

The regression equation is shown as:

$Y = 4.378 + 0.730\ X_1 + 0.594\ X_2$

According to the equation, ICT human resources, ICT processes have a substantial impact on knowledge management in the Public Sector**.** Results from the findings show that human resources, ICT processes influence on knowledge management in the Public Sector remained constant at 4.378. The study was keen to determine the influence of ICT human resources on knowledge management in the Public Sector. The results were that (β=.730, p=0.001<0.05), which infers that it had significant effect in explaining knowledge management in the Public Sector. Given that the p-value (0.001) is less than the chosen level of significance (0.05), the influence is significant. This suggests that the knowledge management in the Public Sector was positively and significantly impacted by ICT human resources. The results further showed that increase in ICT human resources would result to improvement in knowledge management in the Public Service by 0.730 units as ICT human resources are added.

Additionally, the results demonstrated that ICT processes were statistically significant in explaining knowledge management in the Public Sector as indicated by (β = .594, p = 0.034>0.005). Given that the p-value (0.005) is smaller than the chosen level of significance (0.05), the influence is significant. This suggests that knowledge management in the Public Sector is favorably and considerably influenced by the ICT processes. Findings showed that knowledge management in the Public Sector performed better by 0. 594 units because of strengthening ICT processes.

The t-values revealed that ICT human resources (t=3.287), and ICT processes (t=2.140) was the greatest influencer of knowledge management. This clearly indicates that besides investment in Capacity building for ICT human resources and ICT processes, greatly determines the quality and quantity of knowledge management and the effectiveness of the knowledge management processes.

Conclusions

The study has established that ICT human resources play a critical role in facilitating knowledge creation, storage, and dissemination, underscoring the importance of continuous capacity building in relevant programmes that support knowledge management technologies in use and investment in digital skills. The training should consider the ICT technical employees and other employees who are the users of the knowledge management systems. This ensured enhanced efficiencies in knowledge management system use and retention of ICT-skilled staff.

Similarly, ICT processes are shown to have a substantial impact, highlighting the necessity for well-structured digital workflows and systematic knowledge-sharing mechanisms to enhance organizational efficiency. This calls for alignment of the organization's strategies alongside the ICT and knowledge management strategies to avoid conflict and ensure a smooth flow in knowledge management.

Recommendations

Since employees play a crucial role in ICT-driven knowledge management, continuous training and capacity-building in relevant ICT programmes should be implemented frequently. Digital literacy workshops, specialized ICT training and mentorship programs should be introduced to equip staff with the necessary skills to utilize ICTs effectively. Furthermore, incentives and career development opportunities should be provided to encourage employees to embrace technology and innovation in their daily tasks and to retain them.

The Public Sector should streamline and automate knowledge management processes to enhance efficiency and accuracy. Implementing standardized data entry procedures, automated workflows, and integrated knowledge-sharing platforms improved collaboration and institutional memory. Clear policies and guidelines on digital documentation and data governance should be established to ensure consistency and compliance across directorates.

Areas for Further Research

From the findings of this study, in the model summary on Table 4.11, the R^2 value was determined to be 0.692 (69.2%) can be attributed to the independent variables, meaning that changes to the ICT human resources, ICT processes can account for 69.2% of the variance in knowledge management at the Public Sector. The remaining 30.8% can be explained by other factors that were not included in the study but have an impact on knowledge management in the Public Sector. This can form the basis for further research.

REFERENCES

Adeola, O., & Adebiyi, S. O. (2018). ICT processes and knowledge management in Nigerian financial institutions: Challenges and prospects. *Journal of Information and Knowledge Management*, 17(3), 185-204.

Ahmad, M., Zafar, S., & Khan, M. N. (2021). The role of ICT processes in knowledge management: Challenges and opportunities in South Asian public sector organizations. *Public Organization Review*, 21(2), 315-334.

Ajayi, B., Sanni, M., & Akinola, O. (2019). The impact of ICT skills on knowledge management practices in Nigerian SMEs. *Journal of Information and Knowledge Management*, 18(2), 195-210.

Alavi, M., Kayworth, T. R., & Leidner, D. E. (2018). An empirical examination of the influence of ICT human resources on knowledge management effectiveness in multinational corporations. *Journal of Management Information Systems*, 35(4), 103–135.

Amayah, A. T. (2019). Determinants of ICT skills and their impact on knowledge management in public sector organizations: Evidence from the United States. *Public Administration Review*, 79(4), 502–514.

Chen, H. H., & Huang, M. F. (2019). The impact of ICT processes on knowledge management effectiveness in Taiwanese manufacturing firms. *Industrial Management & Data Systems*, 119(4), 834–849.

Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2019). Re-examining the unified theory of acceptance and use of technology (UTAUT): Towards a revised theoretical model. *Information Systems Frontiers*, 21(3), 719–734.

Josephat, J. M., & Guyo, D. W. (2017). Knowledge Management practices and performance of national Government Ministries in Kenya. *Strategic Journal of Business & Change Management*, 4(4), 456–474.

Jumba, H., Bundi, D., & John, J. (2020). Use of ICTs in Knowledge Management for Enhanced Institutional Sustainability. *Regional Journal of Information and Knowledge Management*, 5(1).

Lewis, J., Schneegans, S., & Straza, T. (2021). *UNESCO Science Report: The race against time for smarter development*. UNESCO Publishing.

López-Nicolás, C., & Meroño-Cerdán, A. L. (2017). How ICT processes support knowledge management and organizational performance in Spanish SMEs. *Journal of Knowledge Management*, 21(3), 625–644.

Mumford, E. (2006). The story of socio-technical design: Reflections on its successes, failures and potential. *Information Systems Journal*, 16(4), 317–342.

Muriithi, G. K., & Wachira, J. M. (2021). ICT human resources and knowledge management in Kenyan government ministries: A case study. *Journal of Public Administration and Governance*, 11(1), 34–48.

Ndiege, J. R. A., & Wamuyu, P. K. (2019). Knowledge management practices and systems in county governments in developing countries: Perspectives from selected counties in Kenya. *VINE Journal of Information and Knowledge Management Systems*, 49(3), 420–439.

State Department for Economic Planning. (2023). Baseline Survey on Knowledge Management (KM) Awareness and Practices in the Public Service.

Trist, E. L., & Bamforth, K. W. (1951). Some social and psychological consequences of the longwall method of coal-getting. *Human Relations*, 4(1), 3–38.

Van Dijck, J., Poell, T., & de Waal, M. (2018). *The platform society: Public values in a connective world*. Oxford University Press.

Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. *Decision Sciences*, 39(2), 273–315.

World Bank. (2019). *Rwanda Economic Update: Lighting Rwanda*. Washington, DC: World Bank Group.

Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). Harper and Row.