St. Mary University

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF MBA

THE EFFECTS OF INFORMATION SYSTEM ON SERVICE DELIVERY: THE CASE OF ETHIOPIAN DOCUMENTS AUTHENTICATION AND REGISTRATION AGENCY

BY

ZENA ABEBE GEBREMARIAM

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Advisor: Mulugeta G/medhin (Ph.D)

A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (GENERAL MBA)

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ADDIS ABABA, ETHIOPIA

ST. MARY'S UNIVERSITY
SCHOOL OF GRADUATE STUDIES
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BY

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DECLARATION

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Dr. MulugetaGebremedhin (PhD). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institutions for the purpose of earning any degree.

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Name Signature

St. Mary's University School of Graduate **Addis Ababa May, 2021**

ENDORSEMENT

This thesis has been submitted to St. Mary's University School of Graduate for examination with my approval as a university advisor.

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Advisor Signature

St. Mary's University School of Graduate, **Addis Ababa May, 2021**

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ABBBREVATIONS AND ACRONYMS

IS	Information System
IT	Information Technology
ICT	Information Communication Technology
ADRD	Act and Document Registration Department
ADRA	Act and Document Registration Agency
EFDARA	Ethiopian Federal document Authentication and Registration Agency
GO	Government Organization
NGO	Non-Government Organization
OECD	Organization for Economic Co-operation and Development
TAM	Technology Acceptance Model
CD	Compact Disc
SDT	Service Delivery Time
SERVQUAL	Service quality
SERVPERF	Service performance
EDI	Electronic Data Interchange
OIS	Office Information system
TPS	Transaction Processing System
OS	Operating System
SPSS	Statistical Package for Social Science
DW	Data Warehousing
CEO	Chief Executive Officer
GDP	Gross Domestic Product

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Abstract

Information system is clearly considered as a key growth area in this century, specifically, in a dynamic and highly competitive business environment which requires utilizing advanced IT tools. And organisations are increasingly using different information systems to develop solutions to business problems, to improve both the efficiency and effectiveness of the decision-making process, to enhance productivity and service quality, to achieve dynamic stability, and compete for new markets. Hence, this study is to examine the effect of information system on service delivery of the Ethiopian Document Authentication and Registration Agency. The proposed design approach asked participants to respond to a self-reported questionnaire, components of information systems as the independent variable, and service delivery as the dependent variable. Factor analysis was performed to identify the Agency's IS with service delivery performance to tested. The study population consisted of three branches of the Ethiopian federal document authentication and registration agency out of fifteen braches. From these, 82 employees and 3 managers of the three branches were chosen. The hypothesis to test variables of the study was absorbed in a questionnaire with Cronbach's alpha coefficient of 75% and was prepared based on a number of measures related to the subject of study. Ranges of methods were used to analysis statistical data, and the results were extracted using SPSS. The regression analysis results indicated a positive and statistically significant association between IS and service delivery. Based on this, we recommend the agency to work more on the system security issues and use IS as astrategic tool to enhance the performance of service delivery and expand their empirical knowledge in the context of public service delivery sectors in Ethiopia.

Key words: *Information system, service delivery.*

CHAPTER ONE: INTRODUCTION

1.1. Background of the Study

1.1.1 Introduction

We live today in an automated and service oriented society. This could be observed in the daily activities we perform, the way our economy is composed and all the devices and appliances we use in our everyday lives. The role of automation in shaping the current societies is undeniable. The resettlement of people from rural countryside to manufacturing in cities and later to the service sector worldwide was only made possible by replacing human work force through machines. At the early stage of automation, the most crucial gain is probably the drastic increase in output both in the agriculture sector and manufacturing; without which it wouldn't have been possible to feed and meet the demands of all people in the world today(Ramtin, 1991). On the later stage, automation was more concerned with increasing efficiency, improving quality and effective resources utilisation (Groover, 1987). A modern manufacturer no longer produces all his products in house at one location rather; the production and supply chain is spread over different geographical regions and among many manufacturers (Reichwald&Piller, 2009). This trend is further facilitated through information and communication technologies which is also a descendant from automation.

Since the early years of the 20th century, the world has been experiencing a revolution known as information technology. Some consider it to be the most fascinating development since the industrial revolution around the mid-18th Century (Tom, 1991). This revolution is changing our daily lives at home and at work, in shops and banks, in schools, colleges and universities. It is changing the way people think, communicate and behave. Today, the world has become a global village with the internet, mobile phones and satellite networks shrinking time and space, bringing together computers and communications; resulting in new ways of communication, processing, storing and distributing enormous amounts of information (UNDP, 2001). Advancement in chip, satellite, radio, and optical fibber technology has enabled millions of people around the world to connect electronically regardless of national or international boundaries. This explosion in connectivity is the latest and the most important wave in the information revolution (Evans &Wurster, 1997).

Information System (IS) is clearly considered as a key growth area in this century, specifically, in a dynamic and highly competitive business environment which requires utilizing advanced IT tools to improve efficiency, cost effectiveness, and deliver high quality products and services to customers (Allen & Morton, 2004). Information System is also considered as a tool of marketing, contacting customers and looking for possible customers, as well as presenting IT services as distinguished potential services for customers (UNDP, 2001; Werthner& Klein, 2005).

Organisations are increasingly using different information systems to develop solutions to business problems, to improve both the efficiency and effectiveness of the decision-making process, to enhance productivity and service quality, to achieve dynamic stability, and compete for new markets (Attewell& Rule, 1984; Molloy &Schwenk, 1995; Boynton, 1993). According to Cerere (1993) organizations have always sought and adopted technologies that enhance efforts of their manpower in production and management. Indeed he noted that although it has evolved over a considerable period of time, information technology has emerged as an important tool in management of organizational operations.

The essence of study is to show the relevance of information system to service delivery and to determine the extent to which it affect the service delivery of the Ethiopian documents authentication and registration agency. Internally, improved IS can enhance and strengthen organizational infrastructure and capacity by increasing employees' efficiency; service coordination; information sharing between departments. Externally, information technology solutions can fundamentally transform business organization service delivery (Allison, 2010).

1.1.2 Background Information of the Agency

As of other countries of the world, the services of authentication, registration of juridical actswere introduced to Ethiopia by Italians during their occupation in 1936/37 which is long before the coming into force of the Ethiopian modern codes including the Civil Code which highly required the services indicated. Yet, the service was interrupted in 1945 due to the evacuation of the beginners from the country.

After the liberation, the power was given to Addis Ababa High Court which gave the service for sometimes. In 1970 Contract Unit, was established under the High Court to give the service. In 1976 the service was taken from the judiciary, i.e. the High Court and put under the Ministry of Justice under civil affairs department. The Ministry was given the power to ensure, organize and supervise the activities of the public notary. In 1991 the Contract Unit under the Ministry got a new name Act and Documents Registration Department /ADRD/. In

1993 this division was put under Region 14 Justice Bureau by proclamation No. 41/1993. In 1994/1995 this division and advocates division were put back under the Judiciary under the Regional Supreme Court.

Since 1996 however the division was changed to agency and put under Addis Ababa CityGovernment by the Governor of the City and got the name: Acts and Documents Registration

Agency /ADRA/. Since 2003 the Agency was organized by proclamation No. 334/2003 with the name Documents Authentication and Registration Agency /DARA/. According to this proclamation the Head of the Agency was assumed to be appointed by the City Government of Addis Ababa. This Agency was strictly given the power to provide service of notary on the Federal Jurisdiction /Addis Ababa and Dire Dawa City Administrations. However, since 15th day of February, 2016 the

Agency was put under the Ministry Justice by proclamation No. 467/2005 with a new nameDocuments Authentication and Registration Agency, (DARA draft report, 2016). Now days Agency has two main head offices (Addis Ababa and Dire Dawa) and thirteen branches and their respective head offices (in Addis Ababa City Administration).

From these three branch offices of the agency will be selected in the study,because of the volume transaction, location, number of customers and employees. Hence,Gulele branch, Ayer Tena branchand Kasanchis branch with a large customer base and service products. The highest proportion was taken from those agencies with a large customer base and variety of servicing products.

Table1.1: Name of the agency with respective services

No	No Head agency and Agency	Services provide to customers
1	Branch 1-Lancha	• To authenticate and register documents; • To administer oath and receive affidavits and register same; • To keep custody of specimen of signature and/or seal upon request by those concerned; • To ascertain the capacity, right and authority of persons who are about to sign or who have signed documents submitted for authentication; • To ascertain with respect to contracts
2	Branch 2-Salute	
3	Branch 3-intersection	
4	Branch 4-Six Kilo	
5	Branch 5-Gulle	
6	Branch 6-Air Health	
7	Branch 7-Kaliti	
8	Branch 8-Kasanchis	
9	Branch 9-Wind Phone Lafto	
10	Branch 10-Birthday	
11	Branch 11-CMC	

12	Branch 12-Bole	made to transfer properties for which title certificates are issued under the law: • The right of the transferor to transfer the property; and • The property is not mortgaged or pledged or such property is not attached by court order. • Enter into Contract. • Own and Transfer Property.
13	Branch 13: Gojjam Porch (Merkato)	
14	Branch 14 - Jemo	
15	Dire Dawa branch	

Source (www.Dara.gov.et)

1.2 Statement of the Problem

There are an increasing number of contexts in which information system is being used to support or replace the human service agent in the quality service delivery. This development is taking place against a background of growing technological sophistication, global market places and communities, and an ever increasing significance of service products in national and international economies. Little has been written on the role that information system plays in enhancing quality service delivery. Marmouse (1997) highlighted that; organization's performance on service delivery represents the manner in which the company is organized to reach its objectives and the way it manages to reach them. Over the years, Ethiopian Federal document Authentication and registration agency (EFDARA) continued to grow as a service delivery and this involved a change in its operations and processes. There was tremendous growth in the number of technological devices used by staff at EFDARA and investments on data management and communications systems. Anticipated changes in organizational performance involve reduction in the duration taken in processing critical tasks and elimination of repetitive tasks resulting in higher productivity and efficiency as well as better and quality service delivery.

Despite the importance of using Information Systems for service delivery, EFDARA, unlike to many organizations, especially the public organizations in Ethiopia, have adopted well to implement and utilize information systems. This is due to the fact that, the agency is striving to deliver a reliable, timely and quality services by training and upgrading knowledge of the employees. And the managements are also striving to overcome the challenges that affect information systems implementation and utilization. For instance, the Ethiopian Computerised Information Systems are experiencing inadequate resources such as physical

components (hardware & communication channels) which involve the Information Systems construction and trained people in the field of computer science. The nonphysical components are also experiencing failures related to management skills, software development and systems analysis. But EFDARA struggles to overcome such problems.

Besides, Most of Public Sectors in Ethiopia have not adopted the Information Systems technology due to the inefficiency of expertise on computer related technologies. In Ethiopia most of employees/Staff in the Public Sectors have limited knowledge in computers hardware and software so that this problem affects almost 60 – 75 % of employees who use paper for their work. Most employees are not aware about the Information Systems and services available/used in the system. (Haramaya university college-of-computing-and-informatics)

This study was to determine the extent to which Ethiopian federal documents authentication andregistration agency (EFDARA) practices had successfully implemented and utilized the information system in their organization,and how the system has brought dramatic changes on service delivery.

1.3. Research questions

1. How does the adequacy of computer hardware affect the service delivery of Ethiopian Document Authentication and Registration Agency?
2. To what extent does the computer software affect the service delivery of he Ethiopian Document Authentication and Registration Agency?
3. To what extent does the telecommunication infrastructure affect the service delivery of the Ethiopian Document Authentication and Registration Agency?
4. How do databases and data warehouses affect the service delivery of the Ethiopian Document Authentication and Registration Agency?
5. To what extent does the information system competence of the human resource affect the service delivery of the Ethiopian Document Authentication and Registration Agency
6. How does the information system operating procedure affect the service delivery of the Ethiopian Document Authentication and Registration Agency?

1.4 Objectives of the study

1.4.1 General Objective

The general objective of this study is to examine the effect of information system on the service delivery of the Ethiopian Document Authentication and Registration Agency.

1.4.2 Specific Objectives

The specific objectives of this study were to;

1. To examine the effect of the adequacy of the computer hardware on the service delivery of the Ethiopian Document Authentication and Registration Agency.
2. To determine the effect of the computer software system on the service delivery of the Ethiopian Document Authentication and Registration Agency.
3. To analyze the effect of the telecommunication infrastructure on the service delivery of the Ethiopian Document Authentication and Registration Agency.
4. To evaluate the influence of databases and data warehouses on the service delivery of the Ethiopian Document Authentication and Registration Agency.
5. To examine the effect of the information system competence of the human resource on the service delivery of the Ethiopian Document Authentication and Registration Agency.
6. To analyze the influence of the information system operating procedure on the service delivery of the Ethiopian Document Authentication and Registration Agency.

1.5. Significance of the Study

The findings of this study will be expected to be significant for the following important reasons: First, The research findings are going to be used by EFDARA in order to enhance on the quality of information system used in the agency. Second, the study will be helpful to other government organizations, especially public service delivery organization. Third, the finding will be used as a reference for other researchers who are interested to conduct study related this area and it will also add value to those who would like to pursue their research on the significance of using IS on service delivery. Thus, this study attempted to contribute to the body of literature.

1.6. Scope of the Study

As the topic indicates the research revolves around the uses and the effects of information system in Ethiopian Federal Document Authentication and Registration Agency. the nature of data used in the study will be cross sectional and only delimited on the service year and due lack of resource financial and time, the research decided to limit this study to three branches of EFDARA. These branches were selected since they are expected to have more service delivery on lending activities, these are, the first one is Ayer Tena branch which is found in kolfekeraniyo sub city around Ayer tena square, the second is kasanchisbranch which is

found in kirkos sub city on Enat buildingand the third is Gulele branchwhich is found in Gulele sub city on the road to semen mazegajainfront of semen hotel.

1.7. Limitation of the Study

The researcher faced the following limitations; first, financial constraint, insufficient fund tends to impede the efficiency of the researcher in sourcing for relevant materials, literature or information and in the process of data collection (internet, questionnaire and interview). And second, time constraint, the researcher will simultaneously engage in this study with other academic work. This consequently will cut down on the tie devoted for the research work. As a result, the study confined in three branches of EFDARA which are Ayer Tena branch, kasanchis branch and Gulele branch out of fifteen, it will reduce the findings may not be generalizable to all EFDARA's branch.

1.9 Definitions of terms

- **An information system: -** can be defined technically as a set of interrelated components that collect, process, store, and distribute information to support decision making and control in an organization. And also Information systems can be defined as a combinations of hardware, software, and telecommunications networks that people build and use to collect, create, and distribute useful data, typically in organizational settings. (Bourgeois & Smith, 2019)
- **Online information system: -** Web information system, or web-based information system, is an information system that uses Internet web technologies to deliver information and services, to users or other information systems/applications. It is a software system whose main purpose is to publish and maintain data by using hypertext-based principles.
- **Information Technology**: - represents an all-encompassing term for computer workstations linked to computer networks, open systems, client–server architecture, database groupware, and electronic commerce. Together they can simplify a manual-paper based business process for automated business processes (O"Neill and Sohal,1999). It is needed a compromise, limited to those industries which facilitate by electronic means the processing transmission and display of information such as makers of video and movies.
- **Information communication technology: -** may simply be defined as the technologies which enable and support the fundamental processes for the capture, storage,

manipulation, communication and delivery of data and information on different context such as engineering, technological, organizational, social and cultural domains. It is the technology required for information processing by asking se of electronic mechanisms and copter software to convert, store, and protect, transit and retrieve information (Idowu, 2010)

- **Service delivery: -** service delivery is a component of business that defines the interaction between providers and clients where the provider offers a service, whether that be information or a task, and the client either finds vales or loses vales as a result. Good service delivery provides clients with an increase in value.
- **Automated system: -**Automated system is using a system of instructions to execute a repeated set of processes – taking the place of IT work performed manually. Automated processes can increase IT productivity and efficiency – and reduce human errors.

1.10. Organization of the Paper

This paper will have five chapters. The first chapter is an introduction which consists of background of the study, statement of the problem, research questions, objectives, significance, scope and limitation of the study. The second chapter presents review of related literature with respect to the theoretical perspective of IS and empirical studies on IS and the third chapter is research methodology. Data collected from respondents will be presented and analyzed in the fourth chapter, and the last chapter will summary of findings, conclusions and recommendations based on the findings.

CHAPTER TWO: LITERATURE REVIEW

2. Introduction

This chapter is divided into three parts. Theoretical literature review which include all books, journals and articles that were written on the topic of study, Empirical literature review which include findings from other researchers done before and conceptual framework.

2.1 Theoretical Framework

2.1.1 The meaning of Information Systems

Scholars (2007) defines information system as a combination of different components includes hardware, software, telecommunication infrastructure and trained personnel organized to facilitate planning, control, coordination, and decision making in an organization. And an online Information system or web-based information system is an information system that uses Internet web technologies to deliver information and services, to users or other information systems/applications. It is a software system whose main purpose is to publish and maintain data by using hypertext-based principles.

Information systems (IS) involve a variety of information technologies (IT) such as computers, software, databases, communication systems, the Internet, mobile devices and much more, to perform specific tasks, interact with and inform various actors in different organizational or social contexts. Of general interest to the field of IS are therefore all aspects of the development, deployment, implementation, use and impact of IS in organizations and society. However, the IS field is not primarily concerned with the technical and computational aspects of IT. What matters to IS instead is how technology is appropriated and instantiated in order to enable the realization of IS that fulfill various actors' – such as individuals, groups or organizations – information needs and requirements in regards to specific goals and practices. While this is widely recognized in the IS community, the term 'information system', which is foundational to the IS field, is rarely explicitly defined and examined, and is typically taken for granted. This lack of conceptual engagement with 'IS' motivated recent calls to the IS community to further its engagement with core concepts that are central to the field and its research.

Furthermore, this lack of engagement is problematic as it can lead to fuzzy and unclear use of the concept of IS, and can hinder the formulation of a clear identity for the IS field as well. "Whenever IS researchers and professionals have used the term 'information system,' one could substitute the term 'information technology,' 'computer system,' or simply, 'the

computer' where the substitution would often make little or no difference. In retrospect, it is no exaggeration to describe most IS researchers as having used the term 'system' or 'systems' to refer to just about anything that involves electronic information technology". However, such usage of the term is questionable as it blurs the distinction between IT, as one defining notion, and IS as another defining notion of the IS field. It also undermines the importance of human, social and organizational aspects of interest to IS. And finally, conceptual advancements regarding 'IS' as a foundational concept for the field are hampered by the lack of conceptual clarity. If researchers are not clear what they mean when they talk about IS, it is difficult to compare research results and build on each other's work leading to cumulative research tradition.

Information systems generally are classified into five categories: office information systems, transaction processing systems, management information systems, decision support systems, and expert systems. The following sections present each of these information systems.

Office Information Systems

An office information system, or OIS (pronounced oh-eye-ess), is an information system that uses hardware, software and networks to enhance work flow and facilitate communications among employees. Win an office information system, also described as office automation; employees perform tasks electronically using computers and other electronic devices, instead of manually. With an office information system, for example, a registration department might post the class schedule on the Internet and e-mail students when the schedule is updated. In a manual system, the registration department would photocopy the schedule and mail it to each student's house.

An office information system supports a range of business office activities such as creating and distributing graphics and/or documents, sending messages, scheduling, and accounting. All levels of users from executive management to staff members utilize and benefit from the features of an OIS.

The software an office information system uses to support these activities include word processing, spreadsheets, databases, presentation graphics, e-mail, Web browsers, Web page authoring, personal information management, and groupware. Office information systems use communications technology such as voice mail, facsimile (fax), videoconferencing, and electronic data interchange (EDI) for the electronic exchange of text, graphics, audio, and video. An office information system also uses a variety of hardware, including computers

equipped with modems, video cameras, speakers, and microphones; scanners; and fax machines.

Transaction Processing Systems

Transaction processing systems (TPS) are the basic business systems that serve the operational level of the organization. A transaction processing system is a computerized system that performs and records the daily routine transactions necessary to the conduct of the business. At the lowest level of the organizational hierarchy we find the transaction processing systems that support the day-today activities of the business.

Management Information Systems

Management information systems are a kind of computer information systems that could collect and process information from different sources in institute decision- The Role of Different Types of Information Systems in Business Organizations Management information systems Provide information in the form of pre specified reports and displays to support business decision making. The next level in the organizational hierarchy is occupied by low level managers and supervisors. This level contains computer systems that are intended to assist operational management in monitoring and controlling the transaction processing activities that occur at clerical level. Management information systems (MIS) use the data collected by the TPS to provide supervisors with the necessary control reports. According to (Hasan,Y) management information system is type of information systems that take internal data from the system and summarized it to meaningful and useful forms as management reports to use it to support management activities and decision making.

Decision Support Systems

A Decision Support System is a computer based system intended for use by a particular manager or usually a group of managers at any organizational level in making a decision in the process of solving a semi structured decision. Decision Support Systems are Kind of organizational information computerizes systems that help manager in decision making that needs modeling, formulation, calculating, comparing, selecting the best option or predict the scenarios (Heidarkhani, et al). Decision-support systems are specifically designed to help management make decisions in situations where there is uncertainty about the possible outcomes of those decisions(Khanore, et al). A decision support system is a computer-based

information system that assists managers in making many complex decisions, such as decisions needed to solve poorly defined or semi structured problems(Shim).

Expert Systems

Expert systems are the category of AI which has been used most successfully in building commercial applications.Expert systems are Knowledge-based systems that provide expert advice and act as expert consultants to users (O'Brien &Marakas). An expert system is a computer program that tries to emulate human reasoning(Patterson). Expert System is a set of computer programs that perform a task at the level of a human expert (Shim).

2.1.2 The need for information system.

In today's continuously changing and fast moving world, where customers' requirements and preferences are always evolving, the only businesses that can hope to remain competitive and continue to function at the performance levels that can match their customers' expectations are those that are going to embrace innovation. In the recent past, any business success has been pegged on the information technology quality that the business has employed and the capability to correctly use such information.

Information systems (IS) importance has increased dramatically, and most businesses have been prompted to introduce it to keep their competitive edge. Today, nobody can envisage a business without an effective information system. Introduction of an information system to a business can bring numerous benefits and assist in the way the business handles its external and internal processes that a business encounters daily and decision making for the future. Some of the benefits of an information system include:

New Products and Services

Any company looking to improve and secure the future has to establish a broader perspective with the use of a well-designed and coordinated information system. The IS makes it easier to analyze independent processes such as information to produce valuable products or services and organized work activities. Therefore, an IS can give a company the competitive advantage by analyzing how a company creates, produce, and sell their products or services. This means that the focus will be put on the main goal ahead.

Information Storage

Every organization needs records of its activities to find the cause of problems and proper solutions. Information systems come in handy when it comes to storing operational data, communication records, documents, and revision histories. Manual data storage will cost the company lots of time, especially when it comes to searching for specific data. A quality information system stores data in a comprehensive and sophisticated database which makes the process of finding it convenient. With such information, a company can analyze how certain actions affected the business as well as prepare cost estimates and forecasts.

Easier Decision Making

Without an information system, a company can take a lot of time and energy in the decision making process. However, with the use of IS, it's easier to deliver all the necessary information and model the results and this can help you make better decisions. The management team can use the information system to choose the best course of action and carry out the tasks. When there are several appealing alternatives, the information system can be used to run different scenarios by calculating key indicators such as costs, sales, and profits. This way, you can determine the alternative with the most beneficial results.

Behavioral Change

Employers and employees can communicate rapidly and more effectively with an information system. While emails are quick and effective, the use of Information systems is more efficient since documents are stored in folders that can be shared and accessed by employees.

This implies that information flows from the management to lower-level employees and vice versa. Also, the lower-level employees get enlightened and involved in important decision making, and this eliminates the need for middle managers. Employees who are directly involved in the decision-making process are motivated and dedicated to their tasks.

2.1.3 Computer software

The computer will not work without software. Software, also call programs, are the instructions that tell the computer what to do and how to do it. Software is a set of instructions, data or programs used to operate computers and execute specific tasks. It is the opposite of hardware, which describes the physical aspects of a computer. Software is a

generic term used to refer to applications, scripts and programs that run on a device. It can be thought of as the variable part of a computer, while hardware is the invariable part.

The two main categories of software are system software and application software. The system software also called the operating system (OS) actually runs the computer and it is designed to run a computer's hardware and provides a platform for applications to run on top of. This software controls all the operations of the computer and its devices. All computers use system software and without the system software the application software will not work. The most common OS on a PC is the Windows operating system and for the Mac computer it would be the Mac operating system. And on the other hand, application software is a program that allows users to a specific task on the computer and also it is software that fulfills a specific need or performs tasks. There are a number of different types of application software available to do many of the tasks we do daily. Some examples of common application software are: Word Processing Application, Spreadsheet Application, E-mail Application and Internet Application:

Other types of software include programming software, which provides the programming tools software developers need; middleware, which sits between system software and applications; and driver software, which operates computer devices and peripherals.

Early software was written for specific computers and sold with the hardware it ran on. In the 1980s, software began to be sold on floppy disks, and later on CDs and DVDs. Today, most software is purchased and directly downloaded over the internet. Software can be found on vendor websites or application service provider websites.

2.1.4 Computer Hardware

Computer Hardware is the physical part of a computer, as distinguished from the computer software that executes or runs on the hardware. The hardware of the component could be either an electronic, electrical, and mechanical component used in the computer system. The hardware of a computer is infrequently changed, while software and data are modified frequently. The term soft refers to readily created, modified, or erased. These are unlike the physical components within the computer which are hard.

When you think of the term computer hardware you probably think of the guts inside your personal computer at home or the one in your classroom. However, computer hardware does

not specifically refer to personal computers. Instead, it is all types of computer systems. Computer hardware is in embedded systems in automobiles, microwave ovens, CD players, DVD players, and many more devices.

2.1.5 Telecommunication Infrastructure

Telecommunications are the means of electronic transmission of information over distances. The information may be in the form of voice telephone calls, data, text, images, or video. Today, telecommunications are used to organize more or less remote computer systems into telecommunications networks. These networks themselves are run by computers.

It is a physical medium through which all Internet traffic flows. This includes telephone wires, cables (including submarine cables), satellites, microwaves, and mobile technology such as fifth-generation (5G) mobile networks. Even the standard electric grid can be used to relay Internet traffic utilizing power-line technology. Innovative wireless solutions like Internet balloons and drones are also gradually being deployed. Telecommunications infrastructure services provide setup, maintenance, and consulting for data and voice communications technologies.The Internet, therefore, is a giant network connecting devices across geographical regions.

2.1.6 Database and data warehousing

Database

A database is a systematic collection of data. They support electronic storage and manipulation of data. Databases make data management easy.Let us discuss a database example: An online telephone directory uses a database to store data of people, phone numbers, and other contact details. Your electricity service provider uses a database to manage billing, client-related issues, handle fault data, etc.

Let us also consider Facebook. It needs to store, manipulate, and present data related to members, their friends, member activities, messages, advertisements, and a lot more. We can provide a countless number of examples for the usage of databases.

There are five main components of a database:

- **Hardware:** The hardware consists of physical, electronic devices like computers, I/O

devices, storage devices, etc. This offers the interface between computers and real-world systems.

- **Software:** This is a set of programs used to manage and control the overall database. This includes the database software itself, the Operating System, the network software used to share the data among users, and the application programs for accessing data in the database.
- **Data:** Data is a raw and unorganized fact that is required to be processed to make it meaningful. Data can be simple at the same time unorganized unless it is organized. Generally, data comprises facts, observations, perceptions, numbers, characters, symbols, images, etc.
- **Procedure:** Procedure is a set of instructions and rules that help you to use the DBMS. It is designing and running the database using documented methods, which allows you to guide the users who operate and manage it.
- **Database Access Language:** Database Access language is used to access the data to and from the database, enter new data, update already existing data, or retrieve required data from DBMS. The user writes some specific commands in a database access language and submits these to the database.

Data warehousing

A data warehouse is a large collection of business data used to help an organization make decisions. The concept of the data warehouse has existed since the 1980s, when it was developed to help transition data from merely powering operations to fueling decision support systems that reveal business intelligence.

In computing, a data warehouse (DW or DWH), also known as an enterprise data warehouse (EDW), is a system used for reporting and data analysis and is considered a core component of business intelligence. DWs are central repositories of integrated data from one or more disparate sources.

A Data Warehousing (DW) is process for collecting and managing data from varied sources to provide meaningful business insights. A Data warehouse is typically used to connect and analyze business data from heterogeneous sources. The data warehouse is the core of the BI system which is built for data analysis and reporting.It is a blend of technologies and components which aids the strategic use of data. It is electronic storage of a large amount of

information by a business which is designed for query and analysis instead of transaction processing. It is a process of transforming data into information and making it available to users in a timely manner to make a difference.

2.2. Review on Empirical Studies

2.2.1. Telecommunication infrastructure and service delivery

Telecommunication infrastructure development got a great attention of researcher in many years. Zhu (1996) attempted to examine the causal relationship running from telecommunications investment to economic development only using a pooled time series analysis based on 17 years data from 23 countries, and found telecommunications investment countries, and found telecommunications investment countries, Madden and Savage (1998) analyzed the relationship between telecommunications infrastructure investment and economic growth by taking a sample of transitional economies in Central and Eastern Europe. The study showed that overall, there appears to be two ways, or mutual causality between telecommunications investment and real economic growth at the aggregate level. Boylaud and Nicoletti (2000) used factor analysis and panel data analysis to examine the effects of market entry;liberalization and privatization on productivity, prices and quality of service in long-distance fixed-line and in mobile telephony in 714 Zahra, Azim, and Mahmood several OECD countries. In another study, Li and Xu (2001) examined the impact of privatization and competition on fixed-line subscriptions, labor and factor productivity in the telecommunication industry worldwide. A study of Yilmaz, et al. (2001) indicated that the accumulation of telecommunication infrastructure improves the overall productive capacity at the regional level by examining the impact of telecommunications infrastructure on economic output both at the aggregate and sector levels in the United States. Wallsten (2002) used data on telecommunication industry worldwide to analyses whether the sequence of reforms matters. Fink, et al. (2002) used data on 86 developing countries worldwide to analyses the impact of telecommunication policy reforms on industry performance.

Ding and Haynes (2004) empirically investigated the role of telecommunication infrastructure in long run regional economic growth in China for a sample of 29 regions for a 17 years' period, from 1986-2002. With a panel dataset, they used a dynamic fixed effects model for estimation, which allows testing the relationship between regional economic growth with initial economic condition, fixed investment, population growth, as well as

telecommunications infrastructure. On the basis of the results, they showed that telecommunications is both statistically significant and positively correlated to regional economic growth in real GDP per capita in China. The results were strong even after controlling for investment, population growth, past levels of GDP per capita, and lagged growth. They further indicated that the telecommunication investment is subject to diminishing returns, suggesting in this manner that regions at an earlier stage of development are likely to gain the most from investing in telecom infrastructure.

The result has been confirmed by more recent analysis of information system by Datta and Agarwal (2004) which indicates that telecommunications infrastructure plays a positive and significant role in service delivery using a similar (but not identical) data set as Roller and Waverman, which includes 22 OECD countries. A dynamic panel data method is used for estimation, which corrects for omitted variables bias of single equation cross-section regression. Again, country-specific fixed effects are included. Their results showed a significant and positive correlation between telecommunications infrastructure and service delivery, after controlling for a number of other factors.

2.2.2 Information system and Performance of Organisations

An information system (IS) in an organization is like the nervous system in the human body: it is the link that connects all the organization's components (human resource, marketing, accounting and finance, operations (i.e. production and service) etc.) together and provides for better operation and survival in a competitive environment. Indeed, today's organizations run on information (Dandago, 2012)

In the 1960's and 70's, information technology was widely employed by many firms mainly for achieving routine clerical and administrative activities such as processing data related to bookkeeping and accounting activities (Bird &Lehrman, 1993). It was used as a monitor of the firm's internal and external environment; in other words, as a support factor for the other organizational system components (Blili& Raymond, 1993). However, the cost, the distribution, and the fact that it was generally applied to only simple tasks in its early stages discouraged its application to strategic uses in areas such as enhancing the organization’s position against competitors, moving into new markets, and providing managers with better information for effective decision making. The advancement in the technological field along with other advancements have enhanced the economies of information technology and greatly expanded its applications (Bird &Lehrman, 1993).

Moreover, Managers need rapid access to information to make decisions about strategic, financial, marketing and operational issues and they are successfully handle information and applied it when making decisions. They see information as valuable asset, creation of information ethos is one part of ongoing process, and those companies which have successfully implemented change and created an information ethos have done so with the backing and leadership of the senior managers, and the CEO in particular (Owens et., al 1995).

Timely availability of relevant information is vital for effective performance of managerial functions such as planning, organizing, leading, and control. An information system in an organization is like the nervous system in the human body: it is the link that connects all the organization's components together and provides for better operation and survival in a competitive environment. Indeed, today's organizations' managers run on information (Ibid). (Turban, 2001) Information systems affect individuals in various ways. An IS has great contribution to complete career effectively, to reduce error, reduce time to search documents, enhance productivity and supply quality information to make decision and to set plan (short term and long term). (Baker, 1993), Each day computers help millions of people do their jobs more effectively. By using facts supplied by computers that are timely, relevant, and accurate, a manager can do a better job of identifying problems, opportunities, and solutions.

Today, information system has become not only a tool to process data and record transactions, but also a competitive weapon that can change an industry's structure. Galliers (1994) suggested that because of the rapid pace of technological advances and the impact of information technology on the changing competitive environment, organizations are forced to critically evaluate their management of information and technology resources in order to achieve their strategic objectives. One of the strongest evidences of the impact of IT has been illustrated as coming from the firmlevel analysis that is confirmed to a number of developed countries (OECD, 2003). Most of these studies use a combination of growth accounting methods and econometric models to examine samples of industries and firms. For example, (Gretton, 2002), studying firm-level data from the Australian Business Longitudinal Survey, found positive and significant links between the use of IT and growth in both manufacturing and service industry. (Brynjolfsson&Hitt, 2003), investigating US firm-level data, proved that IT has a solid impact on productivity. (Pilat&Wolfl, 2004) examined the role of ICT-producer and key ICT-consumer sectors in explaining overall productivity growth in OECD (Organization for Economic Co-operation and Development) countries; they found that the

impact of ICT-producer sectors is most significant in Finland, Ireland, and Korea whereas ICT-consumer sectors in some countries, remarkably US and Australia, had an impressive growth in the second half of the 1990s. (Hempell, 2004) analyzed comparable panel data of the Dutch and German firms in the service industry and found that ICT capital deepening and innovation have complementary impact on productivity.

The Massachusetts Institute of Technology group in 1991 concluded that information technology is the platform on which success can be built but organizational factors are crucial to realizing the benefits of automation and `informating' process (Morton, 1991; Zuboff, 1988). Information technology can be considered to be a series of innovations. Even though the innovations provide organization with new and different ways of solving problems and enhancing performance, there is still a great deal of research to be done and discussion among researchers and organizational theorists on how innovations should be implemented and managed and how they affect organizations on different levels.

It is widely accepted among many authors and researchers in the organizational field that information technology has a significant effect on the performance of the organization's activities (Bhattacherjee&Hirschheim, 1997; Morris & Westbrook, 1996; Porter & Millar, 1985). For example, information technology applications can be used to improve the level of efficiency of administrative functions in an organization and to enhance the effectiveness of managerial activities. These applications also can be used as tools to impose better organization on tasks and to provide better information to managers. Zuboff (1988) pointed out that information technology applications are strongly altering the way in which production operations are carried out in a 13 variety of industries and thus using information technology to create and acquire a competitive advantage.

2.2.3Information system in Ethiopia

Because of the wide range of choices, there is a need of information system specialists which focus on integrating computing technologies and business processes to meet organizational needs. These specialists need to be mainly engaged in solving the problems associated with the organization issue and information systems. The discipline focuses on uses of the technology as a tool for processing, storing and distributing information.

Despite the fact that Information Systems as a profession was given in some countries since decades ago, the field is too young in our country. The government of Ethiopia is now

aggressively embarking on the introduction and expansion of the ICT sector as a tool for the country's development. Therefore, to get what is expected from the sector, having well trained Information Systems professional on the Information Systems discipline is believed as a core activity.

Until recent years, there were no institutions that train Information Systems professionals except Addis Ababa University, which had launched the Information Systems program in 2002 at B.Sc. level. Currently, the program is being offered by some private institutions in addition to the government owned universities.

Organizations in Ethiopia are becoming larger and larger and are in a position to need IS professionals to help the management of information to promote their products and services. In line with the Ministry of Education's mission, vision and values, universities need to work on a nationally harmonized curriculum of Information Systems to address the requirements of organizations.

2.2.4 EFDARA Online information systems.

EFDARA Online Information systems (IS),is a web based system that will enable applicants to register and request authentication of documents online without stepping into the doors of the agency. The agency records and authenticates contractual agreements and power of attorney documents created by individuals and organizations. And this will enables the agency to get uniform, accurate and quality information from applicants. The online information system is one of data processing and communication tools. The purpose of introducing these systems, were to produce accurate, reliable and timely information and services. The process meant to enhance accessibility and availability of data, which are collected from stakeholders related to EFDARA functions.

Also, (IS) intended to meet the challenges happening on delivering quality services towards customers competitively. For example, at a broad level, (IS) expected to become one of key components in achieving the organization's mission (Drury &Farhoomand, 1998). But, in a narrow scope the (IS) concentrating on productivity and facilitate service delivery among stakeholders (Brown, 1999). Even though a cursory examination of the IS has a numerous challenges to meet individual organizations expectations towards the stakeholders. One of the available literatures suggesting critical examination on IS utilization against its success (Hwang, Windsor, & Pryor, 2000). Whereby, the organizations make fully utilization of its stakeholder's idea and existing opportunities.

2.2.5 The Public Sector demand on services offered through EFDARA information systems.

The term public sector refers to "enterprises which the Government, State/Territory and local governments, separately or jointly have control over. It includes local government authorities and all government departments, agencies and authorities created by, or reporting to, the Government. It also includes public trading enterprises. The sector has a unique purpose since "government serves all citizens through the exercise of its powers, authorities and roles, including those who are direct recipients of its services. Hence, EFDARA information systems are among the Governments service channel. It's therefore responsible to meet public demands, in association with other public actors.

Therefore, Public sector organizations need to examine efficiency of services offered and its consequences (Dowse, 2003). For example, The EFDARA agency that introduced technology based schemes in its operation about nine years ago by using online registration process, now applied a Quick Response code (QR code) in its document authentication and registration operation. So the new system will play a big role to tackle forgery and safeguard citizensfrom illegal actors. The new QR code that is printed at the original authenticated document will be readable by QR code reader. The new scheme will cut back forgery allegation. In the past anyone who have a fake ID will try to get for instance power of attorney and may use forged document and abuse and right and property of others without their knowledge, but the current QR code for instance will help organizations like banks to re-verify the document by their own, in the past banks assigned their staff and send them at EFDARA to authenticate the documents, which takes time and money, but the new system will cut this.

2.2.6 Competence of human resource

The role that human resource development plays in the advancement of public service delivery is very important. It is essential that every public sector have human resources that know their personnel function as it is defined as a group of activities that are responsible for the provision, utilization and maintenance of adequate personnel for effective service delivery. Typically, activities in the human resource management include aspects such as recruitment, selection, training, placement, evaluation and remuneration of personnel. It is important that civil servants training be developed for the advancement of public service. Armstrong (2006) in Boohene (2011:268) indicates that HRD invests in people in order to enable them to perform well and empower them to make the best use of their natural abilities. Furthermore, Public Service Commission (2011) accentuates that there should be an evaluation of training and development initiatives in government departments by measuring

the effectiveness both in terms of realizing the components outputs and the departments' strategic objectives as well as measuring improvement of employee competence in crucial in an organization.

It is thus important to indicate that if there is management of human resources in municipalities, there will be diverse competent and well managed workforce that is capable of and committed to delivering high quality services to the people of South Africa. It is also necessary for the human resources in municipalities to be committed to their work by providing services to the people at the right time rather than being forced to provide those services. Furthermore, Chlivickas (2015:13) stipulates that it is important to improve the capabilities of human resources and of the public sector at large in order to transform the contemporary society, with priorities to be set for intellectualization, ability to react to increasingly rapid changes, adaptability and competitiveness. From the concept Human Resource Development, the development of human resources in the public service stresses that if public service officials are well trained, there will be effective provision of services this is because the effective provision of services revolves around the training of public service officials. Rao, 1990; in Mohanty, (2016:323) indicates that employees in every organization or institution are the most important and valuable resources and their development can help the organizations or an institutions realize their objectives by creating a competent, dynamic and motivated employee force.

2.3 Conceptual framework

An information system is technically as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organization. In addition to supporting decision making, coordination, and control, information systems may also help managers and workers analyse problems, visualize complex subjects, and create new products.

As organisations grow and change, they depend more and more on the use of information systems for their survival (Feeny&Willcocks, 1998). Companies today implement and use information systems to find solutions to business problems, to improve management decision-making, enhance productivity and quality, and compete for new markets in our global and aggressive business environment (Porter & Millar, 1985). Moreover, IS can be seen as a powerful force that opens exciting opportunities for organisations to achieve their missions and goals in an effective way. Therefore, leaders in organisations must obtain an

overall appreciation of the potential of IS and link the acquisition and utilization of IT to the organizational mission (Hacker & Saxton, 2007).

2.3.1 Service Delivery

Service delivery is all about the customer service and effectiveness. Effectiveness in customer service means doing the right things and measures indicators like customer satisfaction, via speed, service quality, timing, and human interaction. A service is effective when its results are valid to the customers. Information system help to build new and better service delivery by rising transparency and efficiency, and enhancing the coordination of public sector procedures and management.

It has been well known that when a service provider meets and exceeds customer expectations then the customer is satisfied. Johnston, stated that when customers receive quality services they are usually pleased and in turn create a closer association flanked by the purchase and the seller. Most firms in the service industry have their own research and development departments projected to examine the quality of service that leads to customer satisfaction. These departments are planned to support management to discuss services provided and report building proposals effectively. They provide vital information which is used to direct effort in decreasing unpredictability in value of the service and to offer customers the services needed to make certain their unrelenting support. These are key rudiments in customer service and providers of IS services ought to give more attention and thus resolving problem on time.

Quality of work is measured by the indictor of meeting or exceeding the standard that is set by the organization. Speed of work achievement is measured by the indicator of the time length of work accomplished. In an Information system context when we measure the effectiveness, we are basically measuring the capacity of the outputs of information systems or of an IT application to fulfill the requirements of the firm and to attain its objectives, making this firm more competitive. In the same IS context the efficiency is the measurement of how inexpensively can you get things done, and are the customers to whom you provide IS services happy with the quality and ease of service delivery being offered? And does it reduced the operational expenses?. Various studies have been undertaken to measure the impact of IS on management performance (efficiency and effectiveness) of business organizations using different performance constructs. These components explain all activity

levels and performance indicators common to all units and cover the full variety of resources used. These components consist of customer satisfaction, income, supplier/customer links, firm image, confidence, job interest of workers, stakeholders' and inter-office links.

In this study the researcher will evaluate the effect of information system on service delivery after Information system implementation and utilization by comparing it to the previous service delivery level of the documents authentication and registration agency and its effect on overall employee's satisfaction. Models and frameworks have been proposed in literature for undertaking information system. It is noticed that some of these have very limited focus; while others are more generic, yet, mainly theoretical in nature. Moreover, most of these frameworks address the success of using information system components on service delivery. Moreover, the suitability of the automating method to the organizational context is of great significance. While automating services could benefit manufacturing and service firms, there should be a distinction in its implementation to suit the unique situation of the firm (Shin and Jemella, 2002).

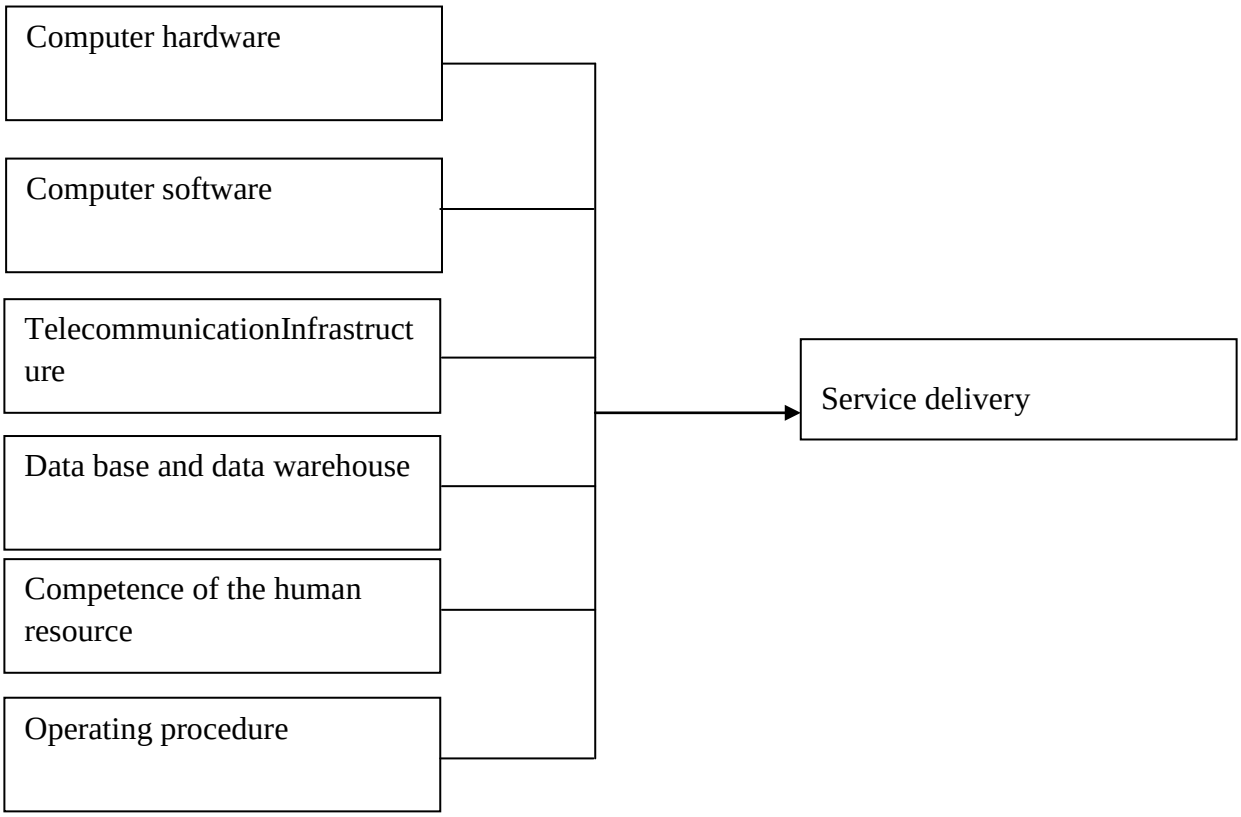

Figure 2.1: Conceptual framework
Source: Adapted from Nada IsmaeelJabbouri. (2015, p. 5). Impact of Information Technology Infrastructure on Innovation Performance: An Empirical Study on private Universities in Iraq

2.4 Summary of Literature Review

There is a great deal of agreement among researchers that quantifying the effects of information system on service delivery is a very difficult process. There is no accepted measure among researchers and scholars for management productivity. Direct physical measures of outputs and inputs provide an alternative metric that permit process-specific comparisons of manufacturing performance associated with alternative technological choices and organizational designs (Mitchell & Stone, 1992).

A useful framework for analyzing the strategic significance of information system has been provided by Porter and Millar (1985). They introduced the concept value chain which explains how and why the information system is changing the way organizations work from inside as well as changing the relationship between organizations and their suppliers, customers and competitors. Although Information system is being adopted in many organizations, assessment of its appropriateness and effects on service delivery of the organization has not been fully understood. Based on this, the study seeks to determine the extent to which Ethiopian federal documents authentication andregistration agency practices had successfully implemented and utilized the information system in their organization,and how the system has brought dramatic changes on service delivery.

CHAPTER THREE: RESEARCH METHODOLOGY

3. Introduction

This chapter outlines the research methodology which was employed in the study. The chapter provides a description of various techniques including research design, target population, sampling procedure and sampling methods, data collection tools and methods and ethical considerations which were observed in the study. The study focused on two branches of Ethiopian federal document authentication and registration agency as service delivery.

3.1. Description of the study area

Ethiopian Federal Document Authentication and Registration Agency (EFDARA), is the Federal Institution, and an institution to be established by a regulation of the Council of Ministers to centralise the work and data; as well as do the work of authentication and registration in Addis Ababa and Dire Dawa. Currently, the Agency has a total of 15 branches including 14 in Addis Ababa and one branch in Dire Dawa and the study area is focused on three branches: Ayer Tena branch,kasanchis branch and Gulele branch.

3.2. Research approach

The effect of using information system on service delivery was cross-sectional study as it sought to describe data and characteristics about the population or phenomenon being studied. In this study, a combination of qualitative and quantitative approaches of doing research was used, which has been practiced, as recommended by Creswell (2009).By mixing both quantitative and qualitative research and data, the researcher gains in breadth and depth of understanding and corroboration, while offsetting the weaknesses inherent to using each approach by itself. One of the most advantageous characteristics of conducting mixed methods research is the possibility of triangulation, i.e., the use of several means (methods, data sources and researchers) to examine the same phenomenon.

The reason for preferring a cross-sectional study was due to the vast nature of the study and the limitation of time. And obtaining information from a cross-section of a population at a single point in time is a reasonable strategy for pursuing many descriptive researches (Janet, 2006).

3.3 Research Design

This research project adopted both a descriptive and explanatory survey design. Descriptive surveys are used to describe a behavior of a given subject and explanatory survey were used to explaining the aspects of your study.

The effect of information systems in Ethiopian federal document authentication and registration agency in Addis Ababa were investigated thoroughly. Case studies typically combined data collection techniques such as observation and questionnaires were used. Appropriate single-case study that represents a critical case (meets all the necessary conditions for testing a theory) was also used. Therefore the researcher uses both a descriptive and explanatory survey design case study research design.

3.4. Sample Size and Sampling Procedure

3.4.1 Population of the study.

To study the effects of information system on service delivery, the study population constitutes the service providers (management team) and employees of the agency. The population targeted for the study comprised of about 85 employees and managers from three branches; Ayer Tena branch, kasanchis branch and Gulele branch.This branches are selected because these branches are expected to have more service delivery on lending activities, location and number of customers is high. This population was considered for thereason that there was no enough time and money to conduct research in those other branches.

Table 3.1: categories of expected respondent and sample size

Categories of expected Respondents	Sample size of the selected branch			Total
	Gulele	Kasanchis	Ayer Tena	
Employees	24	34	24	82
Managers	1	1	1	3
Total	25	35	25	85

Source: Own Survey, 2021

3.4.2 Sampling Technique.

The representative population is selected from three branches;Ayer Tena branch, kasanchis branch and Gulele branch,of the agency and Census technique was selected while a census is an attempt to gather information about every member of the population or in our case the employees. The major reasons for limiting the scope are clearly stated under the scope of thestudy and it is due lack of resource financial and time, the research decided to limit this study to three branches

3.5. Data Collection Methods and Source of Data

The study used primary source of data and it was collected from members of employees of the selected branches of EFDARA and it was collected through a questionnaire and observation. The questionnaire had two sections, the first part captured demographic information of the respondent and the second part entailed the effects of using information systems on service delivery. The questionnaire is anonymous as no personal information of the respondents is collected.

Direct personal observation of the agency' operation was also done using an observation check list to look at the actual services provided to customers to measure how information system is implemented for services delivery. All these methods of data collection are used to collect primary data for the study on the IS status in the agency.

3.6. Reliability and validity

Bless &Higson-Smith (2016) highlight that reliability is "concerned with the consistency of measures", thus, the level of an instrument's reliability is dependent on its ability to produce the same score when used repeatedly.

For the reliability of the questionnaire the researcher and subject matter experts were used to review the questions and categories listed in the original survey instrument. Moreover, the questionnaire was distributed to all members of selected branches of employees and managers and it was tested using the Cronbach's Alpha weather it is below or above 0.7. According to Bryma& Bell (2003), the Cronbach's Alpha result of 0.7 and above implies acceptable level of internal reliability.Hence, the findings indicated all constructs considered in the questioner for this study was reliable. The following table shows the summary of reliabilities of all variables under the questioner.

Table 3.2: Reliability Statistics

VARIABLES	NUMBER OF ITEMS	CRONBACH'S ALPHA
Computer Hardware	2	0.949
Computer software	4	0.874
Telecommunication Infrastructure	3	0.861
Data base and Data Warehousing	3	0.887
Information system operating procedure	3	0.861
Information system competence of the human resource	3	0.914
Service Delivery	4	0.812
Overall reliability	22	0.935

Source: Questionnaire Survey, 2021

Validity on the other hand refers to whether an instrument actually measures what it is supposed to measure, given the context in which it is Applied (Bless &Higson-Smith, 2016). Malhotra (2010) mentioned about three types of validity in his study: content validity, predictive validity, and construct validity. This study addressed content validity through the review of literature and adapting instruments used in previous research.To assure validity, questionnaires were designed on the basis of previous studies' questionnaires and review of related literatures.

3.7. Method of Data Analysis and Presentation

Data that obtain from collecting questioner were analysed using Statistical Package for Social Sciences (SPSS) program through a descriptive statistic to provide details concerning effects of private manufacturing investment on local economy. Data from questionnaires were summarized, edited, coded, tabulated and analysed. Qualitative and Quantitative analysis will be used as data analysis technique. Primarily the data was collected through the questionnaires and analyzed by using descriptive statistics for responses to be obtained by using Likert scale method, open-ended and closed questions and then tabulated, coded and analyzed to present the research findings. Result would be presented using figures, frequency, and mean.

The regression model equation was:

$$Y = \alpha 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \varepsilon$$

Where:

Y = Effects of information system on Service Delivery

α_0 = Constant

β = Determines the relationship between the independent variable X and the dependent or Gradient/Slope of the regression measuring the amount of the change in Y associated with a unit change in X.

X1 = Computer Hardware

X2 = Computer Software

X3 = Telecommunication Infrastructure

X4 = Database and Data Warehousing

X5 = Information system operation procedure

X6 = Information system competence of human resources

ε = The Error term which accounts for other unobserved factors that may have an effect on local economy

3.8. Ethical Clearance

The researcher may try to develops-informed voluntary participation and consent of the respondents before they engage in the research. Protect the privacy of the participants-confidentiality (respondents are ensuring that personal information will be making available to anyone who is not directly involved in the study). The respondents will remain anonymous throughout the study. Data need to be keeping for a reasonable period of time (5-10 years). In the interpretation of data, researchers provides an accurate account of the information and will not use language or words that are biased against persons because of gender, sexual orientation, ethnic group, disability, or age.

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION

4.1. Introduction

This chapter presents the major findings of the study. Arising from the data collected through the survey questionnaires and observation, the research results for EFDARA are analyzed,compared and presented in this chapter. The researcher conducted a preliminary pilot testingbefore the actual survey was administered to identify potential problems in the measurementinstrument and to evaluate the preliminary validity and reliability of the questionnaire. Thesurvey instrument was checked by having senior stuff of my organization and with (information teams) of the case agency. These experts gave their verbal and written feedback on the instrument. A common concern was on the format, wording and clarity of the questions. Based on their constructivefeedback, some changes were made on the instrument, including the grouping of similar questions together under the same section and simplifying wordings are satisfactory.

4.2. Response Rate

The data for this study was collected from the managers and non-managerial staff (i.e., employees) of the Ethiopian Federal Documents Authentication and Registration Agency in Addis Ababa. The relevant questionnaires were filled in by researcher. Furthermore, an attempt was made to increase the response rate by reminding the employee respondents of the survey through personal distributing extra questionnaires to them. The following table shows the results.

Table 4.1: Response Rate

Response	Employees and managers
Number of distributed questionnaire	85
Returned and usable Questionnaire	78
Usable response rate based on sample required	91.76%

(Source:Survey result, 2021)

As a result of this effort, out of the 85 questionnaires distributed by hand delivery through the researcher to the respondents of the selected branch office of the agency located in the Capital city, Addis Ababa, a total of 78 questionnaires were returned. This made a response rate of 91.76%. This response rate is considered adequate considering that, according to Sekaran (2006), the response rate of 70% is acceptable for surveys.

4.3. Respondents' Background information

The frequency table of the demographic characteristics of all the respondents is shown intable 4.2.

Table 4.2: Demographic characteristics of the respondents

Demographic Profile (N=78)		Staffs (Employees and managers)	
		Freq.	Percent
sex	Male	37	47.43
	Female	41	52.57
	Total	78	100
Age	Below 20 years	0	0
	21 -30 Years	19	24.36
	31- 40 years	28	35.9
	41-50 years	25	32.05
	Above 50 years	6	7.69
	Total	78	100
Educational level	Secondary education	0	0
	Certificate/diploma	18	23.07
	Bachelor /degree	44	56.41
	Masters	16	20.52
	Doctorate	0	0
	Total	78	100
Job title of staff	Senior management	3	3.85
	Subordinate	72	92.30
	Total	78	100
working experiences	Less than 5 Years	7	8.98
	5-10 Years	15	19.24
	11-15 Years	32	41.02
	16-20 Years	23	29.48
	20 Years and above	1	1.28
	Total	78	100

(Source: Survey result, 2021)

A. Sex:-According to Figure 4.2, the descriptive analysis indicates that majority of therespondents were female (52.57%) while male respondents were 47.43%. This means that themajority of respondents were female. (Stuff only)

B. **Age Group**:-Table 4.2 indicates that 91.46 % of the employee and managementsrespondents were between the ages of 20 and 50. Hence, these respondents representedthe above average of the targeted members of the study population - who were within theyoung age groups of the people who were supposedly important instruments for effectingchange.

C. Education: -In terms of educational levels of staff, as shown in table 4.2, below 65.3% of employee and managements respondents had the first and second university degrees. This again helps one to consider that the respondent's assessment would be fair and critical.

D. Job title: - In terms of job title (current position of the respondents in the agency) of the employee and management respondents, 3.9% were holding the responsibility of branch managers and deputy branch managers, 63.3% special salary paid which are front makers. This shows that the respondents were from different job categories with higher customer contact positions and were knowledgeable and had first-hand information about the IS effects.

E. Years of Work Experience:-In terms of years of work experience with the agency,
Figure 4.2 indicates that, as employees, more than 92% of them had more than 5 years of work experience with the agency. This makes the responses of the respondents more valuable; as IS had been implemented in 2009, the respondents knew the changes before and after the IS implementation in the respective agency.

4.4. Response from Closed Ended Questions

The respondents were asked to give their perceptions on the IScomponents and IS effect on the service delivery to the agency.

4.5. Analysis for the Independent Variables

a) Independent Variables Analysis Based on Frequency and Percent

The assumptions stated in the frame work of this study articulates that efficient and effective service delivery in Ethiopian Federal Document Authentication and registration Agency is measured through the existence of Six independent variablessuch as availability of computer hardware, availability of computer software, availability of telecommunication infrastructure, database and data warehousing, competence of human resource and operational procedure stated above. Table 4.3 up to 4.10demonstrates the frequency statistics (frequency and percent) for the independent variables based onthe five point Likert scale model with 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and5=Strongly Agree as indicated below.

V.No.1: Computer hardware.

Computer hardware is represented with two individual questions. Hence, the presentation of data via frequency statistical analysis is as indicated below in table 4.3. Associated with

theadequacy ofcomputer hardware in EFDARA, from 78 collected responses 3(3.84%) were Neutral, 54(69.23%) were Agree and 21(26.92%) were Strongly Agree. From this data we learned that 96.15% of the respondents were accept the adequacy of computer hardware in the agency. Therefore, currently there is enough computer hardware exists in EFDARA significantly at 96.15% (Agree).

Related to the specification of the computer hardware is enough to perform the tasks of the agency, from 78 collected responses 27(34.61%) were Neutral, 24(30.78%) were Agree and 27(34.61%) were Strongly Agree. From this data we learned that 65.39% of the respondents were accept the specification of the computer hardware is enough to perform the tasks of the agency. Therefore, specification of the computer hardware is enough to perform the tasks inEFDARA significantly at 65.39% (Agree).

Table 4.3: Frequency table for the computer hardware

V.No.1: Computer Hardware.						
Descriptions	N	Scale	Frequency	Percent	Mean	Std. Deviation
There is enough and adequate computer hardware that can serve the whole agency employees in the branch.	78	Neutral	3	3.84	3.97	0.755
		Agree	54	69.23		
		Strongly Agree	21	26.92		
		total	78	100		
Computer hardware's specification is enough to perform all the tasks.	78	Neutral	27	34.61	3.83	0.828
		Agree	24	30.78		
		Strongly Agree	27	34.61		
		total	78	100		
				mean of mean	3.9	

(Source:Survey result, 2021)

V.No.2: Computer Software

The availability of computer software is represented by four questions. Hence, thepresentation of data via frequency statistical analysis is as indicated below in table 4.4.Related to the first question with the software is user-friendly and easy to use, from 78 collected responses 14(17.94%) were Neutral, 29(37.18%)were Agree and 35(44.88%) were Strongly Agree. From this data we learned that 82.06% of therespondents were accepted the ease to use and user friendly of the software. Therefore, 82.06% of the employees and managers agreed on the software are user-friendly and easy to use.

Aligned with the Use of computer software facilitate a better and quality service delivery to EFDARA customers, from 78 collected responses 37(47.43%) were Neutral and 41(52.57%) were Agree. From this data we learned that 52.57% of the respondents were accepted the Use of computer software facilitates a better and quality service delivery to EFDARA customers.

Whereas, the remaining 47.43 % werereplied in between disagree and agree. Therefore, currently 52.57% of the Use of computer software facilitates a better and quality service delivery to EFDARA customers.

While the Use of Software application ensures reducing time complete the work and the exchange of information, from 78 collected responses 24 (30.76%) were Neutral and41(52.56%) were Agree and 15(19.23%) were Strongly Agree. From this data we learned that 71.79% of the respondents were accepted Software application ensures reducing time complete the work and the exchange of information in the agency. Therefore, currently 71.79% of the software reduces time complete the work and the exchange of information.

And on the fourth question, use of computer software has facilitated better communication with its beneficiaries and partners, from 78 collected responses 54(69.23%) were Agree and 24 (30.76%) were strongly. From this data we learned that 100% of the respondents were accepted Use of computer software has facilitated better communication with its beneficiaries and partners. Therefore, currently 100% of the software facilitates a better communication with its beneficiaries and partners.

Table 4.4: Frequency table for the computer software

V.No.2: Computer software.						
Descriptions	N	Scale	Frequency	Percent	Mean	Std. Deviation
The software in the agency is user-friendly and easy to use.	78	Neutral	14	17.94	3.78	0.832
		Agree	29	37.18		
		Strongly Agree	35	44.88		
		total	78	100		
Use of computer software has facilitated better and quality service delivery to EFDARA customers.	78	Neutral	37	47.43	3.23	0.424
		Agree	41	52.57		
		total	78	100		
Use of Software application ensures reducing time complete the work and the exchange of information.	78	Neutral	24	30.76	3.53	0.734
		Agree	41	52.56		
		Strongly Agree	15	19.23		
		total	78	100		
Use of computer software has facilitated better communication with its beneficiaries and partners.	78	Agree	54	69.24	3.94	0.744
		Strongly Agree	24	30.76		
		total	78	100		
				mean of mean	3.62	

(Source:Survey result, 2021)

V.No.3: Telecommunication Infrastructure

On the availability of telecommunication infrastructure of the EFDARA is represented with fourquestions in this study. Therefore, the presentation of data via frequency statistical analysis isindicated below in the table 4.5. On the adequacy of telecommunication infrastructure is installation in the agency, from 78 collected responses 1 (1.28%) was disagree, 30(38.46%) were Neutral and 29 (37.18%) were Agree and 18 (23.07%)was Strongly Agree. From this data we learned that 60.25% of the respondents were accepted for the adequacy of the infrastructure, whereas 39.75% of the respondents were disagree or notaccepting fully for the adequacy of the telecommunication infrastructure. Therefore, currently 60.25% of the telecommunication infrastructure is available in the agency.

Related with reliable internet connection in the Agency, from 78 collected responses 29 (37.17%) were Agree and 49 (62.83%) were Strongly Agree. From this data we learned that 100% of the respondents were accepted agree for the availability of reliable internet connection in the agency. Therefore, currently 100% (Agree) of the reliable internet connection in the Agencyfairly exists.

Related with The use of telecommunication infrastructure has led to more formalization of communication and procedures, from 78 collected responses 29 (37.17%) were Agree and 49 (62.83%) were Strongly Agree. From this data welearned that 100% of the respondents were accepting telecommunication infrastructure has led to more formalization of communication and procedures in the agency. Therefore, currently 100% (Agree) of formal communication and procedure is significantly understandable.

Table 4.5: Frequency table for the TelecommunicationInfrastructure

V.No.3: Telecommunication Infrastructure						
Descriptions	**N**	**Scale**	**Frequency**	**Percent**	**Mean**	**Std. Deviation**
There is an adequate telecommunication infrastructure is installed in the agency.	78	Disagree	1	1.28	4.26	0.439
		Neutral	30	38.46		
		Agree	29	37.18		
		Strongly Agree	18	23.07		
		total	78	100		
There is a reliable internet connection in your Agency.	78	Agree	29	37.17	3.08	0.268
		Strongly Agree	49	62.83		
		total	78	100		
The use of telecommunication infrastructure has led to more formalization of communication and procedures.	78	Agree	29	37.17	4.26	0.439
		Strongly Agree	49	62.83		
		total	78	100		
mean of mean					3.86	

(Source: Survey result, 2021)

V.No.4: Databases and data warehouses.

The other independent variable is databases and data warehouses and it is representedwith three questions in this study and expressed based on the frequency statistical analysis as indicatedbelow in table 4.6. Databases of the agency are flexible, that helps in constantly updated and monitors a confidential data in accordance to the requirements of the global technology, from 78 collected responses 22(28.20%) were Neutral, 30(38.46%) were Agree and 26(33.33) were Strongly Agree. From this data we learned that 71.79% of therespondents were accepting the flexibility of the database and helps constantly updated and monitors a confidential data in accordance to the requirements of the global technology, whereas the remaining 28.20% of the respondents were replying that as they did not observe the flexibility of the database in the Agency. Therefore, currentlyonly 71.79% of the agreed on the databases of the agency are flexible.

Related with The databases of the agency help collect, analyze, store and retrieve data and information easily as needed, from 78 collected responses 26(33.33%) were Agree and 52 (66.67%) were Strongly Agree. From this data we learned that 100% of the respondents were accepting the databases help collect, analyze, store and retrieve data and information easily as needed in the agency. Therefore, currently 100% (agree) of the databases of the agency help collect, analyze, store and retrieve data and information easily as needed.

Related with Databases of the agency are characterized, being a safe to ensure the flow of accurate information betweendepartments and decision-makers, from 78 collected responses 23(29.48%) were Agree and 55 (70.52%) were Strongly Agree. From this data we learned that 100% of the respondents were accepting the databases safe to ensure the flow of accurate information betweendepartments and decision-makers in the agency.

Table 4.6:Frequency table for the Database and Data Warehousing

V.No.4: Database and Data Warehousing						
Descriptions	**N**	**Scale**	**Frequency**	**Percent**	**Mean**	**Std. Deviation**
Databases of the agency are flexible, that helps in constantly updated and monitors a confidential data in accordance to the requirements of the global technology.	78	Neutral	22	28.2	4.72	0.453
		Agree	30	38.46		
		Strongly Agree	26	33.33		
		total	78	100		
The databases of the agency help collect, analyze, store and retrieve data and information easily as needed.	78	Agree	26	33.33	4.77	0.424
		Strongly Agree	52	66.67		

		total	78	100		
Databases of the agency are characterized, being a safe to ensure the flow of accurate information between departments and decision-makers.	78	Agree	23	29.48	4.04	0.746
		Strongly Agree	55	70.52		
		total	78	100		
				mean of mean	4.51	

(Source: Survey result, 2021)

V.No.5: **Information system operating procedure**

The availability of the information system operating procedure is represented by threequestions. Hence, the presentation of data via frequency statistical analysis is as indicated below in table 4.7. In relation with When an employee hired in the agency, get orientations about how to work with systems and technological equipment and serve customers,from 78 collected responses 58 (74.35%) were Agree and 20 (25.64%) were Strongly Agree. Fromthis data we learned that 100% of the respondents were accepted the availability of orientation on how to work with the system and technological equipment and serve customers when new employees are hired in the agency. Therefore, currently 100% (Agree) of the When an employee hired in the agency, get orientations about how to work with systems and technological equipment and serve customers.

Related with the training and skills that your staff has on information system is adequate to deliver effective service to the clients, from 78 collected responses 72 (92.30%) were Neutral and 6(7.70%) were Agree. From this data we learned that 92.30% of the respondents were rejected or not fully agree for the availability of training and skills that the staff has on information system is adequate to deliver effective service to the clients. Therefore, currently 6(7.70%) of the existing agreed on the adequacy of training and skills that the staff has on information system is enough whereas 92.9%, which indicates there are significant shortage of training and skills that the staff has on information system in the agency.

Aligned with the Useof Information system has helped EFDARA improve employee's productivity and increased flexibility, from 78 collected responses 20 (25.64%) were Agree and 58 (74.36%) were Strongly Agree. From this data we learned that 100% of the respondents were accepted information system helped employee's productivity and increase flexibility in the agency.Therefore, currently 100% (agree) of the useof information system has helped EFDARA improve employee's productivity and increased flexibility.

Table 4.7:Frequency table for the Information system operating procedure

V.No.5: Information system operating procedure						
Descriptions	**N**	**Scale**	**Frequency**	**Percent**	**Mean**	**Std. Deviation**
When you are hired in the organization, you get orientations about how to work with systems and technological equipment and serve customers.	78	Agree	58	74.35	4.26	0.439
		Strongly Agree	20	25.64		
		total	78	100		
The training and skills that your staff has on information system is adequate to deliver effective service to the clients.	78	Neutral	72	92.3	3.08	0.268
		Agree	6	7.7		
		total	78	100		
Useof Information system has helped EFDARA improve employee's productivity and increased flexibility.	78	Agree	20	25.64	4.26	0.439
		Strongly Agree	58	74.36		
		total	78	100		
				mean of mean	3.86	

(Source: Survey result, 2021)

V.No.6: **Information system competence of the human resource.**

The last independent variable called Information system competence of the human resource is represented with three questions in this study and expressed based on the frequency statistical analysis as indicated below in table 4.8. Every agency's employee has a good understanding on using information systems and its components., from 78 collected responses 7 (8.97%) were Neutral, 30(38.46%) were Agree and 41(52.56%) were Strongly Agree. From this data we learned that 91.01% of the respondents were accepting every agency's employee has a good understanding on using information systems and its components, whereas the remaining 8.97% of the respondents were replying that as they did not observe the understanding of the employees on the information system in the agency as required. Therefore, currentlyonly 91.01% of the existing available employee have a good understanding on information system in the agency.

Related with when new systems or technological innovations introduced in the agency, the agency provides training for employees to fit with the new system, from 78 collected responses 33(42.30%) were Agree and 45 (57.70%) were Strongly Agree. From this data we learned that 100% of the respondents were accepting the availability of training for employees to fit with the new system while new systems or technological innovation is introduced. Therefore, currently 100% (agree) of the existing available training for employees to fit with the new systems while the new technologies or systems in the agency introduced are utilized significantly.

In response to Your agency encourages training and development among the staff relating on information system as a means of enhancing their skills, from 78 collected responses 35(44.88%) was Neutral, 20 (25.64%) were Agree and 23(29.48%)were Strongly Agree. From this data we learned that 55.12% of the respondents were accepting for the agency encourages training and development among the staff relating on information system. Therefore, currently 55.12% (agree) on the agency encourages training and development among the staff relating on information system are significantlyor fairly. Whereas 44.88%, which indicates there are significant shortage on encourages training and development among the staff relating on information system as a means of enhancing their skills.

Table 4.8:Frequency table for the Information system competence of the human resource

V.No.6: Information system competence of the human resource						
Descriptions	N	Scale	Frequency	Percent	Mean	Std. Deviation
Every agency's employee has a good understanding on using information systems and its components.	78	Neutral	7	8.97	4.44	0.656
		Agree	30	38.46		
		Strongly Agree	41	52.56		
		total	78	100		
When new systems or technological innovations introduced in your organization, the organization provides training for employees to fit with the new system.	78	Agree	33	42.3	4.58	0.497
		Strongly Agree	45	57.7		
		total	78	100		
Your agency encourages training and development among the staff relating on information system as a means of enhancing their skills.	78	Neutral	35	44.88	3.85	0.854
		Agree	20	25.64		
		Strongly Agree	23	29.48		
		total	78	100		
				mean of mean	4.29	

(Source: Survey result, 2021)

4.5. Analysis for the Dependent Variable

a) Dependent Variable Analysis Based on Frequency and Percent

Based on the frame work designed from IS theories and concepts in the literature review,Service delivery is considered as the dependent variable for this study. Accordingly table4.9 expressed the dependent variable service delivery based on better speed and quality, better management of services offered efficiency and effectiveness of the agency's service delivery and improve the services delivery through the information system.in Ethiopian Federal Document Authentication and Registration Agency using frequency and percentage as indicated below.

The uses of Information systems can provide public service delivery in a better speed and quality of services to customers.

From a total of 78 respondents who replied for the Information systems can provide public service delivery in a better speed and quality of services to customers in EFDARA, 6(7.69%), 54(69.23%) and 18(23.08%) of the responses were Neutral, Agree and Strongly Agreerespectively. Hence 92.31% of the managers and employees were accepting the uses of Information systems can provide public service delivery in a better speed and quality of services to customers in EFDARA by responding as agree and strongly agree. The analyzed dataconfirms that Information system provides a better speed and quality of service in the Agency is significant at 92.31%. The fact that theexistence of Information system at 92.31% which is significant in EFDARA may be as a result ofeither there was adequacy of the computer hardware, a better installation of telecommunication infrastructure and better management of the database, a user friendly and ease of system software and the human resource competence in their jobs. In addition to this,7.69% (6) of the staffs were replying Neutral (which is in between disagreeand agree) to proof the uses of Information systems can provide public service delivery in a better speed and qualityof services to customers. This might be as a result ofsuch respondents or managers were either do not have enough knowledge about the uses of information systemin the agency or involving less in the uses of information system.

Use of information system has facilitated better management of EFDARA services offered to its customers.

To conform the Use of information system has facilitated better management of EFDARA services offered to its customers, a total of 78 staffs were took as a sample. Out of which 29.49% (23) and 70.51% (55) of the respondents were replied as Neutral and Agree respectively. Accordingly the analyzed data in the given table shows Use of information system has facilitated better management of EFDARA services offered to its customers is significant at 70.51%. However, 29.49% (23) of the respondents were replying Neutral which means that these respondents are not exactly accepted the Use of information system has facilitated better management of EFDARA services offered to its customers since they are in between agree and disagree.

The current telecommunication infrastructure increases the efficiency and effectiveness of the agency's service delivery.

To test the current telecommunication infrastructure the efficiency and effectiveness of the agency's service delivery through the statistictool called frequency analysis, a total of 78 respondents were selected from the samplesize. Out of which 56(71.79%) and 22(28.20) of the respondents were responded as Agree andStrongly Agree respectively. As a result, all the respondents in EFDARA were accepting significantly at 100%(Agree) the telecommunication infrastructure increases the efficiency and effectiveness of the agency's service delivery. Therefore, telecommunication infrastructure in EFDARA is relevant currently at a higher rate of percentage orsignificant.

The Agency work to continuously improve the services delivery through the information system.

To attest the Agency work to continuously improve the services delivery through the information system, a total of 78 respondents, 12 (15.38%) and 66 (84.61%) of the respondents were replied as Agree and Strongly Agree respectively. So the agency works to continuously improve the services delivery through the information system in EFDARA at a higher rate of percentage at100 %. This implies that currently the agency is striving to improve the service delivery through the uses information system' is complete significantly.

Table 4.9: Frequency and percent table for the dependent variable (service delivery)

Frequency and percent table for the dependent variable (service delivery)				
Descriptions	N	Scale	Frequency	Percent
The uses of Information systems can provide public service delivery in a better speed and qualityof services to customers.	78	Neutral	6	7.69
		Agree	54	69.23
		Strongly Agree	18	23.08
		total	78	100
Use of information system has facilitated better management of EFDARA services offered to its customers.	78	Neutral	23	29.49
		Agree	55	70.51
		total	78	100
The current telecommunication infrastructure increases the efficiency and effectiveness of the agency's service delivery.	78	Agree	56	71.79
		Strongly Agree	27	28.2
		total	78	100
The Agency work to continuously improve the services delivery through the information system.	78	Agree	12	15.38
		Strongly Agree	66	84.62
		total	78	100

(Source Survey result, 2021)

b) Dependent Variable Analysis Based on Mean, Std. Deviation, Variance and Minimum and Maximum Values

The dependent variable "service delivery" is also analysed and presented via Minimum and Maximum values, Mean, Std. Deviation and Variance as indicated in table 4.10 below. Variance measures the variability or volatility from an average or mean. It measures how far a set of random numbers are spread out from their average value. The variance of a data set cannot be negative or is always positive because it is the sum of the squared deviation divided by a positive value. When the distributions of data with a coefficient of variation higher than 1 are considered as a high variance whereas those with a coefficient of variation lower than 1 are considered as a low variance. When the variance of a random variable is zero, then that random variable must be a constant. Zero variance means all observations are equal. Standard deviation is a number used to tell how measurements for a group are spread out from the average mean, or expected value. A low standard deviation means that most of the numbers are very close to the average. A standard deviation close to zero indicates that the data points tend to be very close to the mean (expected value) of the set, while a high standard deviation indicates that the data points are spread out over a wider range of values. Standard deviation cannot be negative because it is square rooted variance. Mean is equal to the sum of all the values in the data set divided by the number of values in the data set (Ronald, 2002).

The effect of information system is critically linked with the effectiveness of service delivery. For the effective and efficient to be valuable, organization have to be developing MIS (a system that generates accurate, relevant, complete and reliable information and delivers timely) that really supports the management decision. Hence, decision has to be made effective when it is timely, accurately, reliably, completely and relevantly presented for the decision maker. Using the above five components as criteria that expresses effective managerial decisions, the following five questions were developed and forwarded to the respondents selected from the sample size based on the five point Likert scale model with 1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly Agree. Table 4.5 illustrates each of the five questions based on Minimum and Maximum values, Mean, Std. deviation and Variance existed between variables as indicated below.

Table 4.10: Mean, Std Deviation, Values Analysis for dependent variable (service delivery)

Descriptive Statistics			
	N	Mean	Std. Deviation
The uses of Information systems can provide public service delivery in a better speed and quality of services to customers.	78	4.15	0.536
Use of information system has facilitated better management of EFDARA services offered to its customers.	78	3.71	0.459
The current telecommunication infrastructure increases the efficiency and effectiveness of the agency's service delivery.	78	4.35	0.479
The Agency work to continuously improve the services delivery through the information system.	78	4.82	0.419
mean of mean		4.257	

Source: (SPSS Output, 2021)

The uses of Information systems can provide public service delivery in a better speed and quality of services to customers.

Related to the better speed and quality of services to customers currently in EFDARA, respondents were replaying with minimum 3(Neutral) and maximum 5(strongly Agree). The Mean value (4.15) is fall in between Neutral (3) and Strongly Agree (5). This indicates that, the Mean value (4.15) is most probably approaches to the Agree (4) option, because it is far from the Neutral (3) with 92.31% and from Agree (4) only 29%. Further, the standard deviation (0.53**6**), this indicates that the majorities of the respondents were replied very close to the Average Mean (4.15), which is approximately Agree (4). Therefore, the uses of Information systems can provide public service delivery in a better speed and quality of services to customers in Ethiopian Federal Document Authentication and Registration Agency exist significantly at 92.31% (Agree) or better speed and quality of services to customers through Information system are good enough.

Use of information system has facilitated better management of EFDARA services offered to its customers.

Aligned with the existence of IS facilitated better management of services offered to its customers in EFDARA, respondents were replaying with minimum 3(Neutral) and maximum 4(Agree). The Mean value (3.71) is fall in between Neutral (3) and Agree (4). This implies that, the Mean value (3.71) is most probably approaches to the Agree (4) option, because it is far from the Neutral (3) with 70.1 % and from Agree (4) with 29.9%. Further, the standard

deviation (0.4**59**) **is** below 1 with a low standard deviation. This indicates that the majorities of the respondents were replied very close to the Average Mean (3.7), which is approximately Agree (4). Therefore, Use of information system has facilitated better management of EFDARA services offered to its customers exist significantly at 70.1% (Agree) or IS facilitated better management of services offered to its customers in EFDARA are fairly exist.

The current telecommunication infrastructure increases the efficiency and effectiveness of the agency's service delivery.

In the processes of proving the current telecommunication infrastructure in increasing efficiency and effectiveness of service delivery in EFDARA, respondents were replayed with minimum 4(Agree) and maximum 5(strongly Agree). The Mean value (4.**35**) is fall in between Agree (4) and Strongly Agree (5). This replies that the Mean value (4.**35**) is exactly above the Agree (4) option. Further, the standard deviation (0.4**79**) for this question is below 1 with a low standard deviation. The analysed data in the table demonstrates that all of the respondents were agreed and accepted that the current telecommunication infrastructure increases the efficiency and effectiveness of the agency's service delivery. Therefore, telecommunication infrastructure currently in EFDARA exist significantly at 100% (Agree) or relevant.

The Agency work to continuously improve the services delivery through the information system in EFDARA

Related to verifying The Agency work to continuously improve the services delivery through the information system, respondents were replaying with minimum 4(Agree) and maximum 5(Strongly Agree). The Mean value (4.8**2**) is fall in between Agree (4) and Strongly Agree (5). This implies that the Mean value (4.8**2**) is most probably approaches to the Strongly Agree (5) option, because it is far from the Agree (4) option with 84.62% and from the Strongly Agree (3) onl**y 15.38%. In addition to this,** the standard deviation (0.4**19**) andfor this question **is** below 1 with a low standard deviation and variance. Furthermore, the majorities of the respondents were replied very close to the Average Mean (4.8**2**) which is approximates the Strongly Agree (5). Therefore, the agency work to continuously improve the service delivery through the information system is exist significantly at 15.83% (Agree) and the rest 84.62 % was fall to strongly Agree.

4.6 Correlation between Dependent and Independent Variables

Correlation is a term that refers to the strength of a relationship between two variables. It is also a statistical device that measures the strength or degree of a supposed linear association between two or more variables. The strongest linear relationship is indicated by a correlation coefficient of -1 or 1. The weakest linear relationship is indicated by a correlation coefficient equal to 0. A positive correlation means that if one variable gets bigger, the other variable tends to get bigger. A negative correlation means that if one variable gets bigger, the other variable tends to get smaller. In statistics, a perfect positive correlation is represented by 1, while 0 indicates no correlation and negative 1 indicates a perfect negative correlation. Pearson correlation and Sig. (2-tailed) are commonly used measures of correlation that estimate relationship between two interval variables (https://www.google.com/search. Accessed April 21, 2019). Further, the coefficient of correlation relationship become Strong when value of r ranges from -1 to -0.5 or 0.5 to 1, become Moderate when value of r ranges from -0.4 to -0.3 or 0.3 to 0.4, become Weak when value of r ranges from - 0.2 to -0.1 or 0.1 to 0.2 and become None or Very weak when value of r ranges between < 0.1 to > - 0.1 (https://www.google.com/search, Accessed April 21, 2019).

In this section, correlation analysis conducted in the light of each research objectives and conceptual frame works developed. The relationship between independent variable (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources) and dependent variable (service delivery)was investigated using correlation analysis. This provided correlation Coefficients which indicated the strength and direction of relationship. The p-value also indicated the probability of this relationship's significance.

Table 4.11: Correlation Matrix between dependent variable, and independent variables

Correlations

		Service Delivery	Computer Hardware	Computer software	Telecommunication Infrastructure	Data base and Data warehousing	Information system operating procedure	Information system competence of the human resource
	Pearson Correlation	1	.521**	.576**	.715**	.731**	.778**	.865**
	Sig. (2-tailed)		0	0	0	0	0	0
Service Delivery	N	78	78	78	78	78	78	78
Computer Hardware	Pearson Correlation	.521**	1	-.225*	0.072	.791**	.742**	.703**

	Sig. (2-tailed)	0		0.048	0.533	0	0	0
	N	78	78	78	78	78	78	78
	Pearson Correlation	.576**	-.225*	1	.787**	0.113	.269*	.281*
	Sig. (2-tailed)	0	0.048		0	0.325	0.017	0.013
Computer software	N	78	78	78	78	78	78	78
	Pearson Correlation	.715**	0.072	.787**	1	.262*	.533**	.650**
	Sig. (2-tailed)	0	0.533	0		0.02	0	0
Telecommunication Infrastructure	N	78	78	78	78	78	78	78
	Pearson Correlation	.731**	.791**	0.113	.262*	1	.866**	.752**
	Sig. (2-tailed)	0	0	0.325	0.02		0	0
Data base	N	78	78	78	78	78	78	78
	Pearson Correlation	.778**	.742**	.269*	.533**	.866**	1	.867**
	Sig. (2-tailed)	0	0	0.017	0	0		0
Information system operating procedure	N	78	78	78	78	78	78	78
	Pearson Correlation	.865**	.703**	.281*	.650**	.752**	.867**	1
	Sig. (2-tailed)	0	0	0.013	0	0	0	
Information system competence of the human resource	N	78	78	78	78	78	78	78
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Source: (SPSS Output, 2021)

The correlation Matrix between independent variable (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources) and dependent variable (service delivery)was computed in the above table 4.11. The result of correlation matrix dependent variable (service delivery) against independent variable (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources) as follow.

As indicated on table 4.11, the Pearson correlation test was conducted between dependent variable against independent variables. And on the given study the results show that there is significant positive correlation at the level of 0.01 between a dependent variable (Effects of information system on service delivery) against independent variable (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources). In other words, computer

hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources has positive relationship with correlation coefficient of .521** (r=0.521), .576** (r=0.576), .715** (r=0.715), .731** (r=0.731),.778** (r=0.778),and .865** (r=0.865), respectively, and strongly significant significance at the value of 0.01 level with dependent variable (service delivery).

Furthermore, the research findings of the above empirical investigation on table 4.11 are generally consistent with majority of prior studies and stand with more recent studies reporting similar results. This consolidates the research findings and dimensions reaching relatively conclusive results on the topic of Effects of Information system on service delivery: in the case of Ethiopian Federal Documents Authentication and Registration Agency in Addis Ababa, Ethiopia. In addition, the new research discoveries and research directions attained with in the set of empirical observation bridge the mixed theoretical views of Effects of Information system on service deliverywithin the existing knowledge, giving rise to some good insights.

In general, the overall empirical findings of this research investigation from the statistical results of correlation matrix indicates that the correlation between independent variable (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources) and dependent variable (service delivery)have a positive impact and most largely and significantly associated.

4.7. Regression Analysis

This regression analysis is conducted to know by how much the independent variable (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources) explains the dependent variable (Effects of Information system on service delivery). The regression analysis was conducted based on the conceptual framework that is between dependent variable (Effects of Information system on service delivery) against independent variable (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources). The results of the regression analysis are presented as follows.

4.7.1 Autocorrelation Test

Table 4.12 shows that the multiple linear regression model summary and overall fit statistics. From the table its find that the adjusted R2 of the proposed model is 0.908with R2 = 0.915, this means that the linear regression explains 91.5 % of the variance in the data. The Durbin-Watson d = 1.64, which is between the two critical values of 1.5 < d < 2.5 (Bryman, A. and Bell, E., 2015). Therefore, in the multiple linear regression data that is used for this model there is no first order linear auto correlation.

Table 4.12: Autocorrelation Test

Model Summary[b]										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.957[a]	0.915	0.908	0.11531	0.915	127.567	6	71	0	1.64
a. Predictors: (Constant), Information system competence of the human resource, Computer software, Data base, Computer Hardware, Information system operating procedure, Telecommunication Infrastructure										
b. Dependent Variable: Service Delivery										

Source: (SPSS Output, 2021)

4.7.2 Multicollinearity Test

Table 4.13: Multicollinearity test of independent variable (Coefficients[a])

Coefficients[a]										
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	0.638	0.36		1.771	0.081	-0.08	1.356		
	Computer Hardware	0.034	0.04	0.07	0.867	0.389	-0.045	0.114	0.183	5.465
	Computer software	0.311	0.047	0.488	6.544	0	0.216	0.405	0.215	4.657
	Telecommunication Infrastructure	-0.08	0.117	-0.073	-0.685	0.496	-0.314	0.153	0.105	9.49
	Data base	0.273	0.068	0.364	4.001	0	0.137	0.41	0.144	6.926
	Information system operating procedure	-0.101	0.034	-0.3	-2.974	0.004	-0.168	-0.033	0.117	8.52
	Information system competence of the human resource	0.428	0.063	0.713	6.775	0	0.302	0.554	0.108	9.259
a. Dependent Variable: Service Delivery										

Source: (SPSS Output, 2021)

The result in table 4.13 show that the collinearity between independent variables has no series problem, hence the value of tolerance for all independent variable is greater than 0.1 and all

VIF is less than ten (VIF<10), according to (Pallant 2005). Thus, from the above table 4.13 it can be concluding that there is no co linearity within the data of the study.

4.7.3 Regression analysis between dependent variable, and independent variables

Table 4.14: Regression model between dependent variable, and independent variables

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.957[a]	0.915	0.908	0.11531
a. Predictors: (Constant), Information system competence of the human resource, Computer software, Data base, Computer Hardware, Information system operating procedure, Telecommunication Infrastructure				
b. Dependent Variable: Service Delivery				

Source: (SPSS Output, 2021)

Table 4.14 above indicates R, R Square, Adjusted R Square and standard error of the estimate. Further, it lists the independent variables that are entered in to the regression model. R (.957) is the correlation of independent and moderate variables with the dependent variable. The model summary, above shows the R Square value is 0.915. This tells us how much of the variance in the dependent variable (service delivery) are explained by the independent variables (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources). This means that the model independent variables(computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources) explains 91.5% of the variance in dependent variable (service delivery) under the case study, the remaining 8.5% of the changes in the fact can be attributed from other factors. To assess the statistical significance of the result it is necessary to look in to table 4.15 ANOVA.

Table 4.15: ANOVA result between dependent variable, and independent variables

ANOVA[a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.178	6	1.696	127.567	.000[b]
	Residual	0.944	71	0.013		
	Total	11.122	77			
a. Dependent Variable: Service Delivery						
b. Predictors: (Constant), Information system competence of the human resource, Computer software, Data base, Computer Hardware, Information system operating procedure, Telecommunication Infrastructure						

Source: (SPSS Output, 2021)

The F Value in the ANOVA test determine the p value; the P value is the probability of getting a result at least as extreme as the one that was actually observed, given that the null

hypothesis is true. The null hypothesis is rejected when the p value is smaller than the alpha level from the ANOVA test. Which means the null value is rejected if the critical F value is smaller than F value in the ANOVA tests, unless you also have a small P value. Hence, for this research the test P value of 0.00 from table 4.12 was computed which indicate the test P value is smaller than an alpha level of 0.05 and 0.01, which means the null hypothesis couldn't be rejected by comparing the F value in the ANOVA test.

In sum, the ANOVA Table 4-15 above shows that p - value (sig.) is significant at 0.01 level of significance. This indicates a statistically there is significant contribution, as indicated by the Sig. value equal to .000. Therefore, the ANOVA table indicates that the model as a whole is significant at $p<0.01$). The R^2 result indicates that 91.5% of the variance in service delivery (dependent variable) has been significantly explained by independent variables (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, operation procedure and competence of human resources). Accordingly, since the sign of 'B' coefficient for the independent variables is positive, therefore there is a positive relationship between the variables.

The F-ratio in the ANOVA table tests whether the overall regression model is a good fit for the data. The F value shows 127.567which is greater than the F critical it shows the model is significant. Which implies the coefficients included in the model improved the model fit.

Table 4.16: Regression coefficient between dependent variable, and independent variables

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.638	0.36		1.771	0.081
	Computer Hardware	0.034	0.04	0.07	0.867	0.389
	Computer software	0.311	0.047	0.488	6.544	0
	Telecommunication Infrastructure	-0.08	0.117	-0.073	-0.685	0.496
	Data base	0.273	0.068	0.364	4.001	0
	Information system operating procedure	-0.101	0.034	-0.3	-2.974	0.004
	Information system competence of the human resource	0.428	0.063	0.713	6.775	0

a. Dependent Variable: Service Delivery

b. Predictors: (Constant), Information system competence of the human resource, Computer software, Data base, Computer Hardware, Information system operating procedure, Telecommunication Infrastructure

Source: (SPSS Output, 2021)

In general, Table 4.16 shows the ANOVA results of the multiple regression analysis. The significance value of 0.00 indicates that the regression relationship is strongly significant in predicting dependent variable (Service delivery) against its factors explained as independent variables (computer software, database and data warehousing, operation procedure and competence of human resources) which shows the model is significant and fit to the regression model.

The regression model equation was:

$$Y = \alpha 0 + \beta 2X2 + \beta 4X4 + \beta 4X5 + \beta 4X6 + \varepsilon$$

Where:

Y = Effects of information system on Service Delivery

α_0 = Constant

β = Determines the relationship between the independent variable X and the dependent or Gradient/Slope of the regression measuring the amount of the change in Y associated with a unit change in X.

X1 = Computer Hardware

X2 = Computer Software

X3 = Telecommunication Infrastructure

X4 = Database and Data Warehousing

X5 = Information system operation procedure

X6 = Information system competence of human resources

ε = The Error term which accounts for other unobserved factors that may have an effect on local economy

As per the result above the resulting equation become:

$$Y = 0.638 + 0.488X_2 + 0.364X_4 + (-0.3X_5) + 0.713X_6 + \varepsilon(0.05)$$

The result of this study exhibited that the independent variables (computer software, database and data warehousing, operation procedure and competence of human resources) have positive and significant effect on dependent variable (Service delivery) in the studied selected case area. As the result indicate and standardized coefficient of Beta=0.488 (at a tolerance level of 6.544 and sig. at the 0.05 level) for service delivery on computer software,standardized coefficient of Beta=0.364 (at a tolerance level of 4.001 and sig. at the 0.05 level) for database and data warehousing, standardized coefficient of Beta=(-0.3) (at a

tolerance level of -2.974 and sig. at the 0.05 level) for information system operation procedure, and standardized coefficient of Beta=0.713 (at a tolerance level of 6.775 and sig. at the 0.05 level) for information system competence of human resource, which these results implied that from the regression analysis; its results that all the independent variables (computer software, database and data warehousing, operation procedure and competence of human resources)have positive and significant effect on dependent variable (Effects of information system on Service delivery) in the studied selected case area.

Whereasthe independent variables (computer hardware and telecommunication infrastructure) have no significant effect on dependent variable (Service delivery) in the studied selected case area.As the result indicate and standardized coefficient of Beta=0.07 (at a tolerance level of 0.867 and sig. at the 0.05 level) for service delivery on computer hardware, and standardized coefficient of Beta=- 0.073(at a tolerance level of 0.685 and sig. at the 0.05 level) for telecommunication infrastructure.

Table 4.17: Hypothesis test summery

INDEPENDENT VARIABLES	**standardized coefficient**		**hypothesis result**
	Beta	**p-value**	
Computer Hardware	0.07	0.389	rejected
Computer software	0.488	0.000	accepted
Telecommunication Infrastructure	0.073	0.496	rejected
Database and Data Warehousing	0.364	0.000	accepted
Information system operating procedure	(-0.3)	0.004	accepted
Information system competence of the human resource	0.713	0.000	accepted

Source: (SPSS Output, 2021)

4.8. Results of Observation

The second technique was personal observation of selected branches of the agency in order to measure the speed of service delivery, the uses of information technologies and convenience of the waiting places. An observation check list was prepared and the researcher measured how information system is implemented and its effect on service delivery, and the adequacy of computer hardware and telecommunication infrastructure installation, busy agency offices for three consecutive days, for half an hour in each branch, and found the following:

The services provided were carried out in the agency and there is adequate computer hardware for employees and the telecommunication infrastructure is also in a good situation. The employees are using an online information system or web based system software to deliver servicesthat will enable applicants to register and request authentication of documents online without stepping into the doors of the agency. All windows were functional and customers were served at any of the windows. At all the branches of the agency "Queue machine" was installed and customers were served on a first come first served basis.
When the data were combined for the agency, the results indicated that there is a significantassociation between IS and service delivery success and employees satisfaction.

4.9. Summary of the Results

In general, from the earlier discussion on the aspects of IS from the employees and managers perspectives, results have indicated that there are observable and tangible positive improvements in the agency' service delivery due to IS implementation. It has been indicated that IS implementation brought about quality and speedy in service delivery, better management of information communication with its partners, cycle time reduction as well as customer satisfaction improvement significantly as a result of these the agency is striving to improve the service delivery through information systems.

As witnessed by managers and employees, an adequacy of computer hardware with a better specification; better installed communication infrastructure with a high speed internet connection; better management of database which is easily accessible; ease to access and a user friendly system software; and by training employees for the new system; the agency gets a better service delivery improvements.

Much previous research thathas been conducted reported the same finding. Chen and Tsou (2012) found that the interaction between thecapabilities of information system and human resources can influence the ability of IS to effectively improveService delivery.Omare (2015) reported that more research and investigation on banks in Iraq should bedone, especially with regards the use of IS components. The findings of the current study also prove that IS helpedimprove the effectiveness of service delivery of the agency through the uses of IS.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5. Introduction

Chapter five is enclosed summary of the research findings, conclusions and recommendations for the whole study and suggestion for further study. The summary of the research finding and the conclusion parts of this study are presented in section 5.1 and 5.2 respectively. Whereas the possible recommendations and suggestion for further research are also presented in section 5.3 and 5.4, respectively.

5.1. Summary of major research Findings

According to the data analysis in the previous section, summary of the findings presented as follows.

The study determined the influence of two (2) collective building blocks of effect of computer hardware on service delivery, and both the items for the adequacy of computer hardwareand its specification for performing tasks that affects service delivery growth scores a total mean of mean of 3.9, which implied that the respondents agreed to the fact that there is adequate computers with a better specification to perform their tasks in a better quality and speedy. But for the study the computer hardware has no a significance effect on service delivery.

The study further evaluating the extent to which the four (4) collective building blocks of computer software on service delivery, and all of the items for the computer software that affects the service deliveryscores a total mean of mean of 3.62, which implied that the respondents agreed to the fact that effect of computer software on service delivery is at the level of great extentthrough reducing time complete the work and facilitating a better communication with its partners and barriers through the developed three different easily accessible and user friendly software.

The study also assessed the influence of three (3) collective building blocks of effect of telecommunication infrastructure on service delivery, and all of the items for the effect of telecommunication infrastructure that effectson service delivery scores a total mean of mean of 3.86, which implied that the respondents agreed to the fact that effect of telecommunication infrastructureon service delivery is at the level of great extent, and found that it facilitate or led the agency to more formalization of communication and

procedures with the help of adequate telecommunication infrastructure and with better internet access .

The study in addition explored to what extent that three (3) collective building blocks of effect of database and data warehousing on service delivery of the agency, and all of the items for the effect of database and data warehousing of the agency that affects service delivery scores a total mean of mean of 4.51, which implied that the respondents agreed to the fact that effect of database and data warehousing on service delivery is at the level of great extent, and found that there is a better data management or flexible that will help the in constantly update and monitor a confidential data, the database help to manage the data easily and being a safe to ensure the flow of accurate information between department and decision makers.But for the study the telecommunication infrastructure has no a significance effect on service delivery.

The study also evaluates the extent that three (3) collective building blocks of effects of information system operating procedure on service delivery, and all of the items for the effects of information system operating procedure scores a total mean of mean of 3.86, which implied that the respondents agreed to the fact that effects of information system operating procedure on service delivery is at the level of great extent, and found that when there are new things are added to any of the system or new information technological equipmentsand system presents the agency prepare training and skills for the employees to have a better understanding on it.

The study in addition explored to what extent that three (3) collective building blocks of effect of information system competence of human resource on service delivery of the agency, and all of the items for the effectinformation system competence of human resource affects service delivery scores a total mean of mean of 4.29, which implied that the respondents agreed to the fact that the effectinformation system competence of human resourceon service delivery is at the level of great extent, and found that there is a better training and development among the staffs relating with information systems and every agency's employees have a good understanding on using information systems.

Finally, the statistical results of study from the correlation andregression analysis confirm and explore that there is a strongly significant positive correlation at the level of 0.05 between independent variables (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, information system

competence on human resource, information system operating procedure) with the dependent variable (service delivery). The regression was conducted based on the conceptual framework that is between dependent variable (service delivery) and implied that all independent variables for the study have a positive impact and most largely and significantly associated with dependent variable. Regression analysis in addition revealed that that nearly 91.5% of the variance in the data for the study which showed that of dependent variable (service delivery) is explained by independent variables (computer hardware, computer software, telecommunication infrastructure, database and data warehousing, information system competence on human resource, information system operating procedure).

5.2. Conclusion

Nowadays, Information System (IS) is widely used in organizations to improve their performance and augment customersatisfaction. This study was aimed at analyzing the effects of Information System on service delivery: a case study of Ethiopian federal documents authentication and registration agency in Addis Ababa. The data were generated from primary sources.The data were collected from the selected three branch managers, employees andIT team members, using questionnaire and direct observation.In finding the reliable effects of Information System on service delivery it was tried to effectively assess all important and related issues and the findings of this study are summarized as follows.

Analysis of the effects of Information System on service delivery in thestudy area revealed that service delivery success of usingIS in Ethiopian federal documents authentication andregistration agency in Addis Ababa was successful. Results indicated that the use of IS was relevant in improving service delivery.

The observation result depicted also that the new paradigm shift as a result of IS helped theagency to deliver good quality services and to satisfy customers. There is significant telecommunication Infrastructure is installed in the branches of the agency, this will help the organization to have a formal communication with its partners like banks, tenure administrations and transport offices, without stepping to the doors of the agency. And there were adequate desktop computer hardware, each and every organization employees has desktop computer to perform its tasks.

The findings of the study indicates that, IS has effect not only on the service delivery but also on all dimension of managers, employs and customers attitude, and other that in turn contributes towards country development.Much previous research thathas been conducted

reported the same finding. Chen and Tsou (2012) found that there the interaction between thecapabilities of information technology and human resources can influence the ability of IS to effectively improve service delivery. The findings of the current study also prove that IS and its components help to improve the service delivery.

5.3. Recommendations

In the light of findings enumerated above, the following recommendations were made towards using the information system to service delivery in EFDARA.

1. Proper orientation should be given to managers at all levels as well as in-service training for employees to ensure proper and adequate use of IS facilities in generating and disseminating information for better services in the Agency.
2. Because of widely varying understanding about vulnerabilities, threats, and safeguards, system vendors and users need guidance to develop and use trusted systems. So that the agency should work more on the system security issues. Otherwise, security problems will be come and affect the functionality of the system.

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Appendices

Appendix-A:			
	N	Mean	Std. Deviation
Computer Hardware			
There is enough and adequate computer hardware that can serve the whole agency employees in the branch.	78	3.97	0.755
Computer hardware's specification is enough to perform all the tasks.	78	3.83	0.828
mean of mean		3.9	
Computer Software			
The software in the agency is user-friendly and easy to use.	78	3.78	0.832
Use of computer software has facilitated better and quality service delivery to EFDARA customers.	78	3.23	0.424
Use of Software application ensures reducing time complete the work and the exchange of information.	78	3.53	0.734
Use of computer software has facilitated better communication with its beneficiaries and partners.	78	3.94	0.744
mean of mean		3.62	
Telecommunication Infrastructure	**N**	**Mean**	**Std. Deviation**
There is an adequate telecommunication infrastructure is installed in the agency.	78	4.26	0.439
There is a reliable internet connection in your Agency.	78	3.08	0.268
The use of telecommunication infrastructure has led to more formalization of communication and procedures.	78	4.26	0.439
mean of mean		3.86	
Database and Data Warehousing	**N**	**Mean**	**Std. Deviation**
Databases of the agency are flexible, that helps in constantly updated and monitors a confidential data in accordance to the requirements of the global technology.	78	4.72	0.453
The databases of the agency help collect, analyze, store and retrieve data and information easily as needed.	78	4.77	0.424
Databases of the agency are characterized, being a safe to ensure the flow of accurate information between departments and decision-makers.	78	4.04	0.746
mean of mean		4.51	

Information system operating procedure	**N**	**Mean**	**Std. Deviation**
When you are hired in the organization, you get orientations about how to work with systems and technological equipment and serve customers.	78	4.26	0.439
The training and skills that your staff has on information system is adequate to deliver effective service to the clients.	78	3.08	0.268
Use of Information system has helped EFDARA improve employee's productivity and increased flexibility.	78	4.26	0.439
mean of mean		3.86	
Information system competence of the human resource	**N**	**Mean**	**Std. Deviation**
Every agency's employee has a good understanding on using information systems and its components.	78	4.44	0.656
When new systems or technological innovations introduced in your organization, the organization provides training for employees to fit with the new system.	78	4.58	0.497
Your agency encourages training and development among the staff relating on information system as a means of enhancing their skills.	78	3.85	0.854
mean of mean		4.29	

Appendix-B:

	N	Mean	Std. Deviation
The uses of Information systems can provide public service delivery in a better speed and quality of services to customers.	78	4.15	0.536
Use of information system has facilitated better management of EFDARA services offered to its customers.	78	3.71	0.459
The current telecommunication infrastructure increases the efficiency and effectiveness of the agency's service delivery.	78	4.35	0.479
The Agency work to continuously improve the services delivery through the information system.	78	4.82	0.419
mean of mean		4.257	

Appendix-C:
Questionnaire

Dear Respondent

The question which is accessible for you is in direction of a student research. The purpose of this research is to investigate the effects of Information system on service delivery in Ethiopian federal document authentication and registration agency.Please help me for performing this research by answering to the following questions. Incidentally, please write your opinion at the back of this questionnaire. I am so thankful because of your attention and patience for completing this questionnaire.

Instructions: Please respond to the following questions and where applicable, mark the relevant box with a tick (√).

Confidentiality: The responses you provide will be strictly confidential. No reference will be made to any individual(s) in the report of the study.

Part A: General Information:

1. Your gender

[ ] Male

[ ] Female

2. Your age

[ ] Below 20 years

[ ] 21-30 years

[ ] 31-40 years

[ ] 41-50 years

[ ] above 50 years

3. Indicate your highest level of qualification.

[ ] Secondary education

[ ] Certificate/diploma

[ ] Bachelor /degree

[ ] Masters

[ ] Doctorate

4. Your designation

[ ] Director

[ ] Senior management

[ ] Middle management

[ ] Subordinate

5. How many years have you worked for Federal Document Authentication and Registration Agency?

[ ] Less than 5 Years

[ ] 5-10 Years

[ ] 11-15 Years

[ ] 16-20 Years

[ ] 20 Years and above

Part B: Use and impact of Information System

1. What IT device(s) do you have at your disposal to enable you perform your duty?

a) Mobile phone [ ] b) Desktop Computer [ ] c) Laptop [ ]

d) IPad or Tablet [ ] e) other [ ] Please specify _____

2. Kindly indicate the extent of use of the following systems/devices at EFDARA (tick where appropriate).

Direction: Please rate the statements below designed to measure the level of agreement or disagreement in relation to Service Quality Dimension. Select an option by encircling the appropriate number against each question. Where: 1- Strongly Disagree(SDA); 2-Disagree (D); 3- Neutral (N); 4-Agree(A); 5-Strongly Agree (SA)

`	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
	1	**2**	**3**	**4**	**5**
Computer hardware					
There is enough and adequate computer hardware that can serve the whole agency employees in the branch.	1	2	3	4	5
Computer hardware's specification is enough to perform all the tasks.	1	2	3	4	5
Computer software					
The software in the agencyis user-friendly and easy to use.	1	2	3	4	5
Use of computer software has facilitated better and quality service delivery to EFDARA customers.	1	2	3	4	5
Use of Software application ensures reducing time complete the work and the exchange of information.	1	2	3	4	5
Use of computer software has facilitated better communication with its beneficiaries and partners.	1	2	3	4	5
Telecommunication infrastructure					
There is an adequate telecommunication infrastructure is installed in the agency.	1	2	3	4	5
There is a reliable internet connection in your Agency.	1	2	3	4	5

The use of telecommunication infrastructure has led to more formalization of communication and procedures.	1	2	3	4	5
Databases and data warehouses					
Databases of the agency are flexible, that helps in constantly updated and monitors a confidential datain accordance to the requirements of theglobal technology.	1	2	3	4	5
The databases of the agency help collect, analyze, store and retrieve data and information easily as needed.	1	2	3	4	5
Databases of the agency are characterized, being a safe to ensure the flow of accurate information betweendepartments and decision-makers.	1	2	3	4	5
Information system operating procedure					
When you are hired in the organization, you get orientations about how to work with systems and technological equipment and serve customers.	1	2	3	4	5
The training and skills that your staff has on information system is adequate to deliver effective service to the clients.	1	2	3	4	5
Useof Information system has helped EFDARA improve employee's productivity and increased flexibility.	1	2	3	4	5
Information system competence of the human resource					
Every agency's employee has a good understanding on using information systems and its components.	1	2	3	4	5
When new systems or technological innovations introduced in your organization, the organization provides training for employees to fit with the new system.	1	2	3	4	5
Your agency encourages training and development among the staff relating on information system as a means of enhancing their skills.	1	2	3	4	5
Service delivery					
The uses of Information systems can provide public service delivery in a better speed and qualityof services to customers.	1	2	3	4	5
Use of information system has facilitated better management of EFDARA services offered to its customers.	1	2	3	4	5
The current telecommunication infrastructure increases the efficiency and effectiveness of the agency's service delivery.	1	2	3	4	5
The Agency work to continuously improve the services delivery through the information system.	1	2	3	4	5

4. Please give suggestions/recommendations on how else the use of information technology has made service delivery better.

_____
_____
_____.

THANK YOU FOR YOUR TIME AND COOPERATION

Appendix-D:

St. Mary University

Observation Check list

Name of the research: The effects of Information system on service delivery

Date _____

No	Criterion	yes	No
1	Do they have adequate computer hardware exist for employees		
2	Do the computer hardware specification is significant for working		
3	Is system software properly implemented and utilized by the employees of the organization		
4	Do they have adequate telecommunication infrastructure installed in the agency		
5	Are the employees capable or compete to use the information system tools		
6	Do the system software helps the agency to perform its task in a better way.		
7	Is there a better internet connection in the agency		
8	Do customers get a better service from the agency		