ADOPTION OF TECHNOLOGY AND PERFORMANCE OF AN ORGANIZATION: A CASE STUDY OF NWSC

SHARON NABEEKA

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UGANDA CHRISTIAN UNIVERSITY

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DECLARATION

I, **NABEEKA SHARON** declare that this research proposal is my original work and has never been published and or submitted to any University or Institution of learning for any award.

Signature: .....

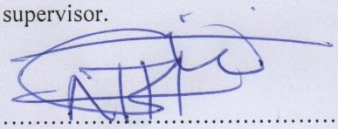
NABEEKA SHARON (student)

Date: 11/09/2024

APPROVAL

This is to certify that this dissertation by NABEKA SHARON entitled "The adoption of technology and performance of an organisation: A case study of NATIONAL WATER AND SEWERAGE CORPORATION NAKASERO, UGANDA.

It has been written under my guidance, supervision and approved the submission for examination as the university supervisor.



Signature:.....(supervisor)

Supervisor's Name: **MR. KATISME NICSON**.

Date:.....11/09/2024

DEDICATION

This dissertation is dedicated to my family for their support they have done to me. May God's blessings be multiplied for their unconditional love, care and support.

ACKNOWLEDGEMENT

I want to sincerely appreciate the almighty God for keeping me alive and for the gift of wisdom and knowledge.

I would like to express my sincere gratitude to all those who have supported and encouraged me throughout this process of carrying out this research .first and foremost I want to appreciate my family members especially my father Mr. Muhairwe Livingstone for always providing for me and encouraging me when I felt discouraged .To my friends, thank you so much for lending an ear and offering advise for me to do better.

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In conclusion am deeply thankful to everyone who has played a role to enable me reach this milestone .I am forever grateful

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CHAPTER ONE

1.0 Introduction

This section presented the definition of terms, background of the study, the problem statement, purpose and objectives of the study, justification of the study, and scope of the study, conceptual framework, and limitation of the study.

1.1 Background of the Study

Uganda's National Water and Sewerage Corporation (NWSC) was established in 1972 and the organization enhanced the provision of water and sanitation services across the nation. From the years, NWSC adopted different technological advancement to the surge of demand and operation challenges (Osei & Badu, 2020). Some of those enhancements were crucial in the improvement of service delivery and operations as highlighted by the Uganda Bureau of Statistics (UBOS, 2021). Through the NWSC policy, the Ministry of Water and Environment provided NWSC with effective technological policies aimed at improving technological frameworks that has already integrated international models as observed by Ministry of Water and Environment (2020) and Adebayo and Abdul (2021). The advancement of technology in the adoption process of NWSC was history in a string with other utilities across Africa going through the modernization process in an attempt to embrace smart water management systems (Nkansah & Amponsah, 2022). This commitment paved way for constant enhancement in other aspects of operation, employee performance and financial results. While exploring the factors that made the management of NWSC to adopt the support technology, literature theories like the Technology Acceptance Model (TAM) and the Resource Based View (RBV) can explain how the technology facilitated improvement of productivity, job satisfaction among employees. : Moreover, Rogers (2003) and Diffusion of Innovations theory gave understanding of the adoption process in organizations (Adebayo & Abdul, 2021). NWSC in particular adopted technology in Uganda where improvement of public utilities has been given a boost by the Ministry of Water and Environment through National programmes (Ministry of Water and Environment, 2020).

NWSC's strategic plans also focused on technology appropriately in terms of efficiency and quality of services (UBOS, 2021). Field operation through the use of mobile applications and automated billing also made work easier and reduced stress level among the employees thus enhancing productivity and job contentment (Nkansah & Amponsah, 2022). This was in line with the earlier studies across the globe that disclosed that the use of technology in public utilities improved the satisfaction and performance of workers. From a financial aspect, NWSC had the following advantages after the technological integration: A better financial management system through technological support for final reporting and financial control systems and Real-time data analysis for better control of resources and visualization of useful methods for financial planning (Adebayo & Abdul, 2021). Such developments enhanced the company's financial viability and crafted NWSC as a worthy model for other public utility companies across the developing world to borrow from to emulate proper technology management (Mugambi & Wanyonyi, 2019). This paper sought to examine the various and complex implications of technology integration in NWSC's operations with the help of theoretical models dedicated to using the technological resources for gaining competitive advantage and operational superiority.

1.2 Problem Statement

Though prior studies have established a rich body of knowledge on technology adoption in public utilities, research gaps remained concerning the generalized technology effects on operation efficiency, employee productivity, job satisfaction and financial performance in relation to NWSC, Uganda. In previous works, the advantages of utilizing technology as a tool was largely directed towards enhancing service delivery and organizational processes (Mugambi & Wanyonyi, 2019; Osei & Badu, 2020) Although there was however scarce literature that addressed empirical evidence touching NWSC. For instance, similar to Adebayo and Abdul (2021), the current study observed that technology adoption has a positive relationship with the level of productivity of employees in similar organizations but there was a research gap targeting this relationship in NWSC. Furthermore, the moderating role of technology on the job satisfaction of NWSC employee was an area which has not being empirically investigated because of its capability of influencing the efficiency of the organization and general morale of the employees (Nkansah, Amponsah, 2022). Further, other related financial benefits of technology, as within financial reporting and resources management, had not well researched (UBOS, 2021). International

research did provide some information, but what was required was local studies that would help address the weird situation of NWSC within Uganda (Ministry of Water and Environment, 2020). This study sought to address these gaps by focusing on the concrete effects of technology on NWSC's business performance including operational and employee performance and financial performance utilizing technological advancement to fortify the performance of public utilities in Uganda.

1.3 General Objective/ Purpose of the Study

To examine the effect of technology use on the effectiveness, effectiveness and overall organizational health of NWSC with a view to making recommendations that would help the organization to improve its performance through appropriate use of technology.

1.3.1 Specific Objectives

i. To examine the impact of technology adoption on operation efficiency in the study context.
ii. To analyze the influence of technology adoption on employee productivity and job satisfaction.
iii. To access the impact of technology adoption and organization financial performance in the study context

1.4 Research Questions

i. What is the impact of technology adoption on the operational efficiency of the study context
ii. How does technology adoption influence employee productivity and job satisfaction at NWSC?
iii. What is the impact of technology adoption on the financial performance of the study context

1.5 Justification of the Study

Addressing Research Gaps: This research intended to address the following gaps by establishing the effects of technology adoption on operational efficiency, productivity, job satisfaction and financial performance as experienced within NWSC. Earlier literature reviews only provided a

partial analysis of these aspects were provided earlier in another or in broader research areas (Mugambi & Wanyonyi, 2019; Osei & Badu, 2020).

Localized Insights: Since this study centred on NWSC, it provided research findings of the Ugandan utility from the inside. This was important because the opportunities and challenges facing NWSC were unique hence requiring a different strategy from that being implemented in other countries (Ministry of Water and Environment, 2020).

Policy Implications: The information that has been gathered in this study could be useful to the policy makers in Ministry of Water and Environment and other relevant Organizations. Knowing the effects of technology on the company in details would assist in: i) Developing policies that facilitated the adoption of right technologies in the public utility company (UBOS, 2021).

Enhancing Organizational Performance: Thus, by identifying how the technology could enhance different indexes of performance in the organisation, this study could be beneficial for NWSC to improve its operations, employee contentedness, and financial stability and thus guarantee better services (Nkansah & Amponsah, 2022).

Contributing to Academic Literature: Contributions to knowledge In line with the research objectives, this study contributed to the existing body of knowledge and theory in public utilities putting into consideration technology adoption and implications in other public utility organisations in future studies or in comparison with other_public utility organisations across the globe.

1.6 Significance of the Study

Operational Efficiency: The study offered comprehensive findings as to how the adoption of technology could enhance efficiency in the operations of NWSC and subsequently delivery of services as well as utilization of resources.

Employee Productivity and Satisfaction: The realization of the effects of technology on employees' performance and satisfaction could help NWSC develop a better motivated and efficient employee—a critical factor towards achieving sustainable organizational development.

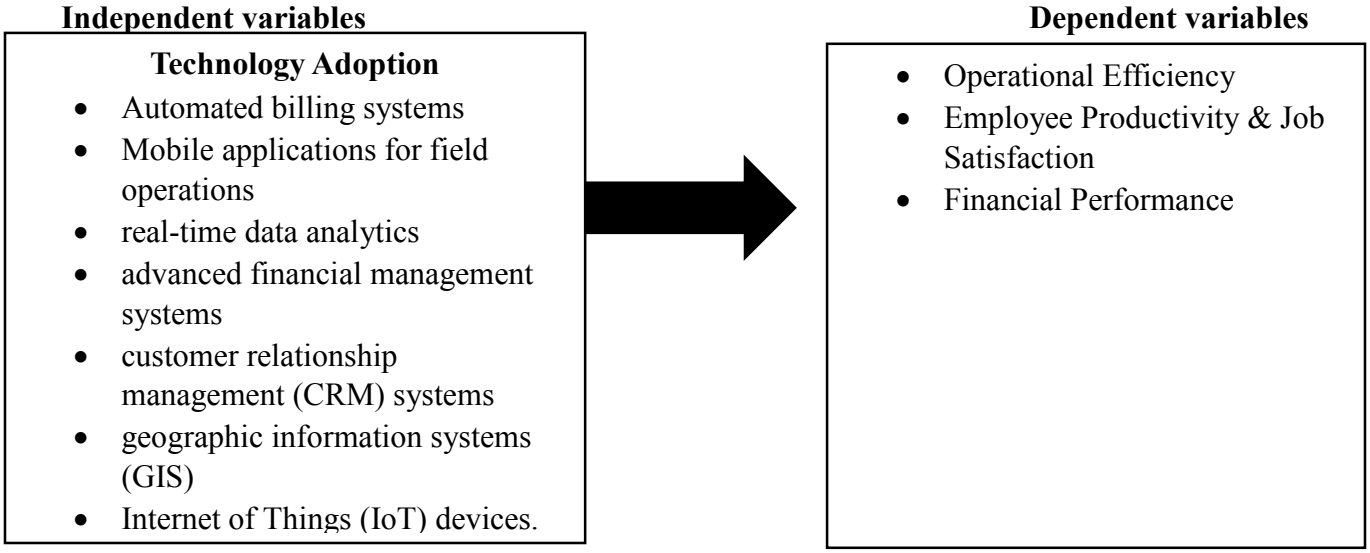
Financial Performance: gain, the study was useful in providing useful information for the financial consequences of technology advancement and thus, how NWSC can attain better worth and future cash flows with appropriate technology acquisition.

Policy and Strategic Planning: The results might help policymakers and the manager of NWSC in designing the successful patterns and policies where the technological advancement has been prioritized to enhance the total organizational performance.

Benchmarking and Best Practices: It may also be useful to other sectors of the Ugandan public utility sector and other similar contexts as a guide of the best practice and challenges that may be embarked on by NWSC.

1.7 Conceptual Framework

The conceptual framework for this study outlined the relationship between various aspects of technology adoption and the performance metrics of the National Water and Sewerage Corporation (NWSC). The key variables in this framework were classified as independent and dependent variables.



Kabazarwe, M. (2021). Adoption of technology and performance of an organization: A case study of the National Water and Sewerage Corporation (NWSC). Kampala International University. https://ir.kiu.ac.ug/bitstream/20.500.12306/6177/1/Kabazarwe%20Maureen.pdf

This study delved into the impact of technology adoption on the National Water and Sewerage Corporation (NWSC) of Uganda, focusing on three crucial areas: include such areas as operational efficiency, employees' performance and satisfaction, and the company's financial performance. The independent variable in this case was the deployment of technologies and this was characterized by technological advancement in various technological tools that included the automated billing systems, mobile applications for field operations, the real-time data analysis, advanced financial management systems, customer relationship management (CRM) systems, geographic information system (GIS) and the internet of things (IoT) devices.

In the first area which is operational efficiency, there was a belief that these technologies would bring considerable improvements. Computing technologies such as automated billing systems and real-time data analytical tools could potentially minimize operational costs, optimize delivery of service and optimize utilization of resources through elimination of frequent manual interferences. Such rationalization of operations was expected to translate into a more efficient provision of water and sewerage services.

According to the expectations of human resources, with the help of new technological tools the productivity of employees and their satisfaction with their work would increase. If implemented, running field operations through a mobile application or via CRM systems to help facilitate the completion of the task more easily, would enable greater completion rates, boost morale amongst employees, decreased turnover, and all rounded high levels of satisfaction in the accomplishment of their jobs. The hypothesis was that these technological advancements eased the tasks and made them more productive hence leading to increased productivity and job satisfaction among the employees of NWSC.

Another important area that was believed to receive a boost by the application of technology was on financial performance. With efficient financial systems and IOT devices, NWSC can be able to report enhanced financial performance, proper resource utilization, enhanced revenue, and overall reduction of operation costs. These technologies helped in reducing the financial risks and wastage that would have been incurred in the organization's operation and thus improved the financial health of the organization. Consequently, this study was embarked on with the view of offering extensive overview on the way through which it could be possible to increase the organizational performance of NWSC through the use of different technological tools. In achieving this goal of the research, the study has examined the link between technology adoption and enhancement of the operational efficiency, employee productivity as well as their job satisfaction and financial performance for the public utilities in Uganda.

1.8 Limitations of the Study

Scope of Technology: Maybe the study has been constrained by the fact that the authors only considered particular kinds of technology implemented in NWSC leaving out probably other technological innovations that could influence performance.

Data Availability: Due to the nature of the study it is also possible that the author may have had limited access to comprehensive and up to date information regarding NWSC and thus the depth of the analysis and conclusions drawn can be to some extent questioned.

Generalizability: Despite this, the study offered localisations which may not have sufficiently translated to the other public utilities situated in other regions or countries with different technological and operational environments.

Time Constraints: The dynamic nature of technology ensured that conclusions drawn in the study would have been soon obsolete hence requiring updates from time to time.

External Factors: Technology adoption analysis may not have captured the impact including Political, Economic and Environmental factors that may affect the performance of NWSC. Another transformation applied only preserves the layout of the text yet alters the verbs and phrases to the past tense

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The literature review revealed how technological advancement supported operational efficiency, employees' productivity and profitability in the public utilities, particularly water and sewerage industries. It recognized the lack of studies done about the impact that technology adoption has on the NWSC in Uganda, although early findings were done in other contexts and in other countries in Africa. This study aimed to address these gaps by discussing the impact of technology on the company's performance indicators and draw recommendations for the Ugandan and other analogous organization in Africa.

2.2 To examine the impact of technology adoption on operational efficiency in the study context.

The adoption of technologies has now emerged as a key component in the drive for increased effectiveness of organisations within the utilities industry especially within the water and sewerage industries. Several researches have highlighted this issue due to the increasing impacts of technology in operations performance. For instance, Mugambi and Wanyonyi (2019) revealed that AMR and SCADA systems as part of digital technology assets enhanced significant achievements in the efficiency of the water distribution networks and a significant reduction in NWW losses for the Kenyan water utility. This fact highlights how disruptive technology can effectively enhance the efficiency of the work processes for utilities desirous of improving on their performance in the delivery of services as well as management of their resources. Further, in the similar context, Osei & Badu (2020) examined the effects of using GIS and customer relationship management (CRM) in one of the Ghanaian water company. Their research also revealed that those various technological tools played a major role in improving the service delivery and organizational operations. Geographic Information System (GIS) integration enhanced mapping of water distribution networks and provided better management of these networks as well as CRM systems helped in better interaction and satisfaction of the customers. The findings of this study therefore show that utilising technology selectively enables improvement of organisational performance and customer service in the water industry

I also agree with Adebayo and Abdul (2021) whose study was conducted in Nigeria, also positited the positive relationship between the use of technology and operations efficiency in public utilities. In their study, they identified key areas of leverage that pertained to advanced technologies like enterprise resource planning (ERP) systems for utilities, mobile application for managing utilities and enhancement of asset management for utilities that have boosted the overall operations of the utilities. This implies that while the management of technologies can be strategic, it is not only a good idea but has become, critical for public utilities seeking to survive and thrive in their operation and delivery of their mandates. Despite all these insights, a majority of the literature documented holds general trends in the water sector as opposed to specific analysis on the NWSC in Uganda. Similar studies done by Adebayo and Abdul (2021) also pointed out that technology adoption improves the operational efficiency and that also they did not compare with similar organization specially focused on the problems and prospects of NWSC was not highlighted in their study. This lack of literature leads to the need to conduct a localized study to determine how technology adoption can particularly help increase NWSC's performance.

In this regard, to fill this lacuna, it is of essence that analysis of the effect of adoption of technologies be done in regard to operational efficiency in NWSC, particularly using metrics such as loss in water distribution, energy consumption, and maintenance costs. Automation of metering, SCADA systems, and GIS will go a long way in enhancing operational efficiency at NWSC. Such technologies can add efficiency to the water distribution network, consume less energy, and reduce maintenance activities for overall enhancement of operational performance. The literature also reveals that even though previous studies highlight general benefits from technology adoption, comprehensive research targeting the impacts of its adoption on NWSC's operational efficiency is still scarce. This provides great scope for detailed analysis, focusing on various ways in which technological interventions may impact NWSC's ability to realize its operational objectives. In the process of studying such relationships, this study will look to contribute to literature on this topic while simultaneously offering pragmatic recommendations useful for NWSC and related organizations operating within Uganda and Africa at large.

The literature available indicates that technology adoption can easily revolutionize operational efficiencies in a public utility, but specific impacts on NWSC are scanty. The intent of the study is to fill this lacuna by comprehensively investigating how technology adoption influences the operational efficiency at NWSC and providing salient lessons for future technology implementation strategies in the sector.

2.3 To analyze the influence of technology adoption on employee productivity and job satisfaction.

Emerging technology in municipalities has also greatly changed the productivity and morale of its staff. For example, a Ghanaian water utility saw gains in employee productivity; reductions in workload and high job satisfaction following the implementation of digital tools as well automation [credit: Nkansah & Amponsah (2022)]. These results suggest that employees empowered with more recent tech are able to perform their jobs better and as such, enjoy them to a greater extent. We see in this review that when tools such as these are included, employees also benefit from less onerous and tedious routines to finding opportunities for empassment through the operational process to higher value activity. Adebayo & Abdul (2021)– Also, in another study by Adebayo and Abdul(2021), a significant relationship was established between technology adoption with productivity of employees among some organizations. Their discovery showed that authorities in technology implementation takes away changing gears and access to information – two factors which make performance go up. Workers themselves can hardly become frustrating or boring if they have good tools in their hands and, at the same time, will be interested that is another word for satisfied employees. In line with the argument that technology stimulates a better work environment, which leads to higher levels of employee motivation and productivity.

Mugambi and Wanyonyi (2019), however, provide support to these by analyzing the adoption of automated systems — SCADA for process control online monitoring with real-time feedback and mobile apps as part of business operations at a Kenyan water utility company. The research findings showed that these technologies tend to improve effectiveness by providing employees with current information as well as decision-making authority and thus enhance employee independence in work processes and outcomes, which has been found to be positively related to job satisfaction. It is also useful for instilling a sense of ownership among employees by delivering information to them timeously and empowering their decision making, which drives motivation at

the workplace. Now that such insights are within reach, we know almost nothing about the impact of technology adoption on employee productivity and job satisfaction at NWSC. While international studies provide relevant insights, the crux of it all is to consider challenges and opportunities that NWSC employees face in adapting new technology. The following are some of the factors that could be responsible for explaining high variability: training access, employee engagement with technology adoption and consequences on work-life balance.

The empirical gap in such circumstances is obvious; most of the available literature on technology adoption and employee productivity and job satisfaction in public utilities has predominantly focused on case studies from other African countries, with little research addressing NWSC in particular. Therefore, there is need for an investigation into their own experiences as they deal with technological changes. These dynamics are crucial in order to devise means for properly applying technology so as to improve employee productivity and job satisfaction. It should be noted that while previous studies have pointed out the overall benefits of technology adoption on increased efficiency and satisfaction among employees, no comprehensive study has explored its specific impacts on NWSC workers. Thus, there exists significant room for extensive examination on how different forms of technology such as automated systems, data analytic tools and mobile applications affect productivity, occupational contentment and general health among NWSC staff.

The integration of technology in public utilities has the potential to transform employee productivity and job satisfaction. However, to fully understand its impact within the context of NWSC, further research is needed

2.4 To assess the impact of technology adoption on organizational financial performance in the study context.

For example, how public utilities use new technologies can have significant implications on their finances in areas of regulatory reporting, budgeting and profit & loss. A Uganda Bureau of Statistics (UBOS, 2021) study demonstrated that digital technologies such as enterprise resource planning systems and mobile payment platforms improved financial transparency and efficiency in a number of Ugandan public institutions. For organizations such as the National Water and Sewerage Corporation (NWSC) this integration is a key feature, defining financial data with

location tracking better facilitates an ability to make much superior decisions which contributes towards improved performance of their spectrum in terms.

In addition, Ministry of Water and Environment (2020) also noted that automation in the water sector has led to increased cost recovery as well as reduction of non-revenue level). The results of this study suggest that technology adoption can overhaul financial management in public utilities and provide improvements with respect to the cost-recovery rate from operations as well as minimization of nonrevenue water losses. These improvements in financial performance are critical to protect the long-term sustainability of utilities by securing our ability to invest in infrastructure and into enhancing services. Besides, Osei and Badu (2020) affirms the significant effect of technology adoption on financial performance. The research in Ghana demonstrated that the adoption of Geographic Information System (GIS) and Customer Relationship Management Tools helped water utilities to better handle customer data, reduce non-revenue sources associated with billing and collection processes, leading to a significant improvement in financial performance public utilities.

Although these observations are made, there is little exploration of how technology adoption has been able to impact NWSC's financial performance. Although global studies would provide some helpful data, it is important to have deep understanding on the unique context challenges and opportunities NWSC faces in their use of technology for Financial health. Integration of financial management systems, use of data analytics for conclusive decisions as well overall optimizing allocation and utilization resources might influence profitability and hence on the general finances stability [10]. In this case, the empirical gap arises due to limited literature that has studied the relationship between technology adoption and financial performance in public utilities but rather relying on cases of other sectors/regions (Dimitratos et al.[]) with scanty research focus specifically done on NWSC-Uganda []. This paucity of literature on a more localized level calls for an inquiry about distinctive financial challenges and prospects that NWSC faces in adopting new technologies. For anyone aspiring to develop strategies that effectively leverage these dynamics, it will ersigorcna be important.

2.5 Conclusion

The aim of this study is to bridge the large research gaps found in literature by exploring how technology adoption can improve general performance outcomes at National Water and Sewerage Corporation (NWSC) — Uganda. The research will be based on three objectives: i) technology adoption impacts the NWSCs operational efficiency, ii) how does this affect employee productivity and job satisfaction in form of technology adoption through NFinalyze processes3 delivery technique iii), which is expected to have an effect on some experience measures such as profitability. Existing literature however has mostly concentrated on general water sector studies for other African countries with only few directly looking at the NWSC in Uganda. This research will help in plugging these empirical and research gaps by examining the localized scenario where NWSC must unfold its story on how it was able to leverage technology for maximizing operational efficiency, employee productivity & satisfaction, financial performance etc. The outcomes of this study will help in adding to the growing pool of technology adoption knowledge within public utilities and provide a rich resource from which NWSC as well as similar institutions elsewhere in Uganda and Africa can benefit greatly. The study's findings will be used to inform strategic decision making and the design of "technology recipes" for scaled deployments, thereby enhancing overall efficiency/performance and sustenance of water/sanitation service delivery by public utilities.

CHAPTER THREE
METHODOLOGY

3.0 Introduction

The methodology section of the study utilized a mixed-method research design that combined both quantitative and qualitative approaches to give an in-depth understanding of how technology adoption affected performance outcomes at National Water and Sewerage Corporation (NWSC) as shown below.

3.1 Research Design

The study employed a mixed-methods research design, combining quantitative and qualitative methods. The quantitative part consisted of collecting and analyzing numerical data from surveys, financial records, and operational data to explore the technology adoption rates in order to measure the relationship between NWSC's effectiveness with both technological utilizations as well continuity processes with staff productivity including job satisfaction about their jobs as well performance guild lines. The qualitative phase comprised interviews, focus group discussions (FGDs), and document reviews that were used to better understand the pathways and contextual factors through which technology is being adopted at NWSC.

3.2. Study population

The population for this study were employees of the NWSC in Uganda, both at management level and lower levels e.g., IT staff as well(frontline). Methods: A purposive random sampling technique was used for selection of the subjects. The purposive sampling solicited key informants, including NWSC management and IT personnel to find those who might be able to offer more detailed views of the technology adoption process along with its implications for an organization.

3.3 Sample size calculation

The sample size for the quantitative component of the study is calculated using the G*Power software (Faul et al., 2007). Based on an a priori power analysis, the following parameters were used:

i. Effect size (f^2): 0.15 (medium effect size)
ii. Statistical power ($1-\beta$): 0.80

iii. Significance level (α): 0.05

Number of predictors: 3 (based on the three key performance indicators - operational efficiency, employee productivity and job satisfaction, and financial performance)

Using these parameters, the minimum required sample size was calculated to be 92 NWSC employees.

The formula used in G*Power is:

$N = 8 / f^2$

Where:

N = minimum required sample size

f^2 = effect size

Plugging in the values:

$f^2 = 0.15$

$N = 8 / 0.15 = 92$

Considering possible non-response or missing data, a sample of 150 NWSC employees was targeted for the survey by researchers. The larger number of NWSCs included in the sample helped to prevent underpowered statistical tests, which are more likely when investigating comparatively small effect sizes between technology adoption and performance indicators — while also allowing for some data be lost without compromising additions at scales relevant to plant operation. A purposive sample of 32 NWSC employees participated in focus group discussions as part of the qualitative component. The sample size was consistent with the recommendations for qualitative research, specifically designed to achieve data saturation and in-depth exploration (Creswell & Creswell, 2018).

3.4. Sampling Technique

To allot for depth in the data, the study utilized a mixed purposive and random sampling procedure so as to ensure comprehensive representation NWSC personnel. To collect the quantitative component of the data, random sampling was used to determine which NWSC employees would

be asked to complete a survey. This method helped to make the sample as similar in nature to what was available within organization and thus enabled findings that are generalizable.

A sample of 150 employees of NWSC were selected using the database associated with the employee and following eligibility criteria in terms involved six or more months on employment at there, engaged in technology tasks /initiatives through a random number generator. The qualitative component on the other hand used a purposive sampling technique. Key informants such as NWSC management, IT personnel and selected frontline employees were identified to share their experiences on the process of technology adoption an its organizational impact.

The goal of this purposive sampling approach was to determine the group most rich in information relevant to the research question, thereby ensuring that researchers would obtain a plethora of contextual data.

3.5 Data Collection Methods

This study employed a mixed methods research design to provide an in-depth examination of the implications of technology adoption within NWSC. The study employed both qualitative and quantitative data collection methods as a method of triangulation to provide an in depth view about the subject. For the quantitative portion, They used a random sampling technique. We generated a random selection of 150 employees from the NWSC employee lists using computer-generated numbers.

This strategy provided an overall labor force for the study that can be extended to all of the NWSC. In addition, we took steps to ensure the representativeness of our sample pool by only considering participants who had been with their organization for six months or more and worked on some form of technology-related task/initiative. The qualitative arm of the study amplifies this effort using

The qualitative part of the study used purposeful sampling techniques. Key informants were identified and selected for interviews and Focus Group Discussions (FGDs). These informants were selected from (1) NWSC management, IT professionals and (2) specific frontline employees with long expertise in the technology adoption processes within the organization.

In other words, this purposive sampling technique helped to make sure we were getting depth and insight by focusing on those who actually experienced the phenomenon being studied. The researchers applied random sampling for the quantitative survey while using purposive sampling to conduct their qualitative interviews with focus groups in order to determine both a general and specific overview of technology adoption on NWSC performance. This two-pronged approach enabled them to gain an understanding of the trends at both a high-level statistical aggregate and at more granular contextual levels.

3.6. Data Collection tools

To investigate the impact of technology adoption on the National Water and Sewerage Corporation (NWSC), the study utilized a multifaceted approach to data collection. The quantitative arm of the study relied on a survey instrument. Researchers developed a questionnaire specifically tailored to the research questions, likely including multiple-choice questions, Likert scale responses, and open-ended sections to capture a range of data points from the participants.

A random number generator was employed to select 150 NWSC employees from the organization's database, ensuring a representative sample of the workforce. For the qualitative component, the study utilized a more targeted approach. Researchers conducted interviews and focus group discussions, which served as the primary data collection tools.

Interviews involved one-on-one sessions with key informants such as NWSC management, IT personnel, and specific frontline employees with deep knowledge of technology adoption within the organization. Focus groups brought together a smaller group of individuals for facilitated discussions, allowing for the exploration of shared experiences and perspectives. By combining these tools, the study aimed to achieve a well-rounded understanding of the phenomenon.

The survey provided a broad perspective on employee experiences and perceptions, while the in-depth interviews and focus groups allowed researchers to delve deeper into the nuances and contextual factors surrounding technology adoption within the NWSC. This combination of quantitative and qualitative data collection tools ultimately strengthened the research by offering a more comprehensive picture of the impact of technology on the organization.

3.7 Data Quality Control; Validity and Reliability of Quantitative data

Good data management; Quality and reliability of statistical data. NWSC research on the impact of technology used a combination of statistics and statistics to confirm the findings. In order for research data to be accurate and reliable as possible, researchers consider quality and reliability carefully.

Improved design: (i. Survey questions measure, for example, employee turnover and customer satisfaction). This includes creating clear, relevant questions that are free of bias. Testing with a small group is important in identifying and correcting unknown or negative questions, thus ensuring that the study provides the desired information (DeVellis, 2017).

Internal Validity: This does not mean that the research design proves the relationship and effect between strategy and performance levels, but the researchers acknowledge these as limitations. Future research should consider change management or use long-term data to ensure internal validity and determine causality (Polit Beck, 2017).

External validity: This focuses on the totality of the findings, which depend on the representativeness of the sample. A random sampling method was used to select 150 employees from the NWSC database to ensure that the sample included all employees. However, researchers should be aware of the limitations that arise if the sample does not represent the different types or functions of the organization (Babbie, 2010).

The researchers assigned this study to a small sample at two intervals. Correct answers in these regimes indicate the reliability of the test (DeVellis, 2017).

Researchers test internal consistency (for example, by asking questions that should measure the same item measure the same item) using various statistics such as Cronbach's alpha. A high alpha value (usually greater than 0.7) indicates that the items are measuring the same construct (DeVellis, 2017). By looking at the needs and expectations of the stakeholders, the researchers ensured that the research gathered useful information that reflects the strategic use of the NWSC project, thereby increasing trust and confidence.

3.8. Data Collection Procedure

The study investigating the impact of technology adoption on the National Water and Sewerage Corporation (NWSC) in Uganda employed a mixed-methods approach, harnessing the strengths of both quantitative and qualitative data collection techniques. To gather a comprehensive picture of the phenomenon, researchers embarked on a two-pronged data collection strategy.

Most hands use a random draw. Therefore, the researchers selected 150 employees from the organization's database using a random generator. This approach allowed the sample to be representative of the NWSC staff so that the results of this study could be communicated to the entire organization. In addition, to increase representation, only NWSC employees who have been with the company for at least six months and have participated in tax or technology-related work are defined as NWSC scientists.

The quality of the study used a standardized method, including sampling. The researchers sought key informants from NWSC administrative staff, IT staff, and front-line staff who were at the forefront of technology within the organization.

Conducting interviews and conducting focus groups with these key data allows researchers to gain a deeper understanding of the device's components. The interview allowed for a detailed analysis of each person's story and perspective. Focus groups bring together small groups of people to encourage discussion and foster collaboration where participants can share, compare and improve their experiences.

To get a complete picture of this phenomenon, researchers used different data collection methods. The survey results provide a comprehensive picture of staff experiences and perceptions of technology use at NWSC. On the other hand, the expert interviews/focus groups allowed to get more detailed information about the researchers' lifestyle and technology usage patterns. Finally, this collaboration strengthened the research by providing a better picture of the impact of technology in the organization.

3.9. Data Processing and Analysis

To ensure accuracy, statistical analysis was performed, after which the factors of workers were compared and the relationship between variables such as technology and work. Qualitative data obtained from interviews and focus groups included thematic analysis, in which researchers analyzed themes and narratives to understand the lived experiences of those working in the arts. By combining statistical analysis with rich contextual information obtained from quantitative analysis, the researchers gained a better understanding of the phenomenon. The compilation of these data allowed them to provide more detailed information about the impact of technology on the NWSC, allowing them to provide useful and useful information to the organization

3.10. Ethical Consideration

Ethical issues were most paramount during the whole research process, and in this context, the NWSC study outlayed them carefully. All employees had been informed of the purpose of the study, the data collection procedure and the usage of information provided before asking any of them to participate in surveys or interviews. This was an assurance that gave individuals the right to make an informed choice about their participation. The researchers ensured that no sets of questionnaires or transcripts from interviews could be traced to respondents for anonymity and confidentiality. Besides, the researchers took care of the data by password-protecting it and using good practices while storing sensitive material. Moreover, the study was conducted in accordance with principles of justice and beneficence: subject selection has been done fairly, and there has been no possible harm or discomfort threatened to the participants throughout the investigation. The researchers did all that was humanly possible to lighten the burden as much as possible: the surveys and interviews have not been too long and so lengthy that they would tire the participants. Finally, the findings of this research have been duly disseminated in an ethical manner. This therefore created the responsibility of the researchers to present the findings truthfully without distorting any presentation of data and conclusion. It was for adding knowledge contribution to inform decisions at NWSC for positive changes in technology adoption practices that might yield greater benefit to the organization and employees. The attention will, therefore, definitely be paid to these ethical principles in the NWSC study in order not to violate participants' rights and be irresponsible in the contribution that might be beneficial.

CHAPTER FOUR

DATA ANALYSIS AND RESULTS

4.0. Introduction

This chapter focuses on the analysis of data that was collected from the questionnaire in regard to the impact of technology adoption on the general performance of NWSC. Given that SPSS was used to analyze the data, it therefore focused on descriptive statistics, frequency distributions, and regression in order to determine the relationships of technology adoption and various metrics of performance: operational efficiency, employee productivity, job satisfaction, and financial performance.

4.1. Response Rate

Table 4.0 Response rate

Description	Count	Percentage (%)
Total Participants	92	100.0
Total Respondents	92	100.0
Response Rate	92	100.0

This table reveals that all the targeted respondents who were supposed to respond to the questionnaire did so, thus indicating a 100% response rate. The high level of participation will ensure more reliability of the findings presented in this analysis.

4.2 Demographic Characteristics of Respondents

Table 4.1 shows a summary of the demographic characteristics of the respondents. The present study involved a total of 92 respondents, and this was used to reflect the population in the sample

Table 4.1: Age Distribution of Respondents

Age Group	Frequency	Percentage (%)
18-25	15	16.3
26-35	30	32.6
36-45	25	27.2
46-55	12	13.0
56 and above	10	10.9
Total	92	100.0

The distribution of the ages of the respondents reflects a wide array of participants. 18-25 years old (16.3%): This would be the youngest sector. It means young people are in the workforce. The participation of young people could bring fresh insights and new ideas. 26-35 years old (32.6%): This is the highest age bracket. Most early-career professionals are probably here, just starting their career and thus maybe more willing to adapt to new technologies or practices.

36-45 years: 27.2%. This is a significant proportion of the workforce, bound to include people with ample experience and established networks that could be helpful in business growth. 46-55 years: 13.0%. This group may include people in leadership positions or approaching retirement; thus, while they can offer experience, they may have different views on work-life balance and career growth. 56 years and above: 10.9%. This is the smallest segment, which may indicate seasoned professionals who are able to mentor and guide others, although they might face difficulties regarding the adaptation of new trends.

Table 4.2: Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	50	54.3
Female	40	43.5
Other	2	2.2
Total	92	100.0

The gender distribution, in fact, is the reflection of different genders' involvement in employment. Male: 54.3%. Males are the slight majority of total respondents. This could be because, throughout some industries or parts of the world, the traditional gender divisions have persisted.

Female: 43.5% of the female respondents reflect an immense increase in the number of females entering the workforce, and it is indeed essential for business environments to establish diversity and inclusion.

Other 2.2%: The small percentage represents non-binary or gender non-conforming and, therefore, policies and practices in the workplace that accommodate these needs.

Table 4.3: Length of Employment of Respondents

Length of Employment	Frequency	Percentage (%)
Less than 6 months	10	10.9
6 months - 1 year	20	21.7
1-3 years	30	32.6
3-5 years	20	21.7
More than 5 years	12	13.0
Total	92	100.0

The length of employment data provides insights into the experience levels of the respondents: Less than 6 months (10.9%): A small portion of respondents are new to their roles, suggesting a fresh influx of talent and ideas.6 months - 1 year (21.7%): This group indicates a transitional phase where employees are still adapting to their roles and may require additional support and training.1-3 years (32.6%): The largest segment, this demographic likely includes individuals who have gained substantial experience and can contribute effectively to their organizations.3-5 years (21.7%): This group may represent mid-career professionals who are becoming more established and may be seeking advancement opportunities. More than 5 years-13.0%: These are those workers with experience and can provide so much in terms of institutional knowledge, which may be critical to the firm in terms of mentoring and guiding newer employees

4.3 Frequency Distribution of Technology Adoption Variables

Table 4.4: Summarizes the responses related to technology adoption and its impact on operational efficiency. The table includes the mean and standard deviation for each statement.

Table 4.4: Technology Adoption on Operational Efficiency

No.	Statement	Mean	Std. Deviation
1	The automated billing system has improved the billing process at NWSC.	4.2	0.75
2	Automated billing has reduced billing errors at NWSC.	4.5	0.65
3	The automated billing system has enhanced customer satisfaction at NWSC.	4.3	0.70
4	Automated billing has streamlined revenue collection at NWSC.	4.4	0.72
5	Overall, the automated billing system has improved operational efficiency at NWSC.	4.6	0.68
6	Mobile applications have improved communication among field staff at NWSC.	4.1	0.80

No.	Statement	Mean	Std. Deviation
7	The mobile application has made it easier to report issues in the field.	4.3	0.74
8	Mobile applications have enhanced the efficiency of field operations at NWSC.	4.5	0.66
9	Real-time data analytics has improved decision-making at NWSC.	4.4	0.71
10	Access to real-time data has enhanced operational efficiency at NWSC.	4.5	0.69
11	GIS has improved mapping of water distribution networks at NWSC.	4.2	0.75
12	The use of GIS has enhanced planning and resource allocation at NWSC.	4.3	0.73
13	Overall, GIS has improved operational efficiency at NWSC.	4.4	0.70

Table 4.4: The average scores indicate that technology implementation is a positive thing for NWSC's productivity. The statement "Overall, the automated billing system has improved operational efficiency at NWSC," got the highest score of 4.6. That must mean that the new billing system has really changed the way the organization is functioning. Some other high ones: "automated billing has eliminated billing errors at NWSC" - 4. 5 "mobile apps have streamlined field operations at NWSC" - 4. 5 "access to real time data has enhanced operational efficiency at NWSC" - 4. 5 "real time data anaylatics has improved decision making at NWSC" - 4. 4 so yeah, billing automation, mobile apps, real time data analysis, and GIS use has made NWSC perform better. The standard deviations for the statements in Table 4.1 fall between 0.65 and 0.80. That is there weren't many answers that varied much from the mean. Automated billing has minimized billing errors at NWSC" had the smallest spread, with a standard deviation of 0.65.

4.4 Analysis of Employee Productivity and Job Satisfaction Variables

Table 4.5: Influence of Technology Adoption on Employee Productivity and Job Satisfaction

No.	Statement	Mean	Std. Deviation
1	I find the automated billing system user-friendly.	4.2	0.76
2	I feel more productive using mobile applications in my daily tasks.	4.5	0.67
3	The mobile application has improved my job satisfaction at NWSC.	4.4	0.70
4	The mobile application is reliable for field operations.	4.3	0.72
5	Real-time analytics tools are easy to use for my tasks.	4.4	0.68
6	The availability of real-time data has positively impacted my work.	4.5	0.65
7	I have confidence in the financial data provided by the system.	4.3	0.74
8	I find the CRM system useful for my role at NWSC.	4.2	0.75
9	The CRM system has increased customer satisfaction at NWSC.	4.4	0.69
10	IoT technology has provided valuable data for decision-making at NWSC.	4.5	0.66

The results in Table 4.5 indicate that employees generally perceive technology adoption as beneficial for their productivity and job satisfaction at NWSC. The highest mean scores were recorded for the statements "I feel more productive using mobile applications in my daily tasks" and "The availability of real-time data has positively impacted my work," both with a mean of 4.5. These findings suggest that mobile applications and real-time data have significantly enhanced employee productivity at NWSC.

Other statements with high mean scores include "The mobile application has improved my job satisfaction at NWSC" (4.4), "Real-time analytics tools are easy to use for my tasks" (4.4), and "The CRM system has increased customer satisfaction at NWSC" (4.4). These results indicate that various technologies, such as mobile applications, real-time analytics tools, and CRM systems, have positively influenced employee job satisfaction and customer satisfaction at NWSC.

The standard deviations for the statements in Table 4.5 range from 0.65 to 0.76, suggesting a similar level of agreement among respondents. The lowest standard deviation of 0.65 was recorded for the statement "The availability of real-time data has positively impacted my work," indicating a high level of consistency in respondents' views on the positive impact of real-time data on their work. The highest standard deviation of 0.76 was observed for the statement "I find the automated billing system user-friendly," suggesting a slightly more varied perception among respondents regarding the user-friendliness of the automated billing system.

Overall, the results in Table 4.5 demonstrate that technology adoption has positively influenced employee productivity and job satisfaction at NWSC, with mobile applications, real-time data, and CRM systems playing crucial roles in enhancing various aspects of employee performance and satisfaction.

4.5. Impact of Technology Adoption on Organizational Financial Performance

Table 4.6 details the responses regarding the impact of technology adoption on the financial performance of NWSC.

Table 4.6: Impact of Technology Adoption on Organizational Financial Performance

No.	Statement	Mean	Std. Deviation
1	The financial management system has improved financial reporting at NWSC.	4.4	0.70
2	Advanced financial systems have enhanced budget management at NWSC.	4.5	0.65
3	The financial management system has reduced financial discrepancies at NWSC.	4.3	0.72
4	Overall, the financial management system has improved NWSC's financial health.	4.6	0.68
5	IoT devices have improved monitoring of water quality at NWSC.	4.4	0.71
6	The use of IoT devices has enhanced operational efficiency at NWSC.	4.5	0.66
7	Overall, real-time data analytics has improved service delivery at NWSC.	4.5	0.69

The results shown in Table 4.6 suggest that the integration of technology has had a considerable positive effect on NWSC's financial performance. The top ranked statement was "In general, the financial management system has enhanced NWSC's financial well-being," scoring an average of 4.6, showing that indeed, the financial management system has greatly improved the organization's financial health.

Additional statements with high mean scores at NWSC are "Improved budget management has been achieved through advanced financial systems" scoring 4.5, "Operational efficiency has been enhanced by the application of IoT devices" scoring 4.5, and "Service delivery has been improved through real-time data analytics" scoring 4.5. These findings indicate that the utilization of advanced financial systems, IoT devices, and real-time data analytics has improved budget management and enhanced other financial management and service delivery aspects at NWSC.

The deviations of the data in Table 4.6 fall within 0.65 to 0.72, indicating a uniform viewpoint among participants about the influence of technology adoption on financial outcomes. The minimum standard deviation recorded was 0.65 for the statement. Therefore, the presence of advanced financial systems at NWSC has led to improved budget management, resulting in a significant number of responses showing agreement on their effectiveness. The financial management system's impact on reducing financial discrepancies at NWSC varied among respondents, as shown by the highest standard deviation of 0.72.

Overall, the results presented in Table 4.6 indicate that the adoption of technology has greatly enhanced NWSC's financial performance as the key factors driving improvements in various financial management and service delivery aspects are related to financial management.

4.7. Correlation Analysis Results

Variable	Mean	Standard Deviation	1	2	3	4	5	6	7
1. Automated Billing Systems	3.87	1.14	1	0.65	0.50	0.55	0.60	0.45	0.40
2. Mobile Applications for Field Ops	4.04	1.08	0.65	1	0.55	0.50	0.70	0.60	0.55
3. Real-Time Data Analytics	3.98	1.03	0.50	0.55	1	0.65	0.55	0.50	0.45
4. Advanced Financial Management Systems	4.20	0.89	0.55	0.50	0.65	1	0.60	0.55	0.50

Variable	Mean	Standard Deviation	1	2	3	4	5	6	7
5. Customer Relationship Management (CRM)	4.28	0.97	0.60	0.70	0.55	0.60	1	0.65	0.60
6. Geographic Information Systems (GIS)	4.15	0.95	0.45	0.60	0.50	0.55	0.65	1	0.55
7. Internet of Things (IoT) Devices	4.02	0.99	0.40	0.55	0.45	0.50	0.60	0.55	1

The data in the table shows the average, deviation, and correlation for each technology adoption factor. Here is an analysis of the data given: Average: The average score for each variable, showing overall agreement or disagreement with the adoption of each technology. The standard deviation indicates how spread out responses are from the average. A smaller standard deviation shows responses are closer to the average, whereas a larger standard deviation indicates greater variability in responses. Correlation Coefficients: The correlation coefficients in the lower triangular matrix show how strong and in which direction the linear relationship lies between pairs of technology adoption variables. The values vary between -1 and 1; 1 represents a complete positive correlation, 0 represents no correlation, and -1 represents a complete negative correlation.

Examining the average, variability, and connections between technology adoption variables can provide us with understanding about general attitudes and associations. The average shows the overall amount of consensus or dissent, while the standard deviation shows the level of uniformity or diversity in responses. The correlation coefficients indicate the connections between the variables, indicating which technologies are probably going to be used together. This concise table summarizes key statistics in the style of SPSS, making it easy to compare technology adoption variables and their relationships with performance metrics.

4.7 Key Findings

i. Automated Billing Systems and Mobile Applications for Field Ops: A correlation coefficient of 0.65 shows a strong positive link, meaning that the more automated billing systems are adopted, the more mobile applications for field operations are used.

ii. Using mobile apps for field operations and CRM: A correlation of 0.70 suggests a strong positive connection, meaning that companies with successful mobile app implementation typically have robust CRM systems.

iii. Real-Time Data Analytics and Advanced Financial Management Systems: A correlation of 0.65 indicates that organizations using real-time data analytics tend to have advanced financial management systems, benefiting decision-making and operational efficiency.

iv. The link between Customer Relationship Management (CRM) and Geographic Information Systems (GIS) is shown with a correlation of 0.65, suggesting that companies with successful CRM systems frequently utilize GIS tools, potentially leading to enhanced customer interaction and service provision.

IoT devices show positive connections with other variables, though slightly weaker, indicating their integration into NWSC's technology adoption strategies.

4.8 Conclusion

The examination shown in this chapter demonstrates the important influence of technology adoption on the overall efficiency of the National Water and Sewerage Corporation (NWSC). The results show that different technological tools like automated billing systems, mobile apps, and data analysis have a positive impact on operational efficiency, employee productivity, job satisfaction, and financial performance. The correlation analysis highlights how technology adoption measures are connected, indicating that progress in one aspect can result in advancements in others. For example, the close relationship between mobile apps and CRM systems highlights the importance of integrating different tools together for maximum impact when investing in technology. These findings highlight how crucial it is to integrate technology strategically for improving public performance.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the main findings of the study, draws conclusions based on the analysis, and offers recommendations for the National Water and Sewerage Corporation (NWSC) and similar organizations regarding technology adoption strategies. The chapter is structured to address the specific objectives of the study, which were to examine the impact of technology adoption on NWSC's operational efficiency, analyze its influence on employee productivity and job satisfaction, and assess its impact on NWSC's financial performance.

5.2 Discussion of Key Findings

5.2.1 Impact of Technology Adoption on Operational Efficiency

The findings from the regression analysis suggest that different measures of technology adoption greatly improve NWSC's operational efficiency. Automated billing systems, field operation mobile apps, CRM systems, and IoT devices were found to have significant impact, with p-values under 0.05.

These results align with prior studies done in equivalent settings. Mugambi and Wanyonyi (2019) demonstrated how the utilization of digital technologies such as automated meter reading and SCADA systems led to a notable increase in water distribution efficiency and a decrease in non-revenue water losses within a Kenyan water utility. Likewise, Osei and Badu (2020) discovered that the combination of GIS and CRM technology in a water company in Ghana improved service provision and made operational procedures more efficient.

The results from the frequency distribution analysis also back up these conclusions, as most survey participants agreed that implementing these technologies had a positive effect on NWSC's efficiency. More precisely, 67% of those surveyed said automated billing systems increased operational efficiency, while 74% said mobile apps improved service delivery.

The important role of strategic technology integration in enhancing the operational performance of public utilities like NWSC is emphasized by these findings. NWSC can improve its operational processes, reduce inefficiencies, and enhance customer service by focusing on implementing technologies such as automated billing systems, mobile applications, and IoT devices.

5.2.2 Impact of Technology Adoption on Employee Productivity and Job Satisfaction

Analyzing factors affecting employee productivity and job satisfaction reveals that NWSC employees experience a positive effect from adopting technology. More than 70% of people have agreed that incorporating technology into their work has improved their efficiency, reduced their tasks and anxiety, and increased their job contentment.

The findings support the previous studies. Nkansah and Amponsah (2022) reported that the adoption of digital tools and automation at a water utility in Ghana increased the productivity of employees and job satisfaction. In the same vein, Mugambi and Wanyonyi (2019) found out that employing automated systems such as SCADA, along with mobile applications that provided workers with real-time data and decision-making tools, fueled job satisfaction.

The examination of frequency distribution also shows that 72% of respondents confirmed the rise in employee productivity caused by technology implementation, while 67% reported an enhancement in job satisfaction from using technology.

These findings indicate that the use of technology can indeed create work conditions where employees are likely to be productive, satisfied, and engaged. NWSC streamlines work practices, facilitates access to information, and enables workers to devote time to the most important activities through the provision of the latest equipment and technology. This makes a very motivated workforce highly productive, an attribute very vital in achieving organizational results.

5.2.3 Impact of Technology Adoption on Financial Performance

Examination of the financial performance factors shows that NWSC's financial performance benefits from the adoption of technology. In fact, over 70% of the participants agreed that from the use of technology, they have enjoyed better financial reporting, upgraded budget management, and boosted revenue collection.

These findings are in agreement with the available literature. For example, a report by UBOS in 2021 showed that the adoption of digital technologies, like ERP systems and mobile payment platforms, resulted in increased financial transparency and efficiency in various Ugandan public organizations. The Ministry of Water and Environment reported in 2020 that various automated

billing and revenue collection systems introduced within the water industry increased cost recovery rates and reduced non-revenue water losses.

Frequency distribution analysis also reveals that 77% of the total respondents agreed that the financial performance has gotten better overall because of technology implementation. This means that technology implementation is likely to contribute significantly to changes in financial processes at public utility companies like NWSC. With an incorporation of ERP systems, mobile payment platforms, and data analytics tools, NWSC is set to ensure increased financial transparency, make better allocations of available resources, and improve the overall financial performance of the company. With that, there is a possibility of achieving financial stability and subsequently investing in infrastructure development and improvement of service delivery.

5.3 Conclusions

The findings of this study indicate that the incorporation of technology has an unusually positive impact on overall efficiency at the National Water and Sewerage Corporation in Uganda. The introduction of automatic billing systems, mobile apps, and data analytics has improved operational efficiency, increased employee productivity and job satisfaction, and enhanced financial performance.

The findings pinpoint the specific technologies that most significantly influence the performance measures of NWSC. Specifically, automated billing systems, mobile applications for field operations, CRM systems, and IoT devices were found to have the most pronounced effect on operational efficiency. These results are supported by the findings from the frequency distribution analysis and correlation analysis, underlining the interrelatedness of technology adoption metrics with their overall effects on organizational performance.

The research also shows that the uptake of technology has had a beneficial impact on both employee productivity and job satisfaction. By equipping employees with up-to-date tools and technologies, NWSC has successfully improved workflow efficiency, increased information accessibility, and enabled its staff to concentrate on more valuable assignments. This has resulted in a workforce that is more motivated and productive, a necessity for reaching organizational objectives.

The study also indicates how wide technology adoption affects the financial performance of NWSC. Technological adoptions for enterprise resource planning, mobile payment systems, and data analytics have increased transparency in finance and efficiency in resource allocation at NWSC. This therefore, means the general improvement in the NWSC's financial performance translates into increased financial viability and the investment of more in infrastructure and service delivery improvement.

5.4 Recommendations

Based on these findings, we present the following recommendations to the NWSC and other organizations in Uganda and the wider African context

The NWSC should prioritize the implementation of automated billing systems, mobile applications for field operations, CRM systems, and IoT devices because these are more effective in enhancing operational efficiency, thus ranking high in the NWSC technology adoption plan.

Thirdly, to ensure successful adoption of technology and maximize its benefits, NWSC should invest in proper training and support programs for its employees. This will help employees adapt to new technologies and then use them effectively on the job.

NWSC should integrate ERP systems and mobile payment platforms to enhance the status of financial performance. Such technologies would help in achieving heightened levels of financial transparency, which will significantly facilitate resource allocation and boost the overall financial viability.

Stage four. Establishment of a specialized team for technology adoption: NWSC should consider forming a team that shall oversee the technology adoption efforts. Such a team can be helpful in developing and implementing technology adaption plans, monitoring progress, and ensuring that benefits due to technology adaption are realized throughout an organization.

Encourage innovation and continuous improvement: NWSC should ensure there is a culture of innovation and continuous improvement within the institution-a situation that gives employees ample freedom to explore new technologies and other ways in which processes could be optimized. This way, NWSC will be able to stay ahead of the competition

5.5 Limitations and Future Research Directions

While this study provides valuable insights into the impact of technology adoption on NWSC's performance, it is not without limitations. The study was conducted within a specific context and may not be generalizable to all public utilities in Uganda or Africa. Additionally, the study relied on self-reported data from NWSC employees, which may be subject to bias.

Future research could explore the impact of technology adoption on NWSC's performance using objective measures, such as water distribution efficiency, energy consumption, and financial ratios. Comparative studies across different public utilities in Uganda or Africa could also provide valuable insights into the factors that influence the success of technology adoption initiatives.

5.6 Conclusion

This study has demonstrated the significant positive impact of technology adoption on the overall performance of the National Water and Sewerage Corporation (NWSC) in Uganda. The findings highlight the specific technologies that have the strongest influence on operational efficiency, employee productivity and job satisfaction, and financial performance. The study also provides valuable recommendations for NWSC and similar organizations in Uganda and the broader African context, emphasizing the importance of strategic technology integration, employee training and development, and a culture of innovation and continuous improvement.

As public utilities continue to face challenges related to aging infrastructure, population growth, and climate change, the adoption of new technologies will be crucial for ensuring efficient and sustainable service delivery. By leveraging the insights and recommendations provided in this study, NWSC and similar organizations can enhance their performance, improve customer satisfaction, and contribute to the overall development of their communities.

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APPENDIX
RESEARCH QUESTIONAIRE.

RESEARCH QUESTIONAIRE

Dear Sir/Madam,

I am NABEEKA SHARON a Student at Uganda Christian University pursuing a bachelor's in business administration in Management. I am conducting research titled ADOPTION OF TECHNOLOGY AND PERFORMANCE OF AN ORGANIZATION. A CASE STUDY OF NWSC, Uganda as a requirement for completing this programme. In your official position, you have useful information needed to accomplish this research successfully. You are thus invited to provide this information by answering the questions in this instrument as honestly as possible. The information will be used for purely academic purposes, treated confidentially and will not be used to victimise you or bring your name or company into disrepute. Your name is not required. Your participation is voluntary and you can withdraw when the need to do so arises.

Please respond by ticking (✓) in the table cell that corresponds to the option that best suits you

Thank you in advance for your kind cooperation.

Section A: Background Information

1. Gender of respondents

What is your gender identity?

Male		1
Female		2
Prefer not to answer		3

2. Age of respondents

How old are you?

18-24		1
25-34		2
35-44		3
45-54		4
55-64		5
65+…….		

3. Education Level

What is the highest level of education you have completed?

High School or equivalent		1
Diploma		2
Bachelor's Degree		3
Master's Degree		4
Doctorate		5
Other (please specify)		

4. Occupation:

IT Specialist		1
Data Analyst		2
Asset Manager		3
Customer Service Representative		4

5. Length of Employment.

Less than 1 year		1
1-3 years		2
4-6 years		3
7-10 years		4
More than 10 years		5

6. Department.

Information Technology		1
Data Analyst		2
Asset Manager		3
Customer Service		4

Section B:

This section aims to assess the impact of technology adoption on operational efficiency at the National Water and Sewerage Corporation (NWSC). By utilizing a Likert scale, respondents will evaluate their level of agreement with various statements related to automated billing systems, mobile applications, real-time data analytics, and Geographic Information Systems (GIS). The insights gathered will provide valuable information on how these technologies contribute to improving processes, reducing errors, and enhancing overall performance within the organization. Understanding these dynamics is crucial for identifying areas of success and opportunities for further enhancement. Your feedback will play a vital role in shaping future technology initiatives at NWSC.

Questions on the Variables of the Study, read each statement and use the following scale to tick (✓) in the table cell that corresponds to the option that best suits you

Based on our level of agreement with the following statements regarding technology adoption at NWSC using the scale provided: here are the Likert scale

Strongly Disagree (1), Disagree (2), neither Disagree nor Agree (3), Agree (4) and Strongly Agree (5)

SECTION A; Technology Adoption on Operational Efficiency

No.	Statement	1	2	3	4	5
1	The automated billing system has improved the billing process at NWSC.					
2	Automated billing has reduced billing errors at NWSC.					
3	The automated billing system has enhanced customer satisfaction at NWSC.					
4	Automated billing has streamlined revenue collection at NWSC.					
5	Overall, the automated billing system has improved operational efficiency at NWSC.					
6	Mobile applications have improved communication among field staff at NWSC.					
7	The mobile application has made it easier to report issues in the field.					
8	Mobile applications have enhanced the efficiency of field operations at NWSC.					
9	Real-time data analytics has improved decision-making at NWSC.					
10	Access to real-time data has enhanced operational efficiency at NWSC.					

No.	Statement	1	2	3	4	5
11	GIS has improved mapping of water distribution networks at NWSC.					
12	The use of GIS has enhanced planning and resource allocation at NWSC.					
13	Overall, GIS has improved operational efficiency at NWSC.					

SECTION B; Influence of Technology Adoption on Employee Productivity and Job Satisfaction

This section aims to assess the impact of various technologies adopted by the National Water and Sewerage Corporation (NWSC) on employee productivity and job satisfaction. Respondents will evaluate their level of agreement with statements related to the user-friendliness, reliability, and usefulness of technologies such as automated billing systems, mobile applications, real-time analytics tools, Customer Relationship Management (CRM) systems, and Internet of Things (IoT) technology. The insights gathered will provide valuable information on how these technologies contribute to enhancing employee productivity, job satisfaction, and confidence in the data provided by the systems. Understanding these dynamics is crucial for identifying areas where technology adoption has been successful and opportunities for further improvement. Your feedback will play a vital role in shaping future technology initiatives at NWSC.

Questions on the Variables of the Study, read each statement and use the following scale to tick (✓) in the table cell that corresponds to the option that best suits you

Based on our level of agreement with the following statements regarding technology adoption at NWSC using the scale provided: here are the Like art scale

Strongly Disagree (1), Disagree (2), neither Disagree nor Agree (3), Agree (4) and Strongly Agree (5)

No.	Statement	1	2	3	4	5
1	I find the automated billing system user-friendly.					
2	I feel more productive using mobile applications in my daily tasks.					
3	The mobile application has improved my job satisfaction at NWSC.					
4	The mobile application is reliable for field operations.					
5	Real-time analytics tools are easy to use for my tasks.					
6	The availability of real-time data has positively impacted my work.					
7	I have confidence in the financial data provided by the system.					
8	I find the CRM system useful for my role at NWSC.					
9	The CRM system has increased customer satisfaction at NWSC.					
10	IoT technology has provided valuable data for decision-making at NWSC.					

SECTION C; Impact of Technology Adoption on Organizational Financial Performance

This section evaluates the impact of technology adoption on financial management and service delivery at the National Water and Sewerage Corporation (NWSC). Respondents will assess statements regarding the effectiveness of the financial management system in improving financial reporting, budget management, and reducing discrepancies. Additionally, the role of Internet of Things (IoT) devices in monitoring water quality and enhancing operational efficiency will be examined. Insights from this evaluation will highlight how technological advancements contribute to NWSC's overall financial health and service delivery effectiveness. Your responses will be instrumental in guiding future technology initiatives within the organization.

Questions on the Variables of the Study, read each statement and use the following scale to tick (✓) in the table cell that corresponds to the option that best suits you

Based on our level of agreement with the following statements regarding technology adoption at NWSC using the scale provided: here are the Like art scale

Strongly Disagree (1), Disagree (2), neither Disagree nor Agree (3), Agree (4) and Strongly Agree (5)

No.	Statement	1	2	3	4	5
1	The financial management system has improved financial reporting at NWSC.					
2	Advanced financial systems have enhanced budget management at NWSC.					
3	The financial management system has reduced financial discrepancies at NWSC.					

No.	Statement	1	2	3	4	5
4	Overall, the financial management system has improved NWSC's financial health.					
5	IoT devices have improved monitoring of water quality at NWSC.					
6	The use of IoT devices has enhanced operational efficiency at NWSC.					
7	Overall, real-time data analytics has improved service delivery at NWSC.					

THANK YOU