The Roles of E-Government on Effective Services Delivery in the Health Sector: A Case of Muhimbili Referral Hospital, Tanzania

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ABSTRACT

This study aimed to examine the role of e-government in enhancing service delivery at Muhimbili National Hospital, Tanzania's largest public health facility located in Dar es Salaam. Utilizing a case study research design with a mixed-methods approach, the study combined both quantitative and qualitative research methods to provide a comprehensive understanding of the e-government system's impact. The theoretical framework guiding this study was the Technology Acceptance Model (TAM), which examines users' acceptance of technology based on perceived usefulness and ease of use. The study's population consisted of 4,900 individuals, including hospital staff, patients, and other stakeholders. A sample size of 282 respondents was selected using stratified random sampling to ensure representation from different departments and roles within the hospital. Data collection was conducted through structured questionnaires and semi-structured interviews. Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS), with results presented through frequency distribution tables and descriptive statistics. Qualitative data were analyzed using thematic analysis to identify patterns and themes related to the e-government system's impact on service delivery. The findings revealed that the implementation of e-government at Muhimbili National Hospital has significantly improved various aspects of service delivery. For instance, the system has reduced patient waiting times, as reflected in a mean score of 3.68 with a standard deviation (SD) of 1.249. Additionally, the study observed faster transaction processing, with a mean score of 3.18 and SD of 1.108, and more efficient management and retrieval of patient records, achieving a mean score of 3.44 and SD of 1.256. The e-government system also streamlined the allocation of doctors to patients (mean = 3.22, SD = 1.109) and ensured the timely administration of medications and treatments (mean = 3.39, SD = 1.468). Moreover, the system facilitated better integration with service providers, such as insurance companies, as evidenced by a mean score of 3.77 and an SD of 1.268. In conclusion, the adoption of e-government at Muhimbili National Hospital has positively transformed healthcare service delivery by enhancing accessibility, communication, resource management, and data-driven decision-making. The study recommends ongoing impact assessments to measure the tangible benefits of e-government, focusing on key performance indicators such as patient satisfaction, waiting times, and operational efficiency. Additionally, it underscores the importance of strengthening cybersecurity measures to protect patient data and maintain stakeholder trust. Continuous monitoring and evaluation are also advised to ensure that the e-government system evolves with the hospital's needs and goals.

Keywords: E-Government, Healthcare Transformation, Service Delivery, Technology Acceptance Model

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I. INTRODUCTION

E-government has emerged as a transformative opportunity facilitated by Information and Communication Technologies (ICTs), promoting good governance and development in both developed and developing countries (Ashaye & Irani, 2019). The implementation and impact of e-government initiatives vary significantly across nations, reflecting differences in technological infrastructure, human resource development, and strategic priorities. In developed countries, e-government has seen substantial progress. The United Kingdom, for instance, has continually innovated its digital government services, creating models that have been emulated globally (United Nations, 2020). Similarly, Australia and the Republic of Korea have made significant strides by establishing robust telecommunication infrastructures, investing in human resource development, and expanding the reach and effectiveness of their e-government services (Kumar et al., 2021).

The E-Government Development Index (EGDI) demonstrates the rapid growth of e-government over the past two decades is evident from the E-Government Development Index (EGDI). The 2016 UN E-Government Survey reported that 29 countries achieved "very high" EGDI scores (ranging from 0.75 to 1.00), a significant increase from just 10 countries in 2003 (United Nations, 2016). This trend indicates a growing global commitment to digital governance and service delivery. However, the adoption and effectiveness of e-government are not uniform across the globe. Significant disparities exist both within and between countries. Factors such as limited access to technology, poverty, and inequality continue to hinder the full realization of e-government's potential for sustainable development in many regions (Budding et al., 2022). The digital divide is particularly pronounced between developed and

developing nations. As of 2019, there remained a substantial gap between African countries, with an average EDGI of 0.2882, and European countries, with an average EDGI of 0.7241. This disparity is further illustrated by the fact that European countries provide approximately ten times more e-government services than African and Oceanian nations (Sharma et al., 2021).

The promotion of e-governance comes with a large number of other services, such as opening clean clinical folders, accepting patients' admissions, and registering incoming patients. E-government is important for the entire African economy since developing it will improve the economies of all countries on the continent. E-development inspires entrepreneurs to come up with new solutions, but Africa's economy will only benefit from this if governments order services from companies that are already actively offering their services on the continent. E-government has revolutionized the way service delivery is conducted, with efficiency, transparency, increased participation, democracy, and customer satisfaction being some of the dividends that come with the use of ITC in both developing countries. Thus, it is agreed that e-government is an innovative attempt to take advantage of ICT to facilitate citizens' access to government information and services to support social, economic, and political development, improve the quality of public service, and provide an avenue for citizens to interact with government institutions and processes in a democratic, transparent, and equitable way (Malodia et al., 2021). The services in question include, but are not limited to, law and order, regulation compliance, economic development, permits and licenses, social services, infrastructure, national social security and defense, and anti-corruption alerts, among others (Arayankalam, 2021). Moreover, the government of Tanzania introduced an e-government agency (eGA) in 2012, which also aimed to ensure the implementation of e-government in Tanzania. It is for this reason that the government of 2019 decided to enact a law that allows the adoption and implementation of the e-government system in Tanzania with the view of improving service delivery (Furuholt and Sæbø 2018). Furthermore, in 2019, the government of Tanzania introduced the e-Government Authority Act, No. 10, to coordinate, oversee, and promote e-government initiatives and enforce e-government-related policies, laws, regulations, standards, and guidelines in public institutions.

Research studies conducted in Tanzania depicted that system implementation is properly utilized for the service intended; some projects that support e-government have been abandoned before completion, hence affecting e-government operations (Sichone & Mbamba, 2021). Also, there is a duplication of work whereby officials in the public sector make use of both legacy and automated processes, which discourages the performance of the e-government system (Mkwizu & Sichone, 2019). Moreover, there are challenges such as a lack of awareness of the value of e-government, especially among the public, insufficient management and political support, and a lack of readiness. The adoption of an e-government system at Muhimbili National Hospital began with the adoption of the Hospital Management Information System (HMIS), which was implemented at MNH-Mloganzila in 2018. It is the core system where Jeeva is integrated with different modules such as patient's registration, human resources management, payroll, finance, PMU, laboratory, pharmacy, etc. Also, there is a well-off system that is used in emergency medicine; there is a clear canvas, which is a medical imaging technology that provides economic storage and convenient access to images from multiple modalities (source machine type). Moreover, there is an e-scan antivirus for the protection of information assets. There is a nurse-calling system for easing communication between patients in wards, toilets, washrooms, and nurses at the nursing station. Also, there is a biometric attendance record system for monitoring and managing the attendance of staff. There is a telefax unit that is tasked with overseeing internal and external telecommunications. In general, the hospital is responsible for developing, operating, maintaining, and updating ICT infrastructure, local area networks, and the internet. The hospital is also responsible for maintaining and updating the hospital management information system and the hospital website (https://www.mloganzila.or.tz/ict). This study was conducted to assess whether the adoption of the e-government system facilitated effective service delivery at Muhimbili National Hospital.

1.1 Statement of the Problem

With the development of technology, the use of the Internet has become one of the most important means of communication in different spheres, including management and governance (Furuholt and Sæbø 2018). Tanzania has worked harder for some time to digitize government service delivery (Hamad, 2018). The government also developed an e-government strategy, set up an implementing institution, and initiated support. Successful implementation of e-government is associated with many things, such as transforming the culture of the worker to accept the new system of e-government to provide efficient and effective services (Hamad, 2018). Despite the efforts made by the government, the full realization of e-government has not been fully attained, and it is associated with challenges such as insufficient e-government facilitations such as personnel, facilities, and an enabling environment, which affect service delivery (Mandari & Koloseni, 2023).

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public sector make use of both legacy and automated processes, which discourages the performance of the e-government system (Mkwizu & Sichone, 2019). Moreover, there are challenges such as a lack of awareness of the value of e-government, especially among the public, insufficient management and political support, and a lack of readiness.

The implementation of the Hospital Management Information System (HMIS) at MNH-Mloganzila in 2018 marked the beginning of the adoption of the adoption of the e-government system at Muhimbili National Hospital. The core system is where Jeeva's various modules, including those for patient registration, payroll, finance, human resources management, PMU, lab, and pharmacy, are integrated. In addition, the well-off system, which is employed in emergency care, and the clear canvas medical imaging technology, which offers affordable storage and easy access to images from many modalities (source machine type), Additionally, an antivirus program called e-Scan is available to safeguard data assets.

To facilitate communication between patients, inwards, restrooms, and nurses at the nursing station, a nurse calling system is in place. A biometric attendance record system is also in place to track and manage personnel's attendance. The responsibility for managing both internal and external telecommunications falls on a telefax unit. Generally speaking, the hospital is in charge of creating, running, maintaining, and upgrading the local area network, internet, and ICT infrastructure. Along with upkeep of the hospital website (https://www.mloganzila.or.tz/ict), the hospital is also in charge of upgrading and maintaining the hospital management information system. The purpose of this study is to determine whether Muhimbili National Hospital's efficient service delivery was aided by the implementation of an e-government system.

1.2 Research Objectives
i. To determine the factors for the adoption of e-government at Muhimbili National Hospital.
ii. To examine the level of acceptance of e-government systems at Muhimbili National Hospital
iii. To determine the role of e-government in improving service delivery at Muhimbili National Hospital

1.3 Research Questions
This study intended to respond to the following research questions;
i. Why e – e-government system adopted at Muhimbili National Hospital?
ii. What is the level of acceptance of e-government use at Muhimbili National Hospital?
iii. What is the role of e-government in improving service delivery at Muhimbili National Hospital?

II. LITERATURE REVIEW

2.1 Theoretical Review
2.1.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), originally proposed by Davis (1989), provides a theoretical foundation for understanding the factors that influence the adoption and use of new technologies, including e-government systems. TAM posits that two primary factors determine an individual's intention to use a technology: Perceived Usefulness (PU): The degree to which a person believes that using a particular system would enhance their job performance. Perceived Ease of Use (PEOU): The degree to which a person believes that using a particular system would be free of effort. According to TAM, these two factors directly influence a person's attitude toward using the technology, which in turn affects their behavioral intention to use it and ultimately their actual use of the system. The model also suggests that PEOU has a direct effect on PU, as systems that are easier to use are generally perceived as more useful.

In the context of e-government adoption, TAM has been widely applied and extended to explain citizens' acceptance of online government services. For instance, Carter and Bélanger (2005) integrated TAM with elements of the Diffusion of Innovation theory to study e-government adoption, finding that perceived ease of use, compatibility, and trustworthiness were significant predictors of citizens' intention to use e-government services. The relevance of TAM to e-government research lies in its ability to explain the cognitive and affective factors that influence users' decisions to engage with new technologies. By understanding these factors, policymakers and system designers can develop more effective e-government initiatives that are perceived as both useful and easy to use by citizens.

Thus, the Technology Acceptance Model (TAM) is highly relevant to this study on e-government adoption and service delivery in Tanzania. TAM provides a theoretical framework for understanding the key factors influencing citizens' acceptance and use of e-government services, which is crucial for the successful implementation and adoption of these initiatives. The model's core constructs of perceived usefulness (PU) and perceived ease of use (PEOU) directly align with the study's objectives of examining the roles of e-government in service delivery and the challenges of implementation. By applying TAM, researchers can better understand why citizens may or may not adopt e-

government services, helping to identify potential barriers and enablers to adoption. Furthermore, TAM's focus on user perceptions aligns well with the study's emphasis on user acceptance and satisfaction with e-government services. The theory can help explain how factors such as website quality, system interactivity, and user characteristics influence citizens' intentions to use and continue using e-government services. This theoretical underpinning can guide policymakers and system designers in developing more effective, user-centric e-government initiatives that are perceived as both useful and easy to use, ultimately leading to improved service delivery and higher adoption rates in Tanzania.

2.2 Empirical Review
2.2.1 Adoption of E-Government Services

The adoption of e-government services is a crucial aspect of implementing successful e-government initiatives. Several studies have examined the factors that influence e-government adoption in various contexts, particularly in developing countries. In Tanzania, Magayane et al. (2016) conducted a comprehensive assessment of the current e-government implementation status, focusing on the websites of ministries and government agencies. Their study, which analyzed information from 51 websites, revealed a positive reception of e-government, with implementation primarily focused on establishing a digital presence and facilitating communication. The researchers noted significant advancements in service delivery and provision enabled by e-government in several Tanzanian ministries.

Sigwejo and Pather (2016) developed the e-government citizen satisfaction framework (ECSF) to understand and evaluate the effectiveness of e-government services in improving management practices. Their framework emphasizes the importance of aligning government and citizen perspectives to accurately assess e-government service effectiveness. The study's findings highlighted the need for closer monitoring and evaluation of all government ICT initiatives, indicating that e-government adoption is still not widespread and requires increased efforts from stakeholders to enhance adoption rates.

In a more recent study, Sichone and Mbamba (2021) investigated user perception and satisfaction with e-government service quality for tax procedures in Tanzania. They found that two aspects of e-government service quality—one-stop service and interactive service quality—positively influenced users' perceptions of their satisfaction with e-government. However, factors related to one-stop service were found to be insignificant. The study also indicated that concerns about system security negatively impacted user satisfaction, although this relationship was also found to be minor.

These studies collectively highlight the importance of user-centric approaches in e-government implementation and the need to address both technological and perceptual barriers to adoption. They also underscore the variability in adoption rates across different e-government services and the importance of tailoring strategies to specific service contexts.

2.2.2 Roles of E-Government in Service Delivery

E-government has been recognized as a powerful tool for improving public service delivery across various sectors. Several studies have examined the specific roles and impacts of e-government initiatives on service delivery efficiency and effectiveness.

Sadik-Zada et al. (2022) conducted a comprehensive analysis of the potential impact of electronic governance on combating small-scale corruption. Using two principal-agent models, they found that electronic government can effectively lower bureaucratic corruption, particularly in developing and transitional countries. Their research revealed a significant decrease in petty corruption in public sector service delivery following the adoption of e-government. Additionally, they identified negative correlations between bribery in public service delivery and factors such as per capita income, political rights, civil liberties, and the proportion of natural resources in gross exports.

Zaidi et al. (2012) focused on assessing e-government service quality from the citizen's perspective, proposing an e-GSQA framework specifically designed to evaluate e-tax services in India. Their study emphasized the importance of user-friendly websites in e-government service delivery and the need to understand how citizens perceive and evaluate online services. This research highlights the critical role of user experience in the success of e-government initiatives.

In the context of developing countries, Saddique (2016) examined the impact of e-government on service delivery in Bangladesh. The study found that, while e-government implementation has been slow overall, various e-initiatives have successfully transformed traditional administrative systems and practices. The research demonstrated how e-innovations have effectively addressed complex challenges, providing convenience and benefits to service users. A key finding was that although e-government has not yet revolutionized governance or service delivery, it has initiated a process of transformation.

Chukwuemeka et al. (2017) investigated the effect of e-government on service delivery in a Nigerian university context. Their findings indicated that e-government leads to significant improvements in service delivery through enhanced employee performance. The use of ICT in work-related tasks was found to reduce errors, delays, and wasted time, contributing to more efficient service delivery.

These studies collectively demonstrate the multifaceted role of e-government in improving service delivery, from reducing corruption and enhancing transparency to increasing operational efficiency and user satisfaction. They also highlight the transformative potential of e-government in reshaping public administration and citizen-government interactions.

2.2.3 Challenges of E-Government Implementation

While e-government offers numerous benefits, its implementation, particularly in developing countries, faces several challenges. Understanding these challenges is crucial for developing effective strategies to overcome them and maximize the potential of e-government initiatives.

Yusuf and Xiaoyun (2016) examined the challenges of implementing e-government in developing countries, with a focus on Tanzania. Their study identified organizational and legal issues as the primary barriers to e-government implementation in developing nations. They recommended that developing countries provide adequate funding to information and communication departments to support policy implementation, system upgrades, and training to overcome these obstacles.

Weerakkody et al. (2019) investigated the challenges in information creation and sharing between stakeholders in e-government service chains. Their case study of local government authorities (LGAs) found that the diversity of stakeholders involved and the lack of appropriate channels for information sharing and collaboration were the main barriers to effective municipal e-government service delivery.

Osei-Kojo (2017) studied the relationship between e-government and public service quality in Ghana. While confirming the potential of e-government to improve public service delivery by increasing productivity, reducing costs, expanding service accessibility, and improving customer satisfaction, the study identified several challenges hindering the full realization of e-government benefits. These challenges included illiteracy, intermittent power outages, and inadequate ICT infrastructure, especially in towns and villages.

In the Tanzanian context, Kamatula and Kemoni (2018) found that while government institutions were using e-records, they were not adequately prepared or effective in supporting e-government initiatives. Their research revealed insufficient and ineffective laws, guidelines, and policies regarding e-records management and e-government implementation. Additionally, they identified a lack of necessary skills in e-records management and related technologies among action officers, IT staff, and records management personnel.

Charles (2020) assessed the barriers to e-government initiative adoption in Tanzania's public sector. The study highlighted a lack of IT skills as a major obstacle to the successful implementation of e-government programs in public services. Respondents also emphasized issues with reliable networks and communication tools as persistent challenges hindering the achievement of e-government projects. The research also stressed how the IT policy posed a problem for the public sector's ability to successfully execute e-government efforts.

Kisoka (2020) examined the factors influencing Tanzanians' utilization of e-government services, focusing on the National Examinations Council of Tanzania (NECTA). The study identified several challenges, including inadequate funding, a shortage of ICT specialists and equipment, unstable networks and electricity, and outdated technology. The research concluded that addressing funding issues should be prioritized, as it is the root cause of many other problems.

These studies collectively highlight the multifaceted nature of the challenges facing e-government implementation, particularly in developing countries. They emphasize the need for comprehensive strategies that address not only technological issues but also organizational, legal, and human resource challenges to ensure successful e-government adoption and service delivery.

2.2.4 User Acceptance and Satisfaction with E-Government Services

User acceptance and satisfaction are critical factors in the success of e-government initiatives. Several studies have explored these aspects in various contexts, providing insights into the determinants of user satisfaction and continued use of e-government services.

Shuib et al. (2019) investigated the factors affecting Malaysian citizens' adoption of e-government. Their analysis revealed that compatibility, relative advantage, image, level of trust in the government, computer self-efficacy, and user experience significantly influence the frequency of e-government application use. The study also showed that user satisfaction with e-government services was significantly impacted by the adoption of e-government applications.

Almaiah and Nasereddin (2020) examined potential factors influencing Jordanians' adoption of e-government services. Their findings indicated that website quality, online trust, government trust, performance expectancy, effort expectancy, and facilitating conditions positively influenced the intention to use e-government services. The study also found that website quality positively influenced the performance expectancy of e-government services.

In the Tanzanian context, Mandari and Koloseni (2023) examined the factors influencing citizens' intentions to continue using e-government services and the moderating effects of system interaction. Their results showed that system interactivity, computer self-efficacy, management support, confirmation, satisfaction, and perceived usefulness all positively and significantly influence users' intention to continue using e-government services. The study also demonstrated that system interactivity moderates the influence of perceived usefulness and satisfaction on the intention to continue using these services.

Kagoya and Mbamba (2021) focused on evaluating the user engagement approach to e-government implementation in Tanzania. Their study revealed a strong correlation between e-government adoption success, top management support, and user characteristics. However, they found that information system characteristics and information and communication technology infrastructure were not significant factors in this context.

These studies collectively highlight the importance of user-centric approaches in e-government implementation. They emphasize the need to consider various factors, including technological aspects (e.g., website quality, system interactivity), user characteristics (e.g., computer self-efficacy), and institutional factors (e.g., trust in government, management support) in designing and implementing e-government services. The findings underscore the complex interplay of factors influencing user acceptance and satisfaction with e-government services and the need for holistic strategies to enhance user engagement and continued use of these services.

III. METHODOLOGY

3.1 Research Approach

The study employed a mixed research approach, as the research approach encompasses both quantitative and qualitative approaches in a single study. Under this approach, the research collects and analyses numerical and non-numerical data. Quantitative data for this study was obtained through questionnaires, while qualitative data was obtained through interviews and documentary reviews.

3.2 Research Design

In this study, the researcher employed a case research study. A case study research design enabled the researcher to study a single element from different angles. The research studies the role of e-government in effective service delivery at MRH.

3.3 Target Population

Muhimbili National Hospital (MNH) has 2700 employee of which 300 are doctors and specialists, 900 registered and enrolled nurses and the 1500 supporting operation employees. It is organized into seven directorates which are clinical services, Nursing services and quality, clinical support services, human resources, finance and planning, technical services and information and communication technology, thus it has 25 departments and 106 units. Also, MNH attends 1,000 outpatients per week while admitting 1,200 inpatients per week. Therefore, the population of this study was 4900 (https://www.mnh.or.tz/index.php/about-us).

3.4 Sample Size

In this study, the sample size is obtained by using Yamane (1967) Formula for calculating sample size, which provides as follows (as cited in Kothari, 2004, p. 59);

$$n = \frac{N}{1 + N\,(e)2}$$

Whereby

N = population, n = sample size, e = coefficient level

Given

N = 425

n =?

e = 0.5

$$n = \frac{4900}{1 + 4900(0.05)2}$$

$$n = \frac{4900}{13.2.5}$$

n = 369

Therefore, the sample size of this study was 369 respondents

Table 1

Sample Size Distribution

Category	Population	Sample	Percentage
Supporting Operation	1500	102	27.6
Doctors and Specialists	300	60	16.3
Registered and enrolled nurses	900	83	22.5
Patients attending services	2200	124	33.6
Total	4900	369	100

3.5 Data Collection Methods

In this study, the researcher employed both primary and secondary data collection methods which are described as follows.

3.6 Data Analysis Method

Quantitative data were analyzed by using SPSS software through descriptive to obtain frequencies and percentages and presentation of tables. All the field questionnaires were properly and carefully scrutinized and coded in tabular and numerical terms for easy analysis. Editing of data involved the examination of collected raw data to detect errors and omissions.

IV. FINDINGS & DISCUSSIONS

This section presents the analysis of data, findings, and discussion of the major results regarding the roles of e-government in effective service delivery in the health sector, using Muhimbili National Hospital as a case study. The findings are organized according to the research objectives, which were: to determine the factors influencing the adoption of e-government at Muhimbili National Hospital; to examine the level of acceptance of the e-government system at Muhimbili National Hospital; and to determine the roles of e-government in service delivery at Muhimbili National Hospital. The chapter also examines the relationships between variables as outlined in the conceptual framework, focusing on the independent variables of Perceived Usefulness (PU), Perceived Ease of Use (PEU), Attitude toward Use (ATU), and Behavioral Intention to Use (BIU), and the dependent variable of Service Delivery (SD).

4.1 Demographic Characteristics of the Respondents

This section presents the demographic characteristics of the respondents who participated in this study. In this section the researcher assessed the characteristics such as age, gender, level of education, occupation and working experience and the results obtained were summarized and presented in Table 2 as follows.

Table 2
Demographic Characteristics of the Respondents

Characteristic	Category	Frequency	Percent
Gender	Male	186	66.0
	Female	96	34.0
	Total	**282**	**100**
Age	18 - 28 Years	115	40.8
	29 - 39 Years	49	17.4
	40 – 50 years	69	24.5
	51+ years	49	17.4
	Total	**282**	**100**
Level of education	Masters	46	16.3
	Bachelor degree	23	33.7
	Diploma	23	8.2
	Certificate	72	25.5
	Technical Education	46	16.4
	Total	**282**	**100**
Occupation	Doctor	45	16.0
	Specialist	49	17.4
	Nurse	60	21.3
	System support operation	46	16.3
	Patient	82	29.1
	Total	**282**	**100**
Working experience	1 – 5 years	92	32.6
	6 – 10 years	118	41.8
	11+ years	72	25.5
	Total	**282**	**100**

Table 2 shows that 66.0 % of the respondents who participate in this study were male, 34.0% percent of the respondents who participated in this study were female. Thus, it can be established that most of the respondents in this study were male compared to female. The essence of assessing the gender of the respondents was to ensure that the study is not gender biased. Thus, despite of the difference of the rate of response between male and female respondents still the researcher managed to include both genders in the study. Also shows that 40.8% of the respondents aged between 18 – 28 years, also 17.4 % of the respondents aged between 29 – 39 years, while 24.5% of the respondents aged between 40 – 50 years while 17.4% of the respondents aged 51 years and above. From this study it can be established that most of the respondents who participated in this study had the age between 18 – 28 years, however other categories also had effective participation in the data collection process. The researcher determined the age of the respondents because so as to ensure that respondents in different age groups are represented. On the level of education 16.3% of the respondents had master degree, 33.7% of the respondents had bachelor degree, on the other hand 8.2% of the respondents had diploma, while 25.5% of the respondents and lastly 16.4% of the respondents had technical education. Therefore, it can be established that most of the respondents who participated in this study are educated and they could provide a reasoned opinion in relation to the roles of e-government on effective service delivery. The results also16.0% of the respondents were doctors, 17.4% were specialists, 21.3% of the respondents were nurses. On the other hand, the study also had 21.3% of the respondents were from system support and operation department while 29.1% of the respondents were patients who attends various services at Muhimbili national hospital. The researcher consulted these respondents because in realizing the effectiveness of e-government on service delivery these were the key players and so were successfully included in the research study. Lastly on the working experience of the respondents it was noted that 32.6% of the respondents had the experience of between 1 – 5 years, also 41.8% of the respondents had the experience of between 6 – 10 years. On the other hand, 25.5% of the respondents had the experience of 11 years and above. Form the experience of the respondents it can be concluded all the respondents have been good exposure to the e-government system and so they can provide an important insight on its effectiveness in services delivery.

4.2 Factors Influencing the Adoption of E-government

The first research objective was to determine the factors influencing the adoption of e-government at Muhimbili National Hospital. This aligns with the independent variables of Perceived Usefulness (PU) and Perceived Ease of Use (PEU) from the conceptual framework.

Table 3

Factors Influencing E-government Adoption

Factor	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Easy to use	27.7%	52.5%	3.2%	10.3%	6.4%
Provides information security	33.7%	49.6%	0%	16.7%	0%
Useful for hospital information management	39.4%	54.3%	6.4%	0%	0%
Influenced by social factors	43.6%	56.4%	0%	0%	0%
Requires little effort to use	32.6%	67.4%	0%	0%	0%
Has facilitating conditions for use	52.8%	47.2%	0%	0%	0%

4.3 Factors Influencing the Adoption of E-government

The analysis of factors influencing e-government adoption reveals strong agreement on several key aspects, particularly those related to Perceived Ease of Use (PEU) and Perceived Usefulness (PU). The high level of agreement (80.2%) that e-government is easy to use for anyone indicates that the system implemented at Muhimbili National Hospital has been designed with user-friendliness in mind. This ease of use is crucial for the successful adoption of any new technology, as it reduces the learning curve and minimizes resistance to change among users.

The unanimous agreement (100%) that e-government requires little effort to use and that there are facilitating conditions for its use further reinforces the perception of the system's accessibility. This finding suggests that the hospital has not only implemented a user-friendly system but has also provided adequate support structures to assist users in adopting and utilizing the e-government tools. The presence of facilitating conditions is particularly important in a healthcare setting, where staff may have limited time to learn new systems due to the demanding nature of their work.

In terms of perceived usefulness, the high agreement (93.7%) that e-government is useful for hospital information management indicates a strong recognition of the system's benefits among users. This perception of usefulness is critical for driving adoption, as users are more likely to embrace a system they believe will improve their work processes and outcomes. The fact that 83.3% of respondents agreed that the system provides security for collected information is also significant, especially in the context of healthcare, where patient data confidentiality is paramount.

The unanimous agreement on the role of social influence in e-government adoption highlights the importance of organizational culture and peer attitudes in technology acceptance. This finding suggests that the hospital's leadership and early adopters may have played a crucial role in promoting the use of e-government systems among their colleagues.

Qualitative insights from interviews provided valuable context for these quantitative findings. The complex interplay of technological, organizational, and societal factors in e-government implementation, as noted by Participant 1, underscores the multifaceted nature of technology adoption in healthcare settings. The emphasis on reliable IT infrastructure, supportive regulatory frameworks, strong cybersecurity measures, and adequate staff training programs points to the need for a holistic approach to e-government implementation.

The importance of sufficient funding and stakeholder engagement emerged as critical themes in the qualitative data. These factors highlight the need for sustained organizational commitment and inclusive decision-making processes for the successful adoption of e-government systems. The alignment between the quantitative and qualitative findings strengthens the validity of the results and provides a nuanced understanding of the factors driving e-government adoption at Muhimbili National Hospital.

4.4 Level of Acceptance of E-government System

The second research objective examined the level of acceptance of the e-government system, aligning with the Attitude Toward Use (ATU) and Behavioral Intention to Use (BIU) variables from the conceptual framework.

Table 4

Level of Acceptance of E-government System

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Accepted by patients	21.3%	56.0%	0.4%	11.7%	10.6%
Accepted by doctors and nurses	28.4%	56.4%	4.3%	7.8%	3.2%
Facilitates hospital management control	43.3%	52.1%	3.2%	1.4%	0%
Secures patient information	26.2%	51.1%	2.1%	7.4%	13.1%
Links all service-providing departments	28.4%	41.8%	8.5%	8.2%	13.1%
Enables easy performance tracing	36.9%	42.6%	3.9%	11.7%	5.0%

The examination of the level of acceptance of the e-government system reveals generally high levels of acceptance across different stakeholder groups, aligning with the Attitude Toward Use (ATU) and Behavioral Intention to Use (BIU) variables from the conceptual framework.

The high level of acceptance among patients (77.3% agreement) is particularly noteworthy, as it suggests that the e-government system has successfully addressed the needs and expectations of the end-users of healthcare services. This acceptance by patients is crucial for the overall success of the system, as it can lead to increased utilization of e-government services, potentially reducing administrative burdens and improving patient engagement in their own healthcare.

The even higher acceptance rate among doctors and nurses (84.8% agreement) is a positive indicator of the system's integration into clinical workflows. This acceptance by healthcare professionals is essential for the effective implementation of e-government in a hospital setting, as these are the primary users who will interact with the system on a daily basis. Their positive attitude suggests that the system is perceived as a valuable tool in their professional practice rather than an additional burden.

The near-unanimous agreement (95.4%) that the system facilitates hospital management control indicates that e-government has successfully addressed administrative needs as well. This high level of acceptance among management staff suggests that the system provides valuable tools for oversight, decision-making, and resource allocation, which are critical for efficient hospital operations.

The strong agreement on the system's role in securing patient information (77.3%), linking service-providing departments (70.2%), and enabling easy performance tracing (79.5%) demonstrates a high level of trust in the system's capabilities. These findings indicate that users not only accept the system but also recognize its value in addressing key challenges in healthcare delivery, such as data security, interdepartmental coordination, and performance monitoring.

Qualitative data from interviews provided additional context to these high acceptance levels. The emphasis on addressing implementation challenges, continuous system improvement, and commitment to technological advancement suggests that the hospital's approach to e-government has been dynamic and responsive to user needs. This ongoing support and development are likely key factors in maintaining the high levels of acceptance observed in the quantitative data.

The high acceptance levels across different aspects of the e-government system suggest that it has been well-integrated into the hospital's operations and culture. This successful integration is likely the result of careful planning, stakeholder engagement, and responsive implementation strategies. The alignment between the system's capabilities and the needs of various user groups has fostered a positive attitude toward the technology, which is crucial for its continued use and effectiveness in improving service delivery.

4.5 Roles of E-government in Service Delivery

The third research objective focused on determining the roles of e-government in service delivery at Muhimbili National Hospital, directly addressing the dependent variable of Service Delivery (SD) from the conceptual framework.

Table 5

Roles of E-government in Service Delivery

Role	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Reduced waiting times	25.5%	50.7%	2.1%	11.0%	10.6%
Faster transactions	33.3%	51.8%	5.3%	5.0%	4.6%
Improved patient record management	41.1%	49.6%	2.8%	2.8%	3.5%
Simplified doctor allocation	31.2%	57.8%	2.5%	3.9%	4.6%
Timely administration of medicines	42.9%	46.5%	2.1%	3.5%	5.0%
Improved link with insurance services	31.9%	42.9%	3.9%	12.1%	9.2%

The analysis of the roles of e-government in service delivery at Muhimbili National Hospital reveals significant positive impacts across various aspects of healthcare provision. These findings directly address the dependent variable of Service Delivery (SD) from the conceptual framework and provide concrete evidence of the benefits of e-government implementation in a healthcare setting.

The improvement in efficiency and speed of service delivery is evident from the high agreement rates on reduced waiting times (76.2%) and faster transactions (85.1%). These findings suggest that the e-government system has successfully streamlined administrative processes, leading to more efficient patient flow and reduced bureaucratic

delays. In a healthcare context, where timely service can be crucial for patient outcomes, these improvements in efficiency are particularly significant.

The impact of e-government on patient care is particularly noteworthy. The very high agreement rates on improved patient record management (90.7%), simplified doctor allocation (89%), and timely administration of medicines (89.4%) indicate that the system has successfully addressed core aspects of healthcare delivery. Improved record management can lead to better continuity of care, reduced medical errors, and more informed decision-making by healthcare providers. The simplified allocation of doctors to patients suggests more efficient use of medical resources, potentially leading to improved access to care. Timely administration of medicines is crucial for patient safety and treatment efficacy, and the high agreement on this point indicates that the e-government system has successfully supported this critical aspect of patient care.

The role of e-government in integrating services, as evidenced by the improved links with insurance services (74.8% agreement), demonstrates the system's capacity to enhance the broader healthcare ecosystem. This integration can lead to smoother billing processes, reduced administrative burden for patients, and potentially improved access to care through streamlined insurance verifications.

Qualitative insights from interviews provided rich context to these quantitative findings. The emphasis on enhanced accessibility and convenience for patients highlights the patient-centric benefits of e-government implementation. The ability for patients to access healthcare information and services remotely represents a significant shift in healthcare delivery, potentially improving access to care and patient engagement.

The qualitative data also highlighted the role of e-government in improving health information management through electronic health records. This aligns with the quantitative findings on improved patient record management and underscores the system's role in enhancing the quality and accessibility of patient information.

The themes of simplified appointment scheduling, improved communication channels, and integration of online payment systems that emerged from the qualitative data provide additional dimensions to the understanding of e-government's role in service delivery. These aspects contribute to a more comprehensive and integrated healthcare experience for patients, potentially leading to improved satisfaction and health outcomes.

The emphasis on enhanced accountability and transparency in healthcare operations that emerged from the qualitative data is particularly significant. While this aspect was not directly measured in the quantitative survey, it represents an important additional benefit of e-government implementation. Improved transparency can lead to better resource allocation, reduced corruption, and increased public trust in healthcare institutions.

In summary, the findings on the roles of e-government in service delivery at Muhimbili National Hospital paint a picture of a system that has successfully addressed multiple aspects of healthcare provision. From improving operational efficiency to enhancing patient care and integrating services, the e-government system appears to have made significant contributions to the quality and effectiveness of healthcare delivery at the hospital.

4.6 Relationship between E-government Adoption and Service Delivery

The correlation and regression analyses provide valuable insights into the relationships between the various aspects of e-government adoption and service delivery at Muhimbili National Hospital. These analyses help to quantify the impact of the independent variables (PU, PEU, ATT, BIU) on the dependent variable (SD) and provide a statistical basis for understanding the factors that drive improvements in service delivery through e-government implementation.4.6.1 Correlation Analysis

Table 6

Correlation Analysis Results

Variable	SD	PU	PEU	ATT	BIU
Service Delivery (SD)	1				
Perceived Usefulness (PU)	.303**	1			
Perceived Ease of Use (PEU)	.336**	.213**	1		
Attitude Toward Use (ATT)	.834**	.301**	.349**	1	
Behavioral Intention to Use (BIU)	.607**	.288**	.208**	.571**	1

** Correlation is significant at the 0.01 level (2-tailed)

The correlation analysis reveals significant positive relationships between all variables, with particularly strong correlations between Service Delivery (SD) and Attitude Toward Use (ATT) (.834) and Behavioral Intention to Use (BIU) (.607). These strong correlations suggest that positive attitudes toward the e-government system and intentions to use it are closely linked with improvements in service delivery. This finding underscores the importance of not only implementing technological solutions but also fostering positive perceptions and intentions among users.

The moderate positive correlations between Service Delivery and Perceived Usefulness (.303) and Perceived Ease of Use (.336) indicate that these factors also play a role in improving service delivery, albeit to a lesser extent than attitudes and intentions. This suggests that while the technical aspects of the system (its usefulness and ease of use) are important, the psychological factors (attitudes and intentions) may have a more direct impact on service delivery outcomes

4.6.2 Regression Analysis

A multiple regression analysis was conducted to determine the predictive power of the independent variables on service delivery.

Table 7
Regression Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.874	.764	.761	.639

The regression analysis provides further insights into the predictive power of these variables on service delivery. The high R Square value of .764 indicates that the model explains 76.4% of the variance in service delivery, which is a strong predictive relationship. This suggests that the chosen independent variables (PU, PEU, ATT, BIU) are indeed key factors in determining the effectiveness of e-government in improving service delivery.

Table 8
ANOVA Results

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	367.014	4	91.753	24.522	.000
Residual	113.199	277	.409		
Total	480.213	281			

The ANOVA results confirm the statistical significance of the model ($F = 24.522$, $p < .001$), providing confidence in the overall validity of the regression analysis. This signifies that the combination of independent variables has a significant effect on service delivery, rather than the observed relationships being due to chance.

Table 9
Regression Coefficients

Model	B	Std. Error	Beta	t	Sig.
(Constant)	.174	.111		1.571	.117
PU	.021	.028	.023	.747	.001
PEU	.033	.030	.035	1.112	.002
ATT	.748	.037	.758	20.380	.000
BIU	.136	.032	.153	4.296	.000

Examining the individual regression coefficients, we see that all independent variables are statistically significant predictors of service delivery ($p < .05$). Attitude Toward Use (ATT) has the strongest effect (Beta = .758), followed by Behavioral Intention to Use (BIU) (Beta = .153). This aligns with the correlation analysis and further emphasizes the crucial role of user attitudes and intentions in driving improvements in service delivery.

Perceived Usefulness (PU) and Perceived Ease of Use (PEU) have smaller but still significant effects on service delivery. This suggests that while the technical aspects of the system are important, their impact on service delivery may be partially mediated through their influence on attitudes and intentions.

The regression equation (SD = .174 + 0.021PU + 0.033PEU + 0.748ATT + 0.136BIU) provides a predictive model for service delivery based on these factors. This equation could potentially be used by hospital management to estimate the impact of improvements in various aspects of e-government adoption on overall service delivery.

During the interview respondents had various perceptions as follows; at organizations like Muhimbili National Hospital (MNH), e-government, or electronic government, is essential to improving service delivery since it uses technology to promote efficiency, improve communication, and simplify procedures.
Onee of the participants pinpointed as following;

> *"…….. e-government system has enhanced accessibility and convenience whereby patients may obtain healthcare information and services remotely thanks to e-government systems. Without physically visiting the hospital, patients may make appointments, check test results, and contact with healthcare*

> *practitioners via mobile applications and web portals. Patients benefit from this accessibility, especially those who might have transportation or location-related issues….* [Participant No. 01, 2024].

Another participant pinpointed that

> *"…..Effective Health Information Management: EHRs, or electronic health records, are essential for keeping patient data current and correct. At MNH, e-government solutions can aid in centralizing and digitizing medical records, facilitating easy access to patient data by authorized staff. This guarantees that medical professionals have access to complete and up-to-date data, resulting in more informed choices and better patient care…..* [Participant No. 03]

Moreover, it was noted that

> *"……Simplified Appointment Scheduling and Queue Management: E-government applications can help with the effective scheduling of appointments, cutting down on wait times and administrative work. Systems for digital queue management can be used to enhance patient flow inside the hospital, guaranteeing prompt and well-organized service delivery. Also, it has enhanced improved channels of contact because e-government systems offer efficient means of contact for patients, healthcare professionals, and other stakeholders. This involves providing real-time information on medical operations, health education materials, and automated appointment reminders. A greater comprehension of healthcare procedures is fostered by improved communication, which raises patient satisfaction…..."* [Participant No. 04, 2024]

It was observed from another participant that;

> *"…..e-government is useful because it is integrated into online payment and billing services since online payment and billing services can be integrated through the use of e-government technologies. Through safe online channels, patients may read invoices, make payments, and obtain financial information. This simplifies financial processes for the hospital while simultaneously improving patient convenience………* [Participant, No 06, 204]

Lastly, one of the participants opined that;

> *"…..enhanced accountability and transparency; by giving interested parties access to pertinent data, e-governance technologies enhance transparency. Because of this transparency, the healthcare system is more accountable, which guarantees that operations are carried out smoothly and that resources are used wisely….* [Participant, No 01, 2024].

Based on these findings it can be established that the level of acceptance of e-government initiative at Muhimbili National Hospital is relatively higher because the system has been successfully implemented and operating effectively in the provision of services to patients. The system also has been accepted by staff members and the administration because it has eased the management of the hospital. In conclusion, Muhimbili National Hospital's successful adoption of e-government programs can result in a healthcare system that is more patient-centric, effective, and transparent. Through the use of technology, MNH can improve communication, increase the quality of services it provides, and ultimately help the community it serves achieve better health outcomes.

4.7 Discussions

In this study the researcher aimed to determine the roles of the e-government on service delivery and the results obtained showed that the determinants on the role of e-government on services delivery at Muhimbili National Hospital had overall mean equals to 3 and standard equals to 1. This means that most of the respondents who participated in this study agrees that e-government has roles to play on services delivery at Muhimbili National Hospital, this is also supported by Sichone and Mbamba (2021) who found that a construct for fear of system security matters harmed user satisfaction as proposed, unfortunately, it was insignificant, therefore the study provides important insights on e-government services quality for several stakeholders including public administrators for the proper improvement of public electronic operations.

Kagoya and Mbamba (2021), also e-government success using user-participation attributes, top management support, ICT infrastructure and IS attributes. Findings revealed that user-attributes and top management support were significantly related to e-government implementation success and Information and Communication Technology Infrastructure-attributes and Information System-attributes were insignificant. On the other hand, Mwilongo and Kachita (2023) revealed that factors related to infrastructures, technology, human capital, policy, practitioners and partnerships among others were identified to hinder the delivery of e-government services to the public and brought adverse effects on e-government performance for economic development.

The roles of e-government on service delivery are also substantiated by authors such as Sadik-Zada, et al (2022) who revealed that e-government presents one of the utmost opportunities for socio-economic development and offers solutions for the improvement of the efficiency and effectiveness of public administration. Also, Zaidi et al (2012) opines that e-government is a critical element of the assessment of e-governmental services is the development

of user-friendly web sites. To deliver advanced quality of services it becomes important to understand how citizens sight and assess online services. On the other hand, Saddique (2016), demonstrate the ways in which various e-initiatives have transformed traditional administrative systems and practices, notwithstanding the nation's limited overall e-development. It also shows how e-innovations have helped tackle some complex challenges, thereby adding to convenience and benefits to service users. Lastly Chukwuemeka et al (2017) revealed among other things that e-government has strong positive effect on service delivery by enhancing the performance of workers.

The government of the united republic of Tanzania has long recognized the importance of applying information and communication technology (ICT) in enhancing work efficiency and services delivery to the public (Sæbø, 2012). This has driven the need to couple ICT with government administration to deliver services to citizens, business and other government agencies while enhancing its administrative effectiveness (Kamatula & Kemoni 2018). The emergence of e-government has allowed government to reap the benefits of digital transformation in reshaping the public sectors. System and services implemented under various e-government initiatives have been instrumental in providing convenient access to government services (Lupilya & Jung, 2015). This has largely been contributed by the Tanzania e-government strategy 2013 (Mkude & Wimmer, 2015). The strategy which expired in 2018 provided a more coordinated and citizen – driven focus for the Tanzania's e-government initiative and therefore brought services closer to citizens through an organized and holistic adoption of ICT. Elisa (2020) pinpoints that e-government envisions a digital government that is more interconnected, integrated and coordinated of the efficient delivery of public services. It sets up ambitions and specific goals and objectives whose achievements will not only result in the delivery of better services to a significantly larger population, but also in increased transparency and cost savings in delivery of services (Kagoya & Mbamba, 2021). Also according to Hamad (2018) the government will ensure that the objectives of this strategy are attained towards its commitment in improving service delivery, enhancing transparency and greater accountability to the public. Meanwhile, Elisa (2020) suggests that the e-government agency was transformed into a fully -fledged and strengthened e-government authority in 2019 with responsibility for coordination, overseeing and promotion of e-government initiative and enforcement of e-government policies, laws, regulations, standard and guidelines (Elisa, 2020). Lastly there was development and operationalization of key sectoral system including; the government electronic payment gateway GePG at the MoFT; and Government of Tanzania Health Operation Management Information system (GoTHOMIS) implemented in the government hospitals in Tanzania (Adaba et al 2022).

Moreover, the results obtained through regression analysis shows that there a positive and significant relationship between adoption of e-government and effective service delivery. The effectiveness of e-government on effective service delivery is substantiated by Ngonzi and Sewchurran (2019) who revealed that e-Government is a tool for the realization and strengthening of good governance processes. With such relevance in the background, there is always a gap for contribution in the context of technology and society relationships, through investigation of areas for implementation, improvement, or effective practice of e-government. In the implementation of e-government, Tanzania is said to be evolving through the digital presence-interaction–transaction–transformation stages of e-government maturity models (eGMMs). On the other Verkijika and De Wet (2018) show that the average usability scores for the websites was 36.2%, with the most usable website having a score of only 64.8%. The study also showed that the usability of e-government websites was positively associated with the E-Government Development Index (EGDI) and the E-Participation Index (EPI), while Matsieli and Sooryamoorthy (2021) indicate that the ministerial websites of the Government of Lesotho are falling short in addressing these issues. The evaluation results highlight that the web information and features that are key in fostering accessibility, usability, transparency and interactivity of government services are insufficient or completely non-existent in the ministerial sites.

In a study by Yusuf and Xiaoyun (2016), the factors analyzed include legal, cultural, managerial, organizational and technological awareness. The results indicate organizational and legal factors as the major impediments to the adoption of E-Government by developing countries such as Tanzania. Weerakkody et, al (2019), found that the diversity of stakeholders involved and the lack of appropriate mechanisms for information exchange and collaboration are posing the biggest challenges for efficient local e-government service delivery, meanwhile Simonofski et, al (2017), determine avenues for further research in this area about the following research themes: stakeholders involved, organizational and motivational pre-conditions, participation methods and outcomes of participation and also previous studies have demonstrated, this study also affirms the potential of e-government in improving public service delivery by increasing efficiency, reducing the cost of operations, expanding access to services, and achieving customer satisfaction.

Therefore, from the general findings of this study it was established that e-government systems adopted and implemented at Muhimbili National Hospital has a role to play in enhancing effective service delivery. It was also established that the system is highly acceptable by different users such as patients, services provider such as doctors and nurses. But also it was noted that this study is useful because it allows simplified monitoring process while offering system support operation officers minimal intervention since every aspect of the system is digitally organized

and systematically controlled hence reduces the likelihood of human errors in the operation and this guarantee highest level of satisfaction.

V. CONCLUSIONS & RECOMMENDATIONS

5.1 Conclusions

The general objective of this study was to assess the roles of e-government in effective service delivery at Muhimbili National Hospital in Tanzania. The general research findings revealed that the implementation of e-government plays an important role in enhancing the provision of health services effectively and efficiently for the following reasons. Firstly, e-government initiatives have facilitated easier access to healthcare services for patients. Online portal appointment scheduling systems and electronic health record enables individuals to access and manage their health information conveniently. This enhances the timeliness of service delivery by reducing waiting times and streamlining administrative processes. E-government also has enhanced communication and collaboration between departments at Muhimbili National Hospital since the tools used in e-government foster an improved communication channel between healthcare professionals, administrative staff and patients.

Electronic communication platforms and information–sharing systems contribute to better coordination of care, reducing the likelihood of errors and ensuring a seamless flow of information, this collaboration is vital for effective and holistic patient care. The results obtained from this study also revealed that e-government initiatives had prompted transparency in healthcare operations. Since patients are at the advantage of accessing their treatment plan. Additionally, the electronic system helps in monitoring and evaluating the performance of hospital staff, fostering a culture of accountability and continuous improvement.

Therefore, from the general findings of this study, it can be concluded that the adoption of e-government at Muhimbili National Hospital in Tanzania has positively transformed the healthcare landscape. From improved accessibility and communication to efficient resource management and data-driven decisions, these initiatives have collectively contributed to a more effective and patient-centric healthcare service delivery model.

5.2 Recommendations

This study recommends that research should be conducted on impacts assessment to measure the tangible impacts of e-government implementation by evaluating key performance indicators such as patient satisfaction, waiting times, cost savings and overall operational efficiency to quantify the benefits derived from the e-government systems. The study also recommends that there to enhanced cybersecurity evaluation to identify potential vulnerabilities in the e-government infrastructure. Implement numerous security measures to safeguard patient information and maintain the trust of stakeholders in the system.

The study also recommends training and capacity building to enhance skills in utilizing the e-government system effectively. Address any gaps in knowledge or skill to ensure that all people can maximize the benefit of the technology in their respective roles.

The study also recommends continuous monitoring and evaluation to establish a framework for continuous monitoring and evaluation of the e-government system. Regularly assess performance, address emerging issues and incorporate user feedback to ensure that the technology remains aligned with the hospital's evolving needs and goals.

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