EFFECTS OF MANAGEMENT INFORMATION SYSTEM ON HEALTH SERVICE DELIVERY AT DAR ES SALAAM CITY COUNCIL IN TANZANIA

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CERTIFICATION

The undersigned certifies that he has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation entitled: **"Effects of Management Information System on Health Service Delivery at Dar es salaam City Council in Tanzania".** In partial fulfillment of the requirements for the award of a Degree of Master of Business Administration (MBA) of the Open University of Tanzania.

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Dr. Janeth Isanzu

(Supervisor)

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Date

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DECLARATION

I, **Rashid Said,** declare that, the work presented in this dissertation is original. It has never been presented to any other university or institution. Where other people's works have been used, references have been provided. It is in this regard that I declare this work as originally mine. It is hereby presented in partial fulfillment of the requirement for the Degree of Master of Business Administration (MBA) of the Open University of Tanzania.

……..……

Signature

……..……

Date

DEDICATION

This work is dedicated to my beloved parents: my father and my mother my beloved wife, my lovely daughter and my friends who helped me in one way or another towards the production of this dissertation.

ACKNOWLEDGEMENTS

I would like to extend my special gratitude in the first place to the Almighty God for giving me health, strength, ability and his sustaining support to successfully undertake this study. The heartfelt thanks go to Dr. Janeth Isanzu, my supervisor for her kindness, understanding and professional guidance and encouragement and who showed confidence in me. I would like to give special thanks to all members of staff of the Faculty of Business Management of the Open University of Tanzania (OUT) for their cordial assistance in one way or another.

ABSTRACT

The main purpose of this research was to investigate the impact of Management Information Systems in the health service delivery to the community of Dar es salaam City Council (DCC). Specifically, the study aimed at identifying ICT skills available for health service delivery, examining ICT facilities and tools available at DCC. Furthermore, to determine improvement of services based on effective MIS. Sample of the study was fifty (50) respondents sampled using simple random sampling and purposive sampling technique. Data were collected using questionnaires and semi-structured interviews. Data was analyzed using simple descriptive statistics and the use of tables derived from MS excel. The study found that there is no ICT policy currently in the DCC, and that there was a shortage of ICT skills among health service providers. It was also apparent that ICT facilities were not adequate and that Council's information system was not working effectively due to lack of central database system. The study concluded that those with ICT skills, who were using the few ICT facilities available, agreed that the use of ICT improves both quality and quantity of health and education services. The study recommended that the Council should adopt an ICT policy to guide it in its implementation of ICT projects. It also recommended that the Council should strive to acquire ICT skills and facilities needed for effective utilization of MIS in the health service delivery to the community of Dar es salaam City Council.

Keywords: *Management Information System; Information Technology*

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LIST OF ABBREVIATIONS

BMAF	Benjamin Mkapa Aids Foundation
CHMT	Council Health Management Team.
CMT	Council Management Team.
COSTECH	Commission for Science and Technology.
DCC	Dar es salaam City Council
EHIS	Electronic Health Information Systems
EGPAF	Elizabeth Glaser Pediatric AIDS Foundation.
EHRs	Electronic Health Recording
ICT	Information and Communication Technology.
HHS	Health and Human Services
HIS	Hospital Information Systems
HMIS	Health Management Information System
IS	Information System
IT	Information Technology
LAN	Local Area Network
LGA	Local Government Authority.
LGRP	Local Government Reform Program
LIS	Labaratory Information Systems
MIS	Management Information System.
MTUHA	Mfumo wa Taarifa za Utoaji wa Huduma za Afya
NGO	Non-Governmental Organization
OECD	Organization
SPSS	Statistical Package for Social Science.

TCC	Tanzania Communication Commission.
UNDP	United Nations Development Program
URT	United Republic of Tanzania
USA	United States of America
VAT	Value Added Tax
WAN	Wide Area Networks
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Overview

This chapter introduces a background to the study, problem statement, and research objectives involving general and specific objectives. It also shows research questions, significance of the study and scope. It ends up with organization of the entire study.

1.2 Background to the Study

The responsibility of management in any business is to ensure that the organizations they are in charge of run efficiently and productively. No matter if an institution is a government entity, a business entity, or a not for profit entity, this is the general rule. Many variables are thought to be required for achieving this goal, however it has lately come to light that knowledge is the most important aspect for the success of any company or commercial entity. An organization's management needs timely access to reliable information in order to make decisions that will have a significant impact on the organization's success and long-term viability (Warioba, 2012).

An information system will be created through the combination of these factors, and the efficiency of each of these factors has an impact on the overall efficacy and success of a specific management information system (MIS). The use of technology in MIS is crucial since it helps with information gathering, storage, modification, analysis, and distribution. Due to the ease of information storage and retrieval,

technology can also reduce expenses and save time. It is crucial to give information and communication technologies (ICTs) top priority while developing any successful MIS because current MIS largely rely on them. The first computer was introduced for business applications like payroll processing in 1954, setting the bar historically for technology utilization in MIS applications (Mniwasa & Shaure, 2011).

In Tanzania, an ICT 500 was the first computer installed, and by 1972, there were about seven computers throughout the nation (Mgaya, 2014). Systems that additionally offer information resources to help managerial and decision-making tasks represent the cutting edge of information processing today. Systematic information management has grown in importance as a component of organizational control in recent years. O'Brien (2003) asserts that a new MIS would function within the limitations. Some are required by the environment, such the government's requirement for specific tax reports, or the use of an electronic fiscal device in Tanzania for value added tax (VAT) reports.

Customers' requests for billing information might occasionally put pressure on MIS. The management of the company imposes further restrictions. For instance, local government authority (LGAs) has caps on the amount of money that can be used to purchase ICT equipment. Tanzania yet uses MIS in a variety of economic, social, and cultural realms to promote development, much like many other developing nations.

Tanzania imposed an import ban on computers and related equipment in 1974; the restriction was later lifted in the early 1980s (Mgaya 2014). Since then, ICT usage in

the nation's LGAs has increased tremendously. The organizations that already use computerized MIS have shown how crucial it is for performance enhancement. However, different developing nations employ IT to varying degrees.

This directly hinders the success of application of MIS. There are several problems which hinder application of information technology (IT), dominant one being lack of funds. Mambo (2015) observes that in most cases, funds for IT development in developing countries come in the form of grants, aid, and donations. Such donations though useful are in most cases provided in piecemeal and are inadequate and unsustainable in the long run. This directly hinders application of MIS in one way or another. Most LGAs in Tanzania still lag behind in the application of information technology (Mniwasa & Shaure, 2011). Few institutions have IT facilities used for information management, and accessibility due to a number of reasons including inadequate funding, bureaucracy, poor telecommunication and communication facilities and erratic and unreliable power supply. The study attempted to examine application of MIS at Dar es salaam City Council (DCC) in the service delivery by Health departments.

1.3 Statement of the Research Problem

Local Government Authorities (LGAs) are ideally situated to make significant contributions to the national development process. The proper operation of almost all sub-sectors of agriculture, health, infrastructure, education, economy, and politics is regarded to be dependent on MIS. Fundamentally, without adequate and effective MIS implementation in the LGAs, neither the general public nor any of these

subsectors can experience sustainable development. According to Jones *et al*. (2019), there are a number of obstacles to the development of MIS, including poor management, a lack of funding, technophobia, and weak institutional infrastructure. All facets of service delivery at the LGA are impacted by the MIS's poor development (Warioba, 2012). The society does not have access to enough information about its needs, and it is also poorly informed on the services offered by the LGA. There are instances where one department within an LGA is unaware of what is accessible in another department (Chandrashekar, 2018). Therefore, the goal of this study is to evaluate the Dar es Salaam City Council's use of MIS as a key development driver and a means of achieving the targeted level of service delivery in terms of performance.

1.4 Objectives of the Study

1.4.1 General Objective

The general objective of this study was to investigate the impact of MIS in Local Government Authorities on health service delivery at Dar es salaam City Council.

1.4.2 Specific Objectives.

Specific research objectives were: -

i) To identify IT skills used in health services delivery to the community at Dar es salaam City Council (DCC)

ii) To identify types of information communication technology available for health service delivery to the community in DCC

iii) To examine whether health workers at DCC get timely and adequate information for their operations?

1.5 Research Questions

i) What are the IT skills used in health services delivery to the community at Dar es salaam City Council (DCC)?

ii) What are the types of information communication technology available for health service delivery to the community in DCC?

iii) Do health workers at DCC get timely and adequate information for their operation?

1.6 Significance of the Study

Information is important in decision making, at every level operator need information for planning future activities and implementing the current ones. Management Information System is therefore of paramount importance for effective operations of an institution. A good flow of information from one person to another, acts like a lubricant to a well-functioning service delivery system by LGAs. The study therefore analyzed the role played by MIS in the Health service delivery in DCC. The study tried to examine whether there is MIS application in the Local Government Authorities, whether MIS application has brought about effectiveness as well as knowing the problems that are encountered in MIS application. On the other hand, the study provided the researcher with the opportunity to utilize knowledge gained during the MBA programs to sharpen his research skills. This study is also in partial fulfillment of the requirements of the awards of Master's Degree.

1.7 Scope of the Study

This study focused staffs working at DCC. The study was conducted for a period of six months.

1.8 Organization of Study

Chapter one of this study consists of background of the study, statement of the research problem, objectives of the study, research questions, significance of the study, scope of the study and organization of the study. Chapter two contains literature review and it is divided in the following sections; introduction, theoretical literature review, literature review from earlier studies, conceptual framework and synthesis. Chapter three is about research methodology, it starts with introduction and goes with giving details of research design, population of study, sampling procedures and sample size, data collection methods and data analysis methods. Chapter four presents the results of the study together with analysis and the findings. The last chapter presents summary, conclusion and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Overview

The chapter presents the literature related to the study. The chapter starts with definition of key terms, followed by theories regarding the study. This is followed by empirical studies, research gap and conceptual framework.

2.2 Definition of Key Terms

2.2.1 Management Information System

Davis & Olson (1985) define Management Information Systems (MIS) as a wide variety of computer resources to perform transaction processing, to provide processing for formal information and reporting systems, and to accomplish managerial decision support. The office use of computers and communication technology to support person-to-person communication and clerical support functions can also be included as part of management information systems.MIS is integrated systems of man and machines for providing the information to support operations, the management, and the decision-making function in the organization (Chandrashekar, 2018).

2.2.2 Local Government Authority

Local Government Authority is defined as an institution established by law to perform or execute powers or functions within a specified area of jurisdiction (Warioba, 2019). It can be a village, ward, district, town, municipality of city

council. Some scholars consider local government to be an institution to which legal and political authority from central government and its agencies are transferred (Mniwasa & Shaure, 2011).

2.3 Characteristics of Electronic Health Information Systems

Optimizing Electronic Health Information System (EHIS) performance is essential for health service delivery due to its many benefits, including raising the quality of healthcare service delivery, reducing costs spent on healthcare, as well as reducing the level of unintended risks (Bowman, 2018). The misapplication of the electronic health records system may lead to errors related to the electronic health records that may threaten the security of the information contained in the electronic health records. Such mistakes may lead to the emergence of serious errors that may endanger the safety of the patient and compromise the quality of healthcare services (Bowman, 2018). There are major components to consider for an EHIS function to function efficiently which are as follows: patient diagnosis management, clinical care management, pharmacy management, laboratory management, radiology information system management, and billing system are major components that govern the efficiency of EHIS functions.

Realizing the integration and impact of health sector regulation in the era of big data Contemporary management decisions have become primarily data-driven because many industries have become interested in big data (Batarseh & Latif, 2019). Big data has three characteristics: a. Size b. Speed and c. Miscellaneous (Ramesh *et al.,* 2016). The United States Department of Health and Human Services (HHS) recently

issued a license to use Electronic Health Records (EHRs). It is possible to display medical materials that were in paper form and work on applying them on a large scale to various electronic equipment and devices in electronic data format. The rapid spread of medical and health information systems, with all their diagnostic equipment, has resulted in the generation of a huge amount of medical data such as clinical/laboratory, personal health management / social affairs network data, medical expenses / medical insurance fund data, etc.) (Heart *et al.,* 2017). The efficiency of healthcare systems depends on three main components: accessibility, quality, and cost. To increase the capacity of the health sector, it is imperative to reduce costs while maintaining the quality of the medical services provided or working to improve them (Abedjan *et al*., 2019).

The fastest and most cost-effective way to do this is to make the most of the important information that is overwhelmed by the vast amount of medical data. Modern information and communication technology contribute to the development of new and arguably innovative methods to achieve the idea of disseminating and exchanging information among all institutions (Ying *et al*., 2017). Hospitals and medical centers are good places for large data warehouses such as patient records, test reports, medical images, etc. It is also important to integrate information into a medical information system as a milestone upon to reduce medical costs and work to increase the reliability and efficiency of these systems, and support patients.

By the best treatment a medical information system typically includes a hospital information system (HIS), electronic medical record (EHR), laboratory information

system (LIS), radiology information systems (RIS), and image archiving and communication system (PACS) (Ying *et al.,* 2017). High quality care (QoC) requires processing information with users but from multifunctional groups (e. g. pharmacists, physicians, experts, and even patients) (Baird, *et al*., 2012).

Despite this, these groups with different and multiple functions are only partially connected in a highly decentralized network and need information system (IS) integration to achieve integrated planning. Even though there is data inflation, the data is fragmented and scattered among systems in incompatible formats and stored in isolated islands (Zhang *et al.,* 2015). At present, society has become characterized as a digital society in a very dynamic way, and also the business integration between science, technology, and medicine has led to the emergence of applications for data in new and contemporary formats that are characterized by a lot of flexibility and protection. Advanced information technologies such as cloud computing, data analytics, and the Internet of things will enable the integration of complex data such as electronic medical records, genetic databases, social media, and wireless mobile medical devices.

Various medical institutions can work on exchanging and sharing medical information, and hospitals' internal departments can manage this information in the best way possible in order to break break down the information isolation barrier and work to gradually integrate information as a service for health care, thus improving the entire medical system (Bhavnani *et al*., 2016).

2.3.1 Information Technology Problems in Health Care and Their Consequences

There are a set of challenges in the surrounding environment facing health information system operations that may hinder proper implementation as well as expansion processes. Among these topics is the difficulty of intervention, lack of consensus on technical opinions, scarcity of human resources, poor leadership skills, lack of funding, employee resistance, poor management, weak organizational capacity, and insufficient awareness of the use of techniques (Yamey, 2012). The E-Health Information Systems assessment will focus not only on hardware and software but also on the information processing process, that is, the interaction between information technology and its beneficiaries in a given environment. Evaluating these systems not only does require an understanding of computer technology, but also requires an understanding of the social processes, the behavioral consequences that they follow, and the impact of technology on them.

The success of information technology depends, for example, on its compatibility with the clinical workflow, the appropriate mechanism of how this technology is introduced into the organization, the level of efficiency of the information derived from these systems, as well as the training, support, level of use and user encouragement (Berg, 1999). Accordingly, it can be said that the objective of evaluation usually takes a broader curve.

2.3.2 Poor Leadership Skills

Unsupervised administrative processes that contain many inconsistent procedures leads to poor management and weak EHS oversight, which is a major challenge,

especially in countries with limited capabilities (Asangansi *et al.,* 2013). Among its causes are the delay in providing health data and the lack of feedback from specialists or supervisors (Kapadia *et al.,* 2012).

2.3.3 Lack of Funding

Implementation of an Environmental Health Information System (EHIS) requires high-cost and continuous financial support for the provision of hardware and software, as well as the need for maintenance, training, and continuous development of human resources, which will lead to high costs (Unstable electrical power supplies and a scarcity of IT equipment are also contributing factors to impeding the successful implementation of EHIS.

2.3.4 Insufficient Capacity of Health Systems

Continuous changes in regulations negatively affect the overall healthcare system and create obstacles to the successful implementation of EHIS *(Ghia et al., 2013).* Challenges facing the health system were noted about expanding health in South Africa where the IT environment was weak and the capacity to implement communications was low (Leon *et al.,* 2012). Barriers to improving the public health sector in South Africa were discovered through the E-Health Strategy, and in particular through the ERM system integration. Inequality, red tape, and the remedial structure are the main obstacles (Katuu, 2016).

2.3.5 Weak Application of Diffusion Techniques

Lack of skills in handling information technology is disincentive to implement EHIS (Dornan *et al*., 2019). In many cases, poor skills in dealing with technology, or so-

called computer literacy, and low morale for using the system contribute to negatively impact on implementation (Yamey, 2012).

2.3.6 Personnel Resistance

A study was conducted in South Africa where it was observed that there is a real difficulty in implementing EHIS, due to physicians' resistance to the use of EHIS and their preference for the paper system (Ohuabunwa *et al.,* 2016). In Iran, too, negative attitudes of staff regarding the order and lack of receptivity were among the obvious obstacles to the successful implementation of EHIS in hospitals (Ahmadian *et al.,* 2014). Although all required information was available at EHIS in South Africa, hospital staff showed reluctance and lack of actual response due to resistance to the use of EHIS in treating patients as well as about prescriptions (Marutha &Ngulube, 2012)

2.4 Theoretical Literature

2.4.1 MIS and Health Management

According to Li (1972) a plethora of seminars, speeches, articles, and scholarly books extolling the virtues of MIS has descended upon the business community. Online, real-time, data base and teleprocessing have become part of the ‘complete’ managers’ vocabulary, albeit with less understanding of meaning than usual. In fact, management field has accepted the reality of the concept of MIS with open arms. The types of key decisions which have to be made daily will somehow become easier when the promised data appear in precisely organized formats. In order to look at the concept and the application of MIS, an appropriate starting point is to look at

management and its most fundamental actions in the attainment of their objectives. Type of information required by decision makers in an organization directly is related to the level of management decision making and the amount of structure in the decision situations they face. The framework of the classic managerial pyramid shown below applies even in down sized organizations and flatten or nonhierarchical organizational structures. Level of management decision making still exist but their size, shape, and participants continue to change as today's fluid organizational structures. According to Heeks (1998) IS can support the different management roles: i. Operational management. This role is often largely supervisory in nature and so MIS for operational management may well be used to support day-to-day monitoring and control.

The members of self-directed teams or operating managers develop short-range plans such as weekly production schedules. They direct the use of resources and performance of tasks according to procedures and within budgets and schedules they establish for the teams and other workgroups of the organization. Such MIS will contain 'higher-order' feedback to plans. These MIS might involve any of the areas in which basic operational information systems function such as accounting and human resources. ii. Tactical Management. Increasingly, business professional in self-directed teams as well as business unit managers develop short and medium range plans, budgets, and schedules and specify the policies, procedures, and business objectives for their subunits of their organization. MIS for this role operate in the same areas as of operational management, but take an organizationally-broader and longer-term perspective. There might be a greater emphasis on human decision

making (because situations are less certain and structured) and on more ‘upstream’ control feedback. iii. Strategic management. Typically, a Board of Directors and an executive committee of the Chief Executive Officer and top executives develop overall organizational goals, strategies, policies, and objectives as part of strategic performance of the organization and its overall direction in the political, economic and competitive business environment.

MIS can support strategic management. However, rational description of the strategic role places a particular emphasis on planning and, for more senior managers, and on integrated view of the organization. In every government institution it is the interaction of the decision made in each of the above categories which determines the viability and effectiveness of the service delivery in that organization. Any MIS effort then, should address, both in cause and effect terms, the impact of having systems which can influence the outcome of these various decisions and actions. Given the flexibility of IT and IS, Management Information Systems application impacts are strongly determined by the management decisions of those creating the MIS. In turn, these decisions will themselves be affected by a range of wide factors. For example, in India, MIS were largely shaped by an organizational politics of self-25 interest and a culture of corruption prior to the actions of a non-government organization in pressuring government for more access of information (Roy, 1996). As with all other management tools and techniques, systematic planning and execution are of fundamental part of a successful MIS development. High computer hardware and software costs underscore the importance of a foresighted and rational rush out and purchase a computer system and then try to

figure out how to use it have clearly put the cart before the horse. Unfortunately, much has been the case time and again in recent years (Kadushi, 1992).

2.4.2 Features of MIS

O'Brien (2013) portrays that until the 1960, the role of MIS was simple: transaction processing record keeping, accounting and other electronic data processing (EDP) applications. Then another role was added, taking on board the concept of MIS was added. This new role focused on developing business applications that provided managerial end users with predefined management reports that would give managers the information they needed for decision making purposes. MIS provide information in the form of reports and displays to managers and many business professionals. For example, sales managers may use their networked computers and web browsers to get instantaneous displays about the sales results of their products, to access their corporation intranet for daily sales analysis reports chat evaluate sales made by each salesperson.

Managers and other decision makers use an MIS to request information at their networked work stations that supports their decision-making activities. This information takes the form of periodic, exception, and demand reports and immediate responses to enquiries. Web browsers, application programs, and database management software provide access to information in the intranet and other operational database of the organization. Operational database is maintained by transaction processing systems. Data about the business environment are obtained from internet or extranet databases when necessary.

In order for MIS to perform its monitoring and control roles it produces reports. This is mainly what managers perceive about an MIS since these are its tangible outputs. Reports come in many forms, as described below. They can be differentiated in two main ways by content and by schedule (Heeks, 2008). 1. Differentiation by content MIS reports fall into three main categories of content: i. Detail report. This contains all relevant information on the report topic. For example, a detailed registration report might give the following information for students: student registration number, name, and each individual payment for the year to-date. ii. Summary report. This contains a summarization of information on the report topic. For example, the total number of staff in each unit, each unit's total payroll bill for this year, and the percentage change between the two. Some summaries may be recognized performance indicators. For example, on measure of a unit's performance might be its total actual payroll bill as proportion of the total budgeted payroll bill. iii. Exception report. This filters out information to provide just which is deemed to be important, according to some pre-set criteria. It may be summarized or detailed for example, a report could include student name, pass marks this and last year, and percentage change between the two, only for those students whose pass marks rose by more than 10%.

2.4.3 Human Side of MIS

According to Heeks (2008) people are the key to MIS success. Even the best designed MIS can be brought to its knees by overt and covert resistance. Managers who understand why people resist MIS are in a better position to take preventive steps than their counterparts who ignore the human side of the MIS equation. Impact

of MIS on managerial behavior: Organization behaviorists see potential for conflict between MIS rationality and natural human emotions. MIS go beyond traditional attempts to make organizations more rationally effective and efficient. They affect not only formal and official dealings, but also informal and unofficial interaction. For example, suppose a manager no longer gets to announce the weekly cost figures at the departmental meetings because the daily figures are now disseminated by the computerized information system that manager perceives a loss in personal status or influence and consequently may resist the new system.

Resistance to MIS will vary from level to level in the organization, as will the type of resistance. Resistance can be in form of aggression, projection, or avoidance. There are several constructive measures that a manager can take to neutralize resistance to MIS and avoid techno stress: i. From the very begging, obtain top managements' support of and commitment to the MIS ii. Develop and implement the MIS with the full participation of all affected parties iii. Clearly state the MIS's purpose, characteristics and scope. This will centre discussion on facts instead of fiction. iv. Humanize the IS by ensuring that users will feel that they are making a worthwhile contribution to the organization. People usually resent the ideas of being controlled by machines.

According to O'Brien (2013), MIS can be introduced to support a variety of organizational activities, as described below. Internal Transaction-Based MIS Three main types of management information systems fall into this category: accounting, human resources and 'other' Account Far more than anything else, the emphasis of

public sector MIS has been on money: on monitoring how much has been spent; on comparing this with budget; and on controlling expenditure to bring it is as close as possible to budget at year end. Human Resources MIS are used in the entire human resource lifecycle from recruitment to termination or retirement. Reports include: i. Vacancies: for example, a detail report on all vacant posts in the organization. ii. Recruitment and selection: for example, a summary report on ethnic origin and sex of all job applicants and recruits for use in equal opportunities monitoring. iii. Staff performance: for example, an exception report on only those secretarial staff who are able to make shorthand dictation and type at over 50 words per minute. iv. Payroll: v. Training: for example, an ad hoc report on all staff who has received training in gender awareness. vi. Staff promotion: for example, a detail report on all performance assessments for a potentially-promotable member of staff. vii. Staff departure: for example, a comparative report on turnover rates and reason for departure in the information systems and accounting departments. viii. Pensions: for example, a summary report on recent annual pension funds growth rates. ix. Other: For example, a comparative report on workplace accident rates on different days of the week; this and other categories may relate to government reporting and compliance.

2.5 Empirical Literature Review

A number of studies have been conducted on MIS application with regards to Tanzania, but most of them covered only specific aspects of MIS and so provide inadequate picture of MIS application in developing countries like Tanzania.

Elly (2016) investigated ICT access and use in research institutions in Tanzania, which he found out that due to poor infrastructure, poor ICT skills among the potential users, lack of ICT policy as well as poor management and access to and use of ICT was poor. He further noted that the root cause of these problems emanates from the poor economy that result in little funds being allocated for acquisition of ICTs. Also, poor access to and use are also associated with unfavorable management conditions especially in those institutions with the required ICTs. These include bad physical settings/location of the gadgets, poor time allocation for use of the ICT facilities and bureaucratic procedures in using the facilities.

Bynit (2017) carried out at the School Inspectorate Department of the Ministry of Education and Culture, Tanzania; found out that problems hindering application of ICT include illiteracy and shortage of IT facilities. Other problems indicated in her study involve lack of funds leading to inadequate facilities, lack of qualified/skilled staff, power cuts and lack of participation on budget allocation.

Ngumuo (2017) pointed out several problems including lack of skills, inadequate facilities, low budget for acquisition and maintenance of IT resources, power shortage, lack of computer networking and appropriate software in the banking system. Generally, the available literature shows that the problems which hinder the effective utilization of ICT are varied but mainly related to limited IT skills, knowledge and competence among staff, inadequate IT facilities, lack of computer networks and appropriate computer software. On the other hand, the recommended solutions for such problems include formulation of appropriate policy, staff training

and improved infrastructure for effective and efficient ICT use and providing computer networks in the respective organizations.

2.6 Research Gap

There is inadequacy of literature on Management Information System (MIS) as far as developing countries like Tanzania are concerned. Moreover, the available studies are inadequate in that they cover only certain aspects of MIS such as technology application (ICT) and the human aspect such as the level of staff competence in running the Information Systems. This study, therefore attempted to fill the research gap with a focus on its impacts on Local Government Authorities (Health) which are considered to be service delivery vehicles most close to the community who are end users.

2.7 Conceptual Framework

Effective management information systems require the presence of three interrelated resources, people, technology (both hardware and software), and information/data (Davis & Olson, 2015). Management information systems collects data/information processes it and provides it or managers and operators at all levels that use it for decision making, planning, program implementation, and control. Effectiveness of any of the three resources affects the performance and impacts of that particular MIS. The first step in effective MIS is inputting of data, managers must be aware of the quality of data they want collected, and determines if that data could result into the desired information if processed. Data comes in in different forms and from various sources, they have to be validated and consolidated to determine if it is what is

needed by the organization. It is not that any data is relevant to an organization. The second variable is the technology, presence of ICT facilities relevant to effective implementation of MIS. Technology should be in the form of both hardware and software.

ICT plays a vital role in capturing, storing, and delivering information at a low cost and saving time. Presence of up-to-date technology reduces the cost and time of delivering information to various users. For example, presence of computers which are locally networked will reduce paper shuffling and time spent to deliver information manually, for users could share information over the network without physical movement. Inclusion of ICT in school curriculum helps students to make effective use of resources and development of students' interest in studies. With the use of high-quality standard simulation demonstration students can be encouraged to take keen participation in studies as a result they can achieve better grades in other subjects.

The last aspect for effective MIS is the people, staff with the necessary skills to analyze and process data to give meaningful information, people with the require skills to operate available technological tools so as to capture, store and retrieve information whenever needed. People and their skills are the driving force of the effective MIS. The dependent variable here is improvement in the quality of health service delivery at the LGA which will have independent variables of such as having a proper Technology as well as qualified ICT staff and effective Information Communication Systems. The relationship is explained diagrammatically below.

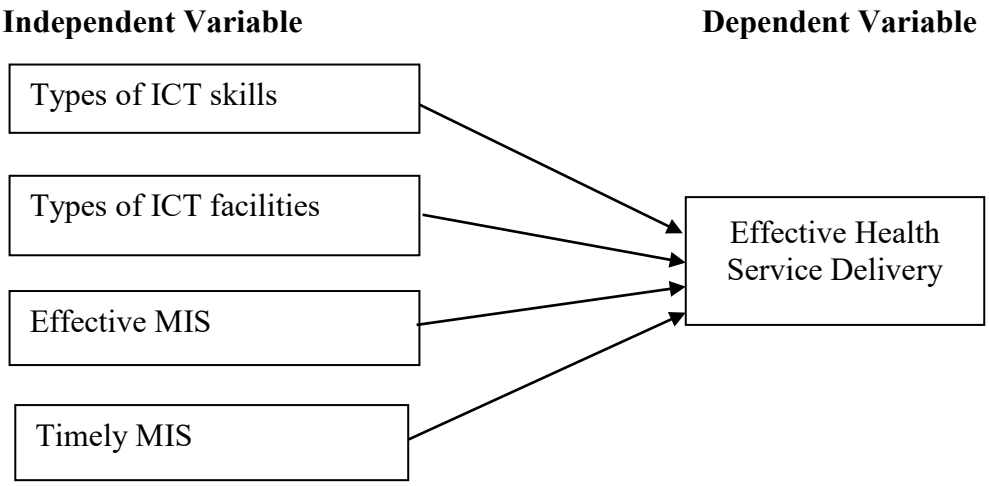

Figure 2.1: Conceptual framework

Source: Researcher 2022

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Overview

Research methodology refers to a systematic way applied to solve the research problem. This chapter describes the methodology that was used to conduct the study. Specifically, it focuses on the research design, population, sample size, sampling techniques, data collection methods, as well as data analysis procedure, among other.

3.2 Research Philosophy

Research philosophy refers to beliefs and assumptions on how the data of a particular phenomenon can be collected, analyzed and applied (Saunders *et al.,* 2019). Generally, research philosophy has many branches depending on various disciplines (Aarker*et al*., 2010). The business and management field have five main components of research philosophy. These are pragmatism, positivism, post-positivism, realism and interpretivism, which are described by philosophical assumptions that are epistemology (adequate knowledge), ontology (nature of reality) and axiology (role of values and ethics). Positivists' philosophy highlights that scientific inquiry should rely on observable and measurable facts rather than subjective experiences (Guba, 1990). According to this epistemological stance, what counts as knowledge can be captured through sensory information. This study will use positivist philosophy. Positivists believed that science is the medium through which truth could be unraveled. However, according to positivists, only the natural sciences such as physics, chemistry, and biology are counted as science. This tradition presupposes

that reality exists independently of research process and can be measured via objective application of scientific methods, whereby laws that govern the social world can be tested and proven.

3.3 Research Design

Research design serves as the guide for data collecting, measurement, and analysis (Kothari, 2006). A descriptive study approach was used for this investigation. This is because just one Local Authority was thoroughly examined. This approach is particularly practical since it allows for the flexible use of a range of data gathering techniques, including interviews, questionnaires, observation, and documentation.

3.4 Area of Study

The study was conducted at Dar es Salaam City Council in Dar es Salaam Tanzania. The selection of Dar es Salaam City Council is based on the fact that it is a council within the first largest city in Tanzania with high population. The use of ICT; an environment that allows for establishment of MIS is therefore of paramount importance in the provision of health services. Mnazi Mmoja Hospital, Chanika, Pugu and Buguruni Health Service centres were the primary centres used in this study.

3.5 Population of the Study

Leady (2008) defines population as the aggregate of all the cases that conform to designated set of specifications. The population consists of Dar es Salaam city council health staff consisting about 1000 personnel. The staff is made up of medical

doctors, nurses, accountants, clerks, ICT staff and personal secretaries phamathetical staff, lab technicians both management and supporting staff are included. The categories of respondents are selected because they are responsible in the day to day application of MIS through the available ICT facilities.

3.6 Sampling Techniques

Sampling is the process of selecting units (e.g., people, organizations) from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen (Trochim, 2006). The methods used in picking the sample were simple random sampling technique and purposive sampling.

Simple random sampling: Simple random sampling technique allows each unit in a population to have equal opportunity to be included in the sample (Kothari, 2006). This sampling technique was used to select 40 respondents from health department from health centres and hospitals.

Purposive Sampling: Another sampling technique used was purposive sampling. According to Babbie (1992), this technique enables a researcher to select a sample on the basis of his or her knowledge of the population, its elements and research purpose. It is based on the researcher's judgments and purpose of study. The researcher employed this sampling technique to select 5 respondents from CMT and five councilors for interviews.

3.6.1 Sample Size

According to Kothari (2006), a sample of over 30 would be sufficient for most purposes. Fifty (50) respondents were selected as respondents for this study, made up of 40 staff from Health department, 5 from Councilors and 5 from the Council Management Team (CMT).

3.7 Method of Data Collection

Data was collected using primary data collection and secondary data collection Primary is original data collected from the field. Secondary data are data used for a research project that were originally collected for some other purposes (Saunders *et al.,*2015). Secondary data for this study were collected through review of documentary sources, in which books journal articles and reports, both published and unpublished, were reviewed. Primary data were collected by the use of questionnaires which were administered to 50 respondents, and interviews were done to five (5) CMT members and five (5) councilors among the sample size.

3.8 Secondary Data

According to Kothari (2006), secondary data are those type or kind of data which have already been collected by someone else and which have already been passed through statistical process. In this study, the secondary data was sourced from published reports, articles and journals.

3.9 Data Collection Instruments

The researcher employed the following instruments to collect data for this study.

The study employed the questionnaire, Interview and documentary review.

3.9.1 Questionnaire

Questionnaire is a research instrument consisting of questions to be asked to the respondents (Foddy, 1994). Questionnaires were used because it manages to collect information from a huge number of people in a short period of time and in a relatively cost-effective way. This tool gave room and freedom of expression to the respondents that they expecting to get more information to capture important themes of the study on the effects of MIS on health services at DCC.Open ended and closed questions were used. Questionnaires were distributed to 50 respondents, staffs of different hospitals and health centres.The researcher administered the filling of questionnaires from respondents. Questionnaires were distributed to respondents in order to get information relevant for the study. The questions were all close-ended questions in order to minimize ambiguity from respondents.

3.9.2 Interview Guide

The interview guide helped the researcher to fill in the gaps not covered by questionnaires. They were also used to get responses from 5 members of CMTa nd 5 councilors. This means that CMT and Councilors responded to both questionnaires and interview.

3.9.3 Documentary Review

According to Bowen (2009) documentary review is a secondary data collection method in which the researcher review and interpret various documents to give voice and meaning around an assessment topic. The researcher reviewed documented materials from websites, journals, articles, published books and research reports and

so forth. Moreover, data on the internet were located using the search engines like Google (http://www.google.com).

3.10 Validity and reliability

The aspect of validity and reliability was checked. In this study, the validity and reliability were considered before running the descriptive and inferential data analysis.

3.10.1 Validity of Instruments

Validity implies applicability and usefulness of the data obtained through such reliable design and all the way to conclusive findings (Kothari, 2006). Pilot study is done to test whether the tools are truly measuring what they intended to measure (Kothari, 2006). Validity of the tool was made by piloting the questionnaires before a comprehensive exercise of data collection to see if the tool can give consistent response from different respondents.

3.10.2 Reliability of the Instruments

Reliability is defined as the extent to which results are consistent overtime (Saunders *et al.,* 2012). Reliability has to do with accuracy and precision of measurement procedures. According to Phelan & Wren (2005) reliability is an extent to which the assessment produces consistent results. To test the reliability of the measurement scales, Cronbach's alpha (α) using SPSS software was used. The value of reliability test ranges from 0 to 1 specifying the degree of internal consistency of items using Cronbach's Alpha. The larger the value of Cronbach's Alpha, the higher the degree of internal consistency of the measurement scales, and vice versa. There acceptable

values of alpha are supposed to be at least 0.70 which justifies internal consistency (DeVellis, 2003).

3.10.2.1 Reliability Analysis

The reliability analysis was conducted to examine if the study has internal consistence. The reliability test revealed that Cronbach's Alpha values for types of ICT skills which has involved 5 item scales was 0.873 while that of types of ICT facility involved 5 item scales was 0.763, effective MIS which has involved 5 item scales was 0.720, timely MIS which has involved 5 item scales was 0.799, as shown in Table 3.1. The Effective Health Service Delivery measured by 5 item scales found to have Cronbach's Alpha of 0.919. In all Cronbach's Alpha values obtained, none of them has a value of less than a recommended value of 0.7. Therefore, the findings justify that the study has internal consistence.

Table 3.1: Results of Cronbach's Alpha showing reliability of the study instruments

Variable	Number of items	Cronbach's Alpha
Types of ICT skills	9	0.873
Types of ICT Facilities	5	0.763
Effective MIS	5	0.72
Timely of MIS	5	0.799
Effective Health Service Delivery	5	0.919

Source: Field data (2022)

3.11 Data Analysis

After the data were collected, the researcher checked qualitative data to ensure completeness, accuracy and uniformity; and for quantitative data, simple descriptive

statistics was used. Questionnaires were inspected and items were coded and data entered into SPSS Version 20 computer software to derive frequencies and percentages. The continuously measured variables – gender, age, education, marital status and years' job experience – which are measured in ratio (scale) were re-grouped and re-coded in ordinal level of measurement in form of group intervals (age group and interval of years' job experience) in order to present them in the table of frequency. Total and mean scores were computed for each scale item across respondents. On the other hand, qualitative data collected was edited in order to detect errors that could have occurred during data recording. To analyze qualitative data the researcher used content analysis; which according to Kombo & Tromp (2006) is a classification developed to record the information. To present the findings, Statistical data presentations such as tables and figures were used.

3.12 Research Ethics

For ethical requirements in the conduct of the study respondents were duly informed of the fact that the study was for academic purpose and that they were under no compulsion to respond to the questionnaire. The respondents were asked to participate voluntarily whilst assuring them of anonymity and confidentiality on the information given. In order to avoid plagiarism, all sources of information were duly acknowledged.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND DISCUSSION

4.1 Overview

This chapter deals with the results and discussion of the study. It starts with analyzing the data collected in relation to objectives of the research; it goes further to compare them with the research questions which were the guide to this study. It also presents the findings of this study in tables and descriptions.

4.2 Characteristics of Respondents

A total of fifty (50) respondents were targeted for distribution of questionnaires and interviews; forty (40) from Health department, 5 from Council Management Team (CMT) and 5 councilors. A total of 50 questionnaires were distributed to 50 health workers. Only 1 questionnaire was not returned from health department as the respondent travelled for three four training before he could return the questionnaire. All five members of CMT were interviewed, but only two councilors were available for interview; three of them were expelled by the Mayor and the rest of them were busy with politics to make sure that their colleagues are returned to the house.

4.2.1 Demographic Characteristics of Respondents

The demographic characteristics of the respondents assessed by the study include age, sex, marital status, education and job experience. Response level of respondents: the researcher aimed at administering 50 questionnaires, but only 46 questionnaires were administered. Four questionnaires were not responded. So, analysis was made

using only 46 respondents responded. The descriptions of respondents' demographic characteristics appear in the following sections 4.2.1, 4.2.2 and 4.2.3

4.2.1.1 Age

The study found that most of the respondents belonged to age group of 31-40 years (38.1%), followed by those (27.1%) who are in the age group of 21-30 years (Table 4.1). Other age groups were 41-50 (17.6%),51-60 (11.7%) and a few of the respondents (3.1%) and (2.4%) belongs to the age group of above 60 years and below 20 years respectively. The minimum and maximum age of respondents was 30 years and 58 years. Participants had the average age of 40 years.

4.2.1.2 Sex and Marital Status

The distribution of respondents based on sex show that majority of the respondents were males (54.1%). Only 45.9% of the respondents were females. On the other hand, married respondents constituted the majority (63%) of survey participants, followed by respondents who are still single (26%) as shown in Table 4.1. Other marital status composing widows and divorce constituted only 11% of the survey participants.

4.2.1.3 Level of Education

There was a variation of level of education among the respondents as shown in Table 4.1. The study revealed that most of the respondents had bachelor degree (47.8%). Other respondents had level of education below bachelor degree (37.1%) and above bachelor degree (10.8%). However, 4.3% of the respondents identified to be possessing non-formal education.

Table 4.1: Distribution of respondents according to demographic characteristics

Variable	Frequency	Percent
Sex	25	54.3
Male	21	45.7
Female		
Marital status		
Single	12	26.0
Married	29	63.0
Other	5	11.0
Age		
Below 20 years	2	3.1
21-30	12	27.1
31-40	18	38.1
41-50	8	17.6
51-60	5	11.7
Above 60 years	1	2.4
Education		
No formal education	2	4.3
Certificate	6	13.2
Diploma	11	23.9
Bachelor degree	22	47.8
Above bachelor degree	5	10.8

Source: Field data (2022).

4.3 Availability of ICT skills among Respondents

ICT skills are a big determinant of what a person can do with information and its communication. Whether a person can operate a telephone, a computer, a television, or a simple radio all depends on his/her ICT skills. It was revealed that health workers are more skilled in the field of ICT.

Table 4.2: Respondents with formal ICT training by Gender

		Yes		No		% of Yes to Total	
	Total	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Health Workers	39	11	6	7	15	28	23
CMT members	5	4	1	0	0	80	20
Councilors	2	2	0	0	0	100	0
Total	46	17	7	7	15	36	22

Source: Field data 2022.

The data in Table 4.2 shows that training in ICT is prevalent among male members of the DCC with 36.7% for male respondents having formal training against only 15.2% for female. Out of 39 respondents from Health workers, 17 were having formal training in ICT comprised of eleven male and six females. The fact that female is mostly nurses means that they are the ones who make the initial contact with customers. Patients arriving at dispensaries and health centers at Dar es salaam City Council (DCC) have to meet nurses first, who takes their medical histories before they meet doctors. The fact that they are not the majority with ICT skills at the Council does not argue well for quality and quantity of health and education service provision at the DCC.Another interviewee explained that the young people of today are more exposed to ICT tools than the old generation. He was quoted saying: -

> "*Unajua vijana wa sasa wanaanza mapema kutumia vyombo hivi, kompyuta pamoja na simu za mikononi. Wanazitumia kutafuta material kwenye intanet kwa ajili ya masomo yao, na wanazitumia pia kwa namna mbalimbali ya mawasiliano. Kuna mambo mengi sana unayoweza kufanya siku hizi kwa kutumia simu za mkononi tu.Ndiyo maana madaktari na manesi wengi walioajiriwa hivi karibuni wana ujuzi na mambo ya teknolojia ya habari na mawasiliano*."

Literally translated:

> "*The youth now days start to use these tools, computers and modern phones when they are very young. They use them to search for materials for their works; they also use them in various ways for* communicating*. There are so many things you can do now days using a mobile phone. That is why most of recently employed tdoctors and nurses are ICT literate*."

According to Table 4.3, out of 46 respondents only 8, equivalent to 17.4% can manipulate data using computers and other ICT tools available.

Table 4.3: Respondents who can manipulate data

	Total	Yes	No	% of Yes to Total
Health Workers	39	4	33	10.2
CMT members	5	2	3	60.0
Councilors	2	2	2	100.0
Total	46	8	38	17.4

Source: Field data, 2022.

Availability of ICT tools.DCC health workers revealed that they do not have enough computers to work with. Table 4.4 shows that out of 39 respondents from health workers, only 4 respondent's equivalents to 10.2% said that they have enough ICT facilities to work with. Overall only 8 respondents out of 46 respondent's equivalents to 17.4% have enough ICT tools to work with, majority of them being CMT members and Councilors. All respondents from CMT members and from Councilors are having ICT tools to work with.

As can be seen from table 4.4, the gap between what is required and what is available is too big. It cannot be easily deducted that the required technology is available for health and education workers in the Council. One of the respondents revealed that sometimes distribution of resources and bureaucracy is also a problem to access to working tools. For instance, every one of the 8 core member of CHMT is having a laptop, while health centers and dispensaries are going without even 1 computer. Sometimes computers are considered to be precious commodities which could not be left in the hands of illiterates.

Table 4.4: ICT tools requirements and availability

Department	Description	Requirement	Available	Shortage
Health	Website	1	0	1
	Photocopiers	4	2	2
	Phones	20	3	17
	Public address	1	0	1
	Printers	15	4	11
	Laptops	9	5	4
	Desktop computers	16	4	12
	Internet modem	16	5	11
	Fax machines	16	2	14
	Total	98	25	73

Source: Field data (2022)

According to Table 4.4, in the health department there are only 4 Desktop computers while the actual requirement is 16, a shortage of 12 computers. The actual requirements of phones are 20 but only 3 are available. There are only 2 fax machines while the actual requirement is 16. Only 5 internet moderns are available instead of the required 16. With the figure of non-availability of ICT facilities ranging from 65% and above, it becomes very difficult for the Council to put in place an effective MIS which is heavily dependent on the use of ICT. A CMT member associated lack of ICT tools to low budgets allocated towards acquisition and maintenance of computers and its accessories. A scrutiny of Council's budget for the year 2018/19 revealed that only 3 million TZS was allocated towards acquisition and maintenance of computers in the department of health. This finding is also in line with finding by Elly (2002) who when investigating ICT access and use in research institution in Tanzania found out that the root cause of ICT problems emanates from poor economies that results into little funds being allocated for acquisition of ICT facilities. Lack of adequate technology equipment prohibits smooth flow of information for routine use and decision making. IMC is running a number of 15

health facilities scattered all over the area. Information and communication technology are vital in the smooth functioning of a big organization like this. The table below summarizes the responses as whether the Council is budgeting funds to improve the existing ICT tools and systems.

Table 4.5: Council budget for improvement

	Total	Yes	No	%
Health workers	39	9	30	23
CMT members	5	3	2	60
Councilors	2	0	2	100
Total	46	12	34	

Source: Field data (2022)

According to table 4.6, only 23% of the respondents support the idea that the Council is budgeting for funds to improve the existing systems, majority of them being CMT members with 60%. Only 23% of health workers respondents agree to have budget for improving the existing tools and systems. The lack of budget for improvement of the existing tools and systems could explain presence of obsolete equipment at the Council. All 46 respondents agreed on one thing that the Council do not have a central database system. A centralized database is a collection of information at a single location accessible from numerous points (Avison & Fitzgerald, 2006).

There are advantages and disadvantages to this setup that can become considerations when people make decisions about how to configure databases. This is important to think about when setting up a new database or retrofitting a database to meet new needs. There are a number of ways to set up the centralized database. Multiple programming languages are well suited to database building and organizations can

also purchase database software rather than developing their own. Users may have a number of ways to access material, and the database can be set up with varying security levels to allow for more access controls. Information technology staff maintains the database with various operations to keep it orderly and address early signs of problems like viral infections. They can also change access levels on request and administer the security system (Avison & Fitzgerald, 2006). A centralized database can also be easier to physically secure (Chandrashekar, 2010).

However, the Council maintains a distributed database system where numerous data and information are stored in different locations. A distributed database is a system that consist of two or more data files located at different computers within an organization (Ozsu & Valduriez, 2011). Information may not be the same in those different locations but may be different according to individual needs. Out of 19 respondents who have computers to work with only 12 keeps distributed database, 6 health workers, and 3 CMT members. The rest are using their computers mainly for reading reports and recreation. This trend suggests acute shortage of information to decision makers at various levels. Health workers are also keeping different databases for their consumption which include; Inventories of health equipment and drugs database, Health workers data, Disease diagnosis data, Latrine use at school's data, and Health centers and Dispensaries operations data. The Council is in the final stage of implementing Fully Integrated Electronic Health Management System known as MTUHA, an acronym for a Kiswahili Phrase "*Mfumo wa Taarifa za Uendeshaji wa Huduma za Afya*" The health care system in Tanzania, and especially the government's referral system assume a pyramidal organization structure of health

services, which is from the primary level (village health posts, dispensaries, and health centers) to district hospitals, regional hospitals and finally, consultant hospitals (URT, 2008).

The health facilities collect data, which are then aggregated at the district level where the reports for the particular district are being generated. This is being done manually, that is, using paper-based forms. Data from the districts are sent to the regional level, where the reports for a particular region are being generated and sent to the national level. At the regional levels reports generation is being done using a computer system. The HMIS includes all data collected at all the health units in all levels. MTUHA were first introduced in the country in 1999 by Ministry of Health (URT, 2008). IMC being a recently formed LGA is still using manual system in health data collection and storage, but through its budget for year 2018/19, the Council plans to computerized 9 out of 15 of its Health centers and Dispensaries.

According to Table 4.6, all computers at the Council are not connected to one another. Responding on whether the computers at DCC are connected to one another or networked, out of 19 respondents who are having computers to work with 18 said NO; meaning the computers are all stand alone and there is no sharing of resources.

Table 4.6: Results showing whether IMC computers are connected

	Total	**Yes**	**No**	**%**
Health workers	12	0	12	0
CMT members	5	1	4	20
Councilors	2	0	2	0
Total	19	1	18	94.7

Source: Field data (2022)

This suggests that the level of information sharing is low, and that there is no maximum utilization of available resources. If the computers were networked, it could be easy for respondents to share information without shuffling papers, and resources like printers could serve different users at the same time without involving physical movement. It was also the interest of this study to investigate how information is acquired and distributed among various users at the Council. The study therefore went on to investigate the use of different ICT facilities in information sharing. Table 4.7 below represents the findings.

Table 4.7: Frequency of use of ICT facility

ICT Facility	Frequency	Percentage
computer	26	56.50
Telephone	44	95.60
Radio	44	95.60
Internet	18	39.10
Electronic email	22	47.80
Fax machine	8	17.30
Scanner	5	10.80
Printer	10	21.70

Source: Field data (2022)

From Table 4.7 Forty-four (44) respondents (95.6%) indicated that they use telephones and radio sets, although the sets belong to them and not provided by the Municipal, 56.5% of the respondents indicated use of computers, more than a third have either used internet or electronic mail, but the use of fax printers, and scanners is still very low. This trend shows that information at IMC is mostly shared through the use of telephone. An interview with a CMT member revealed that when information is required urgently say from a school or a dispensary, they can read it to

you over the phone and you write it down, then wait for official written paper report which might come in some days later. In order to determine the effectiveness of the information systems in the Council, the study was also interested in knowing the various reasons for respondents in using ICT facilities. Among the reason chosen by the study were, use for capacity building, improving health and sanitation, improving teaching conditions, better use of information, recreation, and time saving.

Table 4.8: Reason for using ICT facility

Reason	Frequency	Percentage
Improving health and sanitation	12	26.0
Better use of information	6	13.0
Recreation	11	23.9
Time saving	5	10.9
Improving communication	5	10.9
Capacity building	7	15.2
Total Required	**46**	**100**

Source: Field data (2022)

Analysis of data from table 4.8 shows that majority 23.9% of ICT facility users are using those facilities for recreation like playing cards and watching movies. Only 10.9% responded that use of ICT tools can result in time saving. 13% were of the opinion that use of ICT facilities can promote better use of information. 26% of the respondents were using ICT facilities to improve health and sanitation, and only 15.2% for capacity building. It was also the interest of this study to identify different reasons which prohibited respondents from using ICT facilities at the Council. The limiting factors chosen include lack of ICT skills, availability, power blackouts, cost of connectivity, and technophobia. Table 4.10 displays the findings.

Table 4.9: Challenges in using ICT facility

Reason	Frequency	Percentage
Power blackout	9	19.5
Unavailability of ICT facility	12	26.0
Lack of ICT skills	10	21.8
Connectivity costs	8	17.3
Technophobia	7	15.2
Total Required	**46**	**100**

Source: Field data (2022)

Most of the respondents 26% could not use ICT facilities simply because they are not available. This result is in line with the findings in table 4.5 showing requirements and availability of ICT facilities. Power blackout is second at 19.5%. According to unpublished IMC periodic reports, the Council is having a total of 15 health facilities out of these only 8 have reliable power sources, and out of its 24 secondary schools, only 16 have reliable power sources. A respondent from one of the health facilities also said that most of the time they are using solar power which is for lights only, and could not be used to power other machines like desktop computers. According to the figures above, it seems that majority of respondents simply do not use ICT facilities because either of availability or power blackouts. Almost half of the respondents do not have the required ICT skills.

Table 4.10: Presence of ICT policy in the Council

ICT Policy	Frequency	Percentage
Present	2	4.3
Not present	34	73.9
Not aware	10	21.7
Total Required	**46**	**100**

Source: Field data, 2022.

Analysis of the data shows that 73.9% of the respondents are of the opinion that the policy is not present in the council with 21.7% not aware whether the policy exists or not. Only two respondents equivalent to 4.3% maintains the policy is present. One of the interviews was quoted as saying "*I have never seen such policy at our work place. In fact the officer responsible for ICT have just recently been employed, who could have prepared the document*". Further follow up on the statement reveled that ICT officer was only employed in July 2013. A copy of the ICT policy document could not be found at the Council premises.

4.4 Performance Improvement on Service Delivery

According to Table 4.2 out of the 46 respondents, 24 respondents responded that they have formal ICT training and out of these 24, 19 responded that they have enough ICT facilities to work with. On whether working with ICT facilities have improved their performance in the service delivery, all the 19 respondents with ICT working tools agreed.

CHAPTER FIVE

SUMMARY OF MAIN FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Overview

This chapter deals with giving summary of main findings, conclusion and recommendations of the study basing on the findings. It gives conclusion and recommendation for the research.

5.2 Summary of the Main Findings

5.2.1 Availability of ICT Skills

Out of the 46 respondents, only 24 equivalents to 52% have formal training in ICT skills, but out of these 24 respondents, only 8 equivalents to 33.3% could manipulate data using ICT facilities available at the Council. This shows that the training done to staff at IMC is inadequate, irrelevant or not matched to the needs of the trainees. Trainings are also biased towards a person's position in the Council. Table 4.3 shows that all CMT members and Councilors are trained in ICT skills, it also shows that majority of CHMT members are more knowledgeable in ICT skills compared to other health workers. The findings also show that training is biased towards gender issues. Out of 9 health workers with training in ICT Skills 6 are men and only 3 are women.

5.2.2 Availability of ICT Facilities for Service Delivery

The study found out that there is a shortage of ICT facilities for service delivery in the health at DCC. Results that only few respondents had ICT facilities for work. The

study also found out that distribution of ICT facilities is based on an individual's position in the Council as all CMT member and Councilors are having ICT facilities. There is a disparity of distribution based on departments. The council does not budget enough funds for improvement of existing facilities and acquisition of new ones. Results further showed that there is a huge gap between ICT equipment requirements and availability. This does not argue well for implementation of effective MIS, as it is heavily dependent of ICT. Additionally, results show that the most used ICT facilities are telephone and radio sets which are personal properties of the respondents and not provided by the Council.

5.2.3 Effectiveness of Information Systems at Dar es Salaam City Council

DCC do not have a central database system, something that makes information accessibility very difficult. The existing distributed databases are also widely dispersed. There is no adequate communication facility to access existing data. Existing facilities even within the department are not connected to allow for storage, retrieval and sharing of information. The documents must be printed and shared manually which is very costly. Results showed that only few respondents use ICT facilities to improve health services. MTUHA which was introduced by Ministry of Health and Social Welfare is not running at the moment at DCC. There is no any software to capture health or education data at the Council. Above all there is no ICT policy implemented in the Council at the moment.

5.2.4 Performance Improvement on Service Delivery

Despite the fact that at the moment there is no adequate ICT skills, no enough ICT

facilities to work with, and no adequate effective information systems at the Council, those who are using available ICT facilities agrees that they improve their performance towards delivery of health and education services.

5.3 Conclusion

The findings of this study are adequate to conclude that at the moment there are no adequate ICT skills at the Council to use even the available facilities effectively. Training in ICT skills is biased towards male work force and towards position in the Council hierarchy, and that staff trainings in ICT skills does not suit the needs of the Council. There are no adequate ICT facilities at the Council, and the little available facilities are not distributed evenly among Council workers. The Council is not setting aside enough funds to improve the existing facilities. Lack of ICT skills and non-availability of ICT facilities have led to ineffective management information system, and delay in decision making. Information is delivered manually in most cases and sometimes it takes longer for information to reach targeted official.

5.4 Recommendations

This study recommends the following: - First: There should be a proper training needs assessment (TNA) to determine the gap between the skills available and the requirements of an individual's position. Training needs should not be based on individual's position or gender but on the position's requirement.

Second: That the Council should set aside enough funds to reduce gap of ICT equipment requirements, and that the distribution of the available facilities should be done based on individual's or department's needs and not otherwise. Third: That the

Council should develop and put in place a comprehensive ICT policy which will act as a guideline in implementing an effective information system at the council. Fourth: That the Council should strive to put in place facilities that support presence of effective Management Information Systems for improvement of health and education service delivery.

5.5 Limitations and Delimitations

5.5.1 Limitations

This focus was on assessing impact of MIS application in Local Government Authorities in the provision of health and education services in Ilala. Some Municipal officials were of the opinion that the researcher was involved in a commercial research and were unwilling to provide information free of charge. Some officials were unwilling to give information on the ground that they were sensitive information. Due to time and financial constraints one Authority (DCC) located in Dar es salaam was covered.

5.5.2 Delimitations

The researcher explained the aim of the study, and that it was not commercial but for the purpose of attainment the Master's degree. They understood and provided information free of charge. The permission to gather sensitive information was sought and granted from the Municipal Executive Director. The researcher also sought financial assistance from the employer and some of the relatives. Financial assistance was granted by employer and relative to cover travelling, accommodation and communication. The rest were funded by the researcher from his own savings

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APPENDICES

Appendix I: Questionnaire

Part I: Introduction

My name is **Rashid Said**. I am pursuing a Master's in Business Administration - (MBA) at the Open University of Tanzania. This questionnaire is designed to gather information on the research topic: "The effects of management information system on the service delivery at Dar es salaam City Council in Tanzania". This research is for partial fulfillment for attaining MBA degree. I therefore kindly request you to respond to questions below. I personally assure you of ultimate confidentiality for any information that will be given to me during this research. Your contribution to this research will be highly appreciated.

Respondent's Personal details:

Sex	
Male	
Female	
Marital status	
Single	
Married	
Other	
Age	
Below 20 years	
21-30	
31-40	
41-50	
51-60	
Above 60 years	
Education	
No formal education	
Certificate	
Diploma	
Bachelor degree	
Above bachelor degree	
Service user experience	
1-5	
6-10	
11-15	
16-20	
Above 20	

Part II: IT Skills

1. Do you have any formal training in information technology? YES/NO.

Do you have any formal training on ICT	
YES	
NO	

2. Do you use computers for clients' registration (Patients or students)? YES/NO

Do you use computers for clients' registration	
YES	
NO	

3. Can you manipulate data using computers? YES/NO

Can you manipulate data using computers	
YES	
NO	

4. If the answer is "Yes" to 3 above, are your computers connected to one another? YES/NO.

Are your computers connected to one another	
YES	
NO	

5. Has working with ICT facilities improved your performance? YES/NO.
6. Have ever used any ICT facility? Please tick the one used. ICT facility Tick used Computer Telephone Internet Radio Electronic mail Fax Printer Scanner
7. What was the reason for you using ICT facility? Please tick your reason.

Reason	
Capacity building	
Improving health and sanitation	
Improving health conditions	
Better use of information	
Recreation	
Time saving	

Part III: Availability of ICT skills among Respondents

8. Do you have staff with enough ICT skills at workplace?

Do you have staff with enough ICT skills	
YES	
NO	

ICT Facility Availability

9. Do you have enough ICT facilities to work with? YES/NO

Do you have enough ICT Facilities	
YES	
NO	

10. Frequency of use of ICT Facility

ICT Facility	
computer	
Telephone	
Radio	
Internet	
Electronic email	

11. Does the Council budget for funds to improve the existing systems? YES/NO.

12. Reasons for using ICT Skills

Please tick the appropriate

Reason	
Improving health and sanitation	
Better use of information	
Recreation	
Time saving	
Improving communication	
Capacity building	

ICT Policy

13. Is there an ICT policy at the Council level?

Tick Correct answer about ICT Policy

ICT Policy	
Present	
Not present	
Not aware	

Part IV: Information Availability

14. What type of information do you collect and store in your department? Please explain……
15. Does information from your database help you in your daily decision making? YES/NO.
16. Does information from your database help you to improve service delivery? YES/NO.

THANK YOU

Appendix II: Research Clearance Latter

THE OPEN UNIVERSITY OF TANZANIA
DIRECTORATE OF POSTGRADUATE STUDIES

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Our Ref: PG201803161 Date: July 3rd, 2022

City Director,
Dar es Salaam City Council
P.O. Box 20950
Dar es Salaam

RE: RESEARCH CLEARANCE

The Open University of Tanzania was established by an Act of Parliament No. 17 of 1992, which became operational on the 1stMarch 1993 by public notice No.55 in the official Gazette. The Act was however replaced by the Open University of Tanzania Charter of 2005, which became operational on 1stJanuary 2007.In line with the Charter, the Open University of Tanzania mission is to generate and apply knowledge through research.

To facilitate and to simplify research process therefore, the act empowers the Vice Chancellor of the Open University of Tanzania to issue research clearance, on behalf of the Government of Tanzania and Tanzania Commission for Science and Technology, to both its staff and students who are doing research in Tanzania. With this brief background, the purpose of this letter is to introduce to you Mr. Rashid Said, **Reg. No: PG201803161** pursuing Master of Business Administration (MBA).

We hereby grant this clearance to conduct a research titled ***"The Effects of Management Information System on Health Service Delivery at Dar es salaam City Council in Tanzania".*** He will collect his data at your area from 6th, July 2022 to 16th, August 2022.In case you need any further information, kindly do not hesitate to contact the Deputy Vice Chancellor (Academic) of the Open University of Tanzania, P. O. Box 23409, Dar es Salaam. Tel: 022-2-2668820. We lastly thank you in advance for your assumed cooperation and facilitation of this research academic activity.

With kind regards,

Prof. Magreth Bushesha
DIRECTOR OF POSTGRADUATE STUDIES