

## A COMPREHENSIVE REVIEW ON INFORMATION TECHNOLOGY AND SERVICE DELIVERY: SIERRA LEONE GOVERNMENT HOSPITAL, KENEMA

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### Abstract

The review's objective was to assess how healthy information technology and service delivery are utilized at Kenema Government Hospital, one of Sierra Leone's public hospitals. For the study, there was a 100% response rate. Each participant received one of the study's 40 questionnaires in total. The questionnaires included inquiries aligned with the study's objectives (I. Massaquoi & A. Abu, 2022).

Kenema Government Hospital does not make use of information and communication technologies. Management at the hospital should do everything possible to expand the institution's information and communication resources. To help hospitals perform their duties more effectively, the government and other development partners should make some of this technology accessible.

To avoid paying for specialists, the Kenema Government Hospital administration might provide staff members with scholarships or training in computer technology. The government or other developing partners might work to secure funding for hospitals to use information and communication technologies rather than flying seriously ill people to other nations for treatment.

Thirty respondents claim that the most significant barrier to using information technology is the high implementation costs. At the same time, another Thirty says that a key obstacle is a

lack of necessary knowledge. Ten respondents noted a funding issue, and four added a problem with the caliber of the electrical supply. This has demonstrated that despite the advantages of information technology, difficulties still arise for both clients and staff.

It highlights how the usage of information technology at Kenema Government Hospital is built on the principle of providing services. To put it another way, not all services demand the application of technology. Information technology tools are not required for service delivery, such as vaccination in Kenema Government Hospital. Furthermore, some services—such as those for children with illness—may not always require the use of information technology tools, whereas others—like those for surgery, diabetic care, specialized services, and diagnostic services—do.

**Keywords:** Technology, Information, Laboratory, X-ray, Radiology, Government, Hospital, etc.

### 1.0 Introduction

Hospitals started investing in health information technology in the 1960s, according to (I. Massaquoi and A. Abu, 2022). Information technology was initially only employed to assist banking and billing services. In the future, information technology will manage service lines for radiology, laboratories, and pharmacies (Collen, 1995). And their main goal was to facilitate billing and collect money (commonly referred to as

charge capture). These programs started as simple clinical activity support and monitoring tools. These systems widely offered services like managing pharmacies' and laboratories' processes and documenting patients' radiological histories. By 2000, these systems were almost universal (McCullough, 2008).

The automation of clinical services has dramatically increased with the development of EMR systems. The electronic medical record (EMR) plans replaced a hospital's paper medical records and incorporated clinical data from auxiliary services like pharmacy, radiology, and laboratory. Since more advanced technologies enable doctors to access the electronic medical form and enter orders online directly. Computerized Providers Order Entry (CPOE) aims to improve communication and serve as a platform for automated treatment guidelines. Although premier academic medical institutes have developed these technologies for many years, they have only recently spread widely (I. Massaquoi and A. Abu, 2022).

The three mechanisms for hospitals to benefit from information technology are billing management, provider monitoring, and clinical decision support. While improved billing may be the most noticeable result of hospital information technology investments, hospitals offer a wide range of services, and the prices depend on various factors (I. Massaquoi and A. Abu, 2022).

### **1.1 Government Hospital, Kenema**

According to (I. Massaquoi and A. Abu, 2022), the Government hospital, Kenema, is situated in the city's center on the axis of Eastern Polytechnic and the Kenema Town-field along the Kombema and Sumaila streets.

The COVID-19 testing capability in Sierra Leone, which was already being done at the Kenema Government Hospital, was increased in 2020 because of a €500,000 grant from the German Corporation for International Cooperation. Due to shortages in worker protective equipment and labor strikes by hospital employees who have not received payment, responding to COVID-19 at the hospital is difficult.

Government, private, and non-governmental organizations all offer healthcare (NGOs). The Ministry of Health and Sanitation (MoHS) is in charge of healthcare. To expand coverage after the civil war in 2002, the Ministry

switched to a decentralized health care delivery system. There are 21 community health centers (CHC), 17 community health posts (CHP), 44 maternal child health posts (MCHP), one government hospital, one government clinic, two mission clinics, one mission hospital, and one NGO clinic, and three private clinics in Kenema. Sierra Leone's primary healthcare system includes traditional medicine. Malaria and Yellow Fever are endemic diseases in Sierra Leone.

### **1.2 Problem Statement**

In underdeveloped nations, including Sierra Leone, avoidable illnesses and untimely deaths continue to claim a high toll. Districts, regions, communities, and social and peer groups are all impacted by unequal access to essential health services. In most nations, including Sierra Leone, the health care sector is underfunded, resulting in inadequate quantitative and qualitative service delivery and widening building and equipment maintenance gaps. Duplication of efforts, overlapping tasks, and resource waste have become frequent and problematic issues in the health sector due to inefficient and unfair resource distribution and a lack of coordination among key players (I. Massaquoi and A. Abu, 2022).

To provide more and more equitable access to high-quality treatments while lowering or at least containing the rising cost of healthcare, Sierra Leone is reforming its health sector. There are many aspects to health reform, and other countries use different models (PAHO, 1998). Information technology can significantly improve service accessibility and quality in hospital administration.

To improve health, efforts must be made to enhance the district's public health management system. Medical programs are intended to supply elective emergency and long-term clinical health care, educate the populace, improve nutrition and hygiene, and create cleaner living conditions.

### **1.3 Aim and Objectives**

I. Massaquoi and A. Abu (2022) states that this research aims to evaluate how information technology is used to deliver services at the Government Hospital in Kenema, Sierra Leone, which will be used as a case study. The following goals were listed to fulfill the purpose of this review article;

- i. To ascertain the difficulties encountered in integrating information technology in the Kenema Government Hospital,
- ii. To investigate the connection between information technology and service delivery at Kenema's Government Hospital.

#### 1.4 Research Questions

The following research inquiries will be considered to ensure that the review is in line with its objectives:

- i. What obstacles must be overcome to integrate information and communication technologies at the Kenema Government Hospital?
- ii. What connection exists between information technology and the provision of services at the Government Hospital in Kenema?

#### 1.5 Delimitation

Only the effect of information technology and service delivery on government hospitals in Sierra Leone will be evaluated in this review study. Only the Kenema Government Hospital in the Kenema District will be the subject of the study.

#### 2.1 Framework Conceptual

In my opinion I. Massaquoi and A. Abu (2022), the basic framework of this research is to investigate how the following relatively new health services—regarded as the independent variables—affect the role of information technology in health services.

The delivery of health-related information and services via telehealth can range from something as simple as two medical professionals talking over the phone to something as complex as performing robotic surgery between facilities on opposite sides of the world. Telehealth services are a tool in the application of information technology, depending on how it is used or intended for us to provide health services using information technology.

Observing patients' conditions, providing prompt treatment, and improving monitoring are the main goals of video conference health services. A patient's problem may be understood, there can be consulted, and a proper diagnosis can all be made through video conferencing in the healthcare industry. For instance, experts in the field of neurology are using video conferencing to schedule online consultations with

patients in remote locations where hospitals and clinics might not have a neurologist on staff. For a quick and often life-saving assessment and diagnosis, neurologists can be contacted remotely to confer with patients in only a few minutes (Vidyo, 2012).

Regardless of the time of day, the severity of the medical issue or the distance from a hospital, mobile health services, and medical advice is instantaneously available. In cases where a visit to the hospital is not necessary, patients can receive guidance over the phone.

The primary goals of computer health services are to raise the level of service delivery quality, discuss effective stakeholder consultation, and promote stakeholder cooperation. Computer It is possible to create a computer-based routine reporting system for population-based health services, scientific studies, online encyclopedias, differential diagnostic tools, clinical practice, and hospital management systems.

A system of interconnected computer networks called "Internet health" links several billion devices globally using the standard Internet protocol set. In this study, the dependent variable that affects how information technology is employed in health services is internet health service.

#### 2.2 The Health Sector and Information Technology

The world's landscape is changing due to technology today, paving the way for the advanced technological age. The rising role of Information Technology has significantly impacted the Health Sector. It has dramatically decreased operating & administrative costs for people while also improving care quality, patient security, and data protection (I. Massaquoi & A. Abu, 2022).

The communication gap has been eliminated thanks to the more user-friendly and widely adopted telecommunications gadgets. Information technology has made it easier to acquire information, making people feel more at ease using the services provided by the health sector.

Delivering treatment and care to a patient anywhere in the world will be simple if a doctor has the proper communication channel. The system aids the medical professional in keeping track of the patient's history, diagnostic results, and current

state of health. In addition, the doctor can consult with the patient, suggest a checkup, and issue prescriptions.

Due to a lack of correct information, the villagers are not well informed about the Health Sector. Another obstacle to getting the patient to the hospital on time is the transportation challenges in rural locations. This typically results in demise.

This is a significant factor in the villages' elevated infectious illnesses and fatality rates. This can be resolved by setting up a suitable communication route so the doctors in the countryside can contact the adjacent towns, saving many lives.

### 2.3 Use of Information Technology for Service Provision

Researchers are examining various critical issues relating to the use of information technology in the provision of services. The effectiveness of information technology in service delivery and how it affects effective service delivery have been extensively studied by researchers. A logical extension or look-into format will enhance a model that would analyze elements from inside and outside organizations and from a service-dominant logic perspective.

According to the logic of the service-dominant model, a service can provide value and items that could support it. Productivity can be evaluated simply as output/input when only considering interests. An underlying presumption is that the product's quality should be kept constant. Due to the intangibility, heterogeneity, inseparability, and perishability of services, the assumption of a continuous rate is called into question when services or good-service bundles are considered. Developing productivity measurement techniques is necessary for maximizing the productivity of newly developed and existing services.

The introduction of cloud computing marks a significant shift in information technology, giving businesses new strategic possibilities. The development of complete corporate ecosystems, like the well-known Apple hardware, software, media, and mobile application ecosystem, is made possible by cloud computing.

### 2.4 Hospitals' Use of Information Technology

Computers have significantly improved day-to-day hospital operations in four areas—clinical implications, administration, research, and community settings.

**Clinical Implications:** Computers are used in clinical implications for the following tasks: evaluation, patient monitoring, documentation, telemedicine, and electronic medical records (EMR). Computers are used during assessments to collect and store patient data. Information technology is employed in NICUs, intensive care units, and emergency rooms to monitor vital signs, calculate cardiac output, and even measure pulmonary artery pressure.

**Administration:** To determine the price of nursing services, the administration nursing administrators employ computers. Hospitals can evaluate the cost of their services thanks to tools like QuickBooks and Excel. To maintain a balance between the two, these algorithms would also assist in comparing the net values of money coming in and leaving out. Paycheck calculations, employee wages, and the taxes that should be deducted from each salary are all made possible by computers. Computers are used in research to prepare research documents, collect data, assist with education, run simulations, and create tutorials.

The development of computerized literary databases has dramatically expanded the area of medical research.

**Community Settings:** Computers are utilized in community settings for automated remote patient monitoring, patient appointment identification systems, home care administration, and data collection. Hospital computers may store various information, including the location of patients being treated and the classification of diseases. Utilizing a computer to collect data enables accurate documentation in an organized, summarized, and understandable format.

### 2.5 The Main Advantages of Using Information Technology in the Health Sector

The efficiency of the health care industry can be increased in several ways, including by using new information technology, wearables, or applicable games like serious games. The advantages of these new technologies can be summed up as follows: (i) By reducing the amount of time needed to manage paperwork and process data, information technology and serious games for health can assist lower these expenditures.

Since it expedites the gathering of tests and findings, the picture transmission and storage system is crucial to advancing the development of electronic medical case reports and telemedicine. (ii) The use of information technology and new remote devices makes invoicing a cost-effective practice. Despite these data's support, most nations do not employ electronic invoicing extensively.

## **2.6 Following Hospital Information Technology Use**

There are several implications of information technology utilization in a hospital on the efficiency of the service, both positive and negative. As a result, there are benefits and drawbacks. The following items are priced for information technology in hospitals: Increased Patient Accessibility, Internet Accessibility, Patient Knowledge, and Improved Quality of Care...

The following list of drawbacks of information technology in hospitals: Digital Divide among Patients, Security Issues, Lack of Information Control, Safety and Privacy

## **3.0 Research Techniques**

### **3.1 Research Approach**

According to Polit et al. (2001:167), a research design is a strategy that specifies how, when, and where data will be gathered and evaluated to provide a comprehensive response to the research question. Descriptive research methods were employed in this study. Descriptive research identifies the frequency with which something occurs or the relationship between variables, according to Cooper and Schindler (2003). The researcher employed a descriptive research design based on the nature of the review objectives to evaluate the use of IT and service delivery at Kenema Government Hospital in Sierra Leone (I. Massaquoi & A. Abu, 2022).

### **3.2 Sampling Method**

Sampling is the process of choosing a portion of an aggregate or totality based on a judgment or conclusion about the sum or whole. It is learning about a whole population by looking at only a tiny portion of it (Kothari, 2004:152). A stratified sampling technique was used to choose workers from the Kenema Government Hospital for various departments or units. The entire personnel of the various departments was represented by fifty (50) members of the Kenema Government Hospital management (I. Massaquoi & A. Abu, 2022).

## **3.3 Data Gathering**

Primary data were gathered using semi-structured questionnaires with both closed-ended and open-ended questions from both primary and secondary data sources. To allow respondents enough time to answer the study's questions, the researcher used the drop-and-pick method of data gathering. Due to the country's epidemic and socioeconomic climate, only 45 of the 50 questionnaires issued (or nearly 90%) were returned (I. Massaquoi & A. Abu, 2022).

A questionnaire is a list of questions often emailed to a subset of respondents to respond to at their convenience and then return to the researcher (Kothari, 2006; Cohen et al., 2000). According to Kothari (2006), questionnaires are the most crucial tool for data collection. Utilizing questionnaires is convenient, impartial, and provides leverage for less significant financial effects. As a result, the researcher ran the process while distributing self-administered questionnaires to the chosen few respondents who filled them out.

## **3.4 Data Analysis Method and Results Presentation**

The data were categorized and prepared for computation according to the various groups of respondents who participated in the procedure. The most popular and effective program for data analysis, Statistical Package for the Social Science (SPSS 23.0), was used to code the data and perform the analysis. Tables and charts were used to examine the data and show the information in an informative manner (I. Massaquoi & A. Abu, 2022).

## **4.0 Findings and Results**

This analysis sought to ascertain how Kenema Government Hospital, a government hospital in Sierra Leone, used information technology and delivered services. The essay aims to identify the difficulties associated with deploying information technology at the Government Hospital in Kenema and with looking at how these issues relate to service delivery there.

### **4.1 Data Analysis and Presentation**

The employees at Kenema Government Hospital provided their responses to a questionnaire that was utilized as a data collection tool. From the whole personnel of the Kenema

Government Hospital, a sample of medical officers was selected (I. Massaquoi and A. Abu, 2022).

#### 4.2 Respondents discuss how implementing IT

Another goal of this study is to discover Kenema Government Hospital's difficulties in utilizing information and communication technologies. The respondents were prompted to list any problems using information technology tools. Table 4.1 and Figure 4.1, which are provided below, detail the analysis.

**Table 4.1:** Implementing ICT: Challenges

		Freq.	Percent %	Valid %	Cum. %
Valid	Lack of required expertise	13	32.5	32.5	32.5
	High cost of implementation	13	32.5	32.5	65.0
	Insufficient funding	10	25.0	25.0	90.0
	Poor Electricity Supply	4	10.0	10.0	100.0
	Total	40	100.0	100.0	

Research survey from 2021



**Figure 4.1:** Implementing information technology presents difficulties.

According to table 4.1 and figure 4.1 above, out of the 40 respondents, 13 indicate that one of the biggest obstacles to utilizing information technology is the high cost of implementation, and 13 more say that a significant obstacle is a lack of necessary knowledge. In addition, ten respondents cited a financing shortage as a problem, and four added a problem with the quality of the electrical supply. This has demonstrated

that, despite the advantages brought about by information technology, staff members and customers nevertheless encounter obstacles.

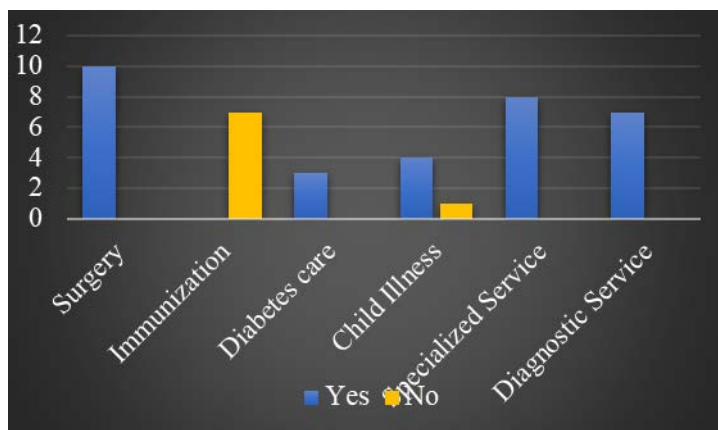
#### 4.3 To investigate the connection between information technology and service provision.

One of the study's goals was to find the connection between information technology and service delivery at Kenema Government Hospital. Table 4.2 and picture 4.2 following reveal the analysis's specifics.

**Table 4.2:** Health services your department provides \* Do you employ any IT tools in your division?

		Do you use any IT tool in your department		Total
		Yes	No	
Health services offered by your department	Surgery	10	0	10
	Immunization	0	7	7
	Diabetes care	3	0	3
	Child Illness	4	1	5
	Specialized Service	8	0	8
	Diagnostic Service	7	0	7
Total		32	8	40

Research survey from 2021



**Figure 4.2:** Departmental list of health services.

Information technology and healthcare service delivery are related, as seen in table 4.2 and figure 4.2 above. It demonstrates how service delivery is the foundation for how information technology is used at Kenema Government Hospital. In other words, not all services require the use of information technology. Information technology tools are not needed for service delivery, such as immunization in Kenema Government Hospital. Additionally, while services like child illness do not always require information technology tools, others do, such as surgery, diabetic care, specialized services, and diagnostic services.

### Conclusions

The study aimed to evaluate how healthy information technology and service delivery are used at Sierra Leone's public hospitals, namely Kenema Government Hospital. A 100% response rate was received for the study. A total of 40 questionnaires were distributed, and the study collected everyone. The surveys had questions that met the study's goals (I. Massaquoi & A. Abu, 2022).

Information and communication technologies are not utilized at Kenema Government Hospital. To facilitate service delivery at the hospital, management should make every effort to increase the institution's information and communication resources. The government and other development partners should make some of these technologies available so hospitals can operate more effectively.

The administration of Kenema Government Hospital could offer staff members scholarships or training in using information technology tools to reduce the expense of hiring specialists. Instead of flying highly ill patients to other countries for

treatment, the government or other developing partners can strive to provide funding for hospitals to use information and communication technologies.

The following recommendations for further research should be followed after this study is finished: The Kenema Government Hospital in Kenema was the sole subject of this study. However, other hospitals in the nation are utilizing information and communication technologies. Researchers are urged to investigate them. In the future, significant hospitals in additional locations should be included for the researcher to reach relevant results.

Future research should compare hospitals that have and have not included information and communication technologies in their daily operations.

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