ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTMENT OF MARKETING MANAGEMENT

ASSESSMENT OF THE QUALITY OF E-GOVERNMENT SERVICES AND ITS ROLE IN ACHIEVING CUSTOMER SATISFACTION: THE CASE OF i-REGISTER IN ETHIOPIAN FOOD AND DRUG AUTHORITY

BY

GUTU TEREFE

A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, SCHOOL OF COMMERCE FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR MASTERS OF MARKETING MANAGEMENT (MA)

SEPTEMBER, 2022

ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

ASSESSMENT OF THE QUALITY OF E-GOVERNMENT SERVICES AND ITS ROLE IN ACHIEVING CUSTOMER SATISFACTION: THE CASE OF i-REGISTER IN ETHIOPIAN FOOD AND DRUG AUTHORITY

BY

GUTU TEREFE

APPROVED BY BOARD OF EXAMINERS

_____	_____
Dean, School of Commerce	**Signature**
_____	_____
Advisor	**Signature**
_____	_____
External Examiner	**Signature**
_____	_____
Internal Examiner	**Signature**

DECLARATION

I hereby declare that this study on "Assessment of the quality of e-government services and its role in achieving customer satisfaction: the case of i-register in Ethiopian Food and Drug Authority." is my original work, that it has not been submitted for a degree at any other University, and that all sources used for the study have been properly cited.

Name	**Signature**	**Date**

Table of Contents

List of tables

List of Figures

List of Abbreviations

ICT: Information and Communication Technology

EFDA: Ethiopian Food and Drug Authority

eRIS: electronic regulatory information system

Acknowledgments

My heartfelt thanks and appreciation goes to my advisor Mesfin Workneh (PhD) for his patience, unwavering professional assistance and insightful comments until the end of this study completion.

My heartfelt gratitude also goes to the respondents and data collectors who voluntarily participated in the study to fill out questionnaires and collect data respectively.

Last but not least, I would like to express my gratitude to everyone who assisted me in carrying out this research.

Abstract

E-government services have drawn interest from all around the world because they enable a government to carry out its duties in an effective and efficient manner, changing the way it interacts with its customers, enterprises, or other governmental branches. There are strong relationships between service quality and customer satisfaction. In recent years, the Ethiopian Food and Drug Authority (EFDA) initiated an electronic regulatory information system to improve four quality dimensions (Efficiency, trust, reliability and support). Therefore, the purpose of this study is to assess the impact of quality of e-government service dimensions that are provided by EFDA via i-register service. To meet these objectives, data collection questionnaires were prepared and provided to a sample of 260 respondents. A systematic random sampling was used to collect the data from customers who used e-service in FDA via i-register. The correlation between service quality dimensions and customer satisfaction was examined with Pearson correlation and regression. The analysis showed a statistically significant positive association between all of the quality dimensions and customer satisfaction. Customer satisfaction was shown to be most impacted by support dimension. The current research suggested enhancing service quality to increase customer satisfaction is crucial. Therefore, EFDA should work over i-register dimension to increase customer satisfaction.

Key words: *Customer Satisfaction, Efficiency, e-services, i-register, Reliability, Support, Trust*

CHAPTER ONE

1. INTRODUCTION

1.1. Background

The process of informing society results in the electronization of services, whose component is e-government. The E-government controls the creation of high-quality digital material and its online distribution. Initially, the use of information and communication technologies (ICT) fundamentally altered a business sector game plan, which then had an impact on the public sector (Stofkova J et al., 2015).

The public sector must adjust to ICT distribution forces that have moved traditional bureaucracy toward easily accessible and useful services, secure e-Government solutions, and simple contact with citizens, corporations, and the institutions of public administration. Over the past few years, governments' electronic services have drawn more and more attention from around the globe. This is because modern development in the area of information and communication technology is necessary and inevitable. The introduction of new service types, such as e-services and the growth of e-government, was made possible by ICT's influence and adoption in the governmental sector. This has a tremendous influence on how residents and companies interact with various government agencies. (Stofkova J et al., 2015; Lemieux, 2016; Andersen et al., 2010; Palanisamy, 2004).

E-government services have piqued the curiosity of people all over the world because they allow governments to carry out their responsibilities in a more effective and efficient way, changing the way it interacts with its constituents, enterprises, or other governmental branches (Ezz, 2005). E-government services are seen as a way to increase administrative transparency and enhance quality of service while reducing cost and all in all lower corruption (UN-ECOSOC, 2003; Zoysa & Letch, 2013).

These e-government services offer a wide range of advantages, particularly in developing nations where public institutions struggle to deliver services to individuals and businesses due to resource limitations. It has been examined in certain situations as a way to reduce costs while

also enhancing quality, response times, and access to services. (Kumar & Best, 2006; Bhuiyan, 2011).

In contrast, a research by Heeks & Stanforth (2007) shows that Governments spent more than US $3 trillion on ICT initiatives between 2000 and 2010, with an estimated failure rate of 60% overall.. This is a worrying issue, especially considering the limited resources available to underdeveloped nations, who cannot afford to invest substantial sums of money in such programs. As a result, their long-term success is crucial, particularly for developing nations facing challenges such as limited resources and dependency on donors. E-government programs still attract significant investment despite their high failure rate (Liu, Zhou, and Chen, 2008; Hanna & Qiang 2005; Dzhusupova, Janowski & Estevez, 2011).

Despite the fact that various governments have made considerable expenditures on e-government programs, there are still things to be clarified from the standpoint of the public good. In order to better comprehend the advantages and return on their investments, government managers require external and objective feedback on their e-government initiatives and results. Therefore, it is important to think about and comprehend the actual value this service has for the public when trying to include them as an official plan (Huang, 2007).

In order to allow seven governmental agencies to provide online services, the Ethiopian government's Ministry of Communications and Information Technology built 49 e-service websites totaling 3.8 million ETB. E-service portals provide a centralized platform and generic tools for online services. Government agencies use the system to provide electronic public services to residents, noncitizens, corporations, and governmental and nongovernmental groups. One of the companies that benefited from the aforementioned ICT project is the Ethiopian Food and Drug Authority (EFDA).

To improve efficiency, openness, and information traceability, the EFDA recently debuted the electronic regulatory information system (eRIS), a web-based service portal. The software consists of three interconnected subsystems called i-License, i-Register, and i-Import.

i-Register manages market authorization. The primary users of this i-register service are importers of pharmaceuticals. These services offer a wide range of advantages, particularly in developing nations where public institutions struggle to deliver services to individuals and

businesses due to resource limitations. The success of the adoption of the services is most strongly influenced by customer satisfaction. Customers will be disappointed or even dissatisfied if there is a poor level of performance, but they will be satisfied and happy if the level of performance is in line with expectations. In Ethiopia, there is a paucity of data that assesses the quality of e-services and its role in achieving customer satisfaction in EFDA. Therefore, it's critical to assess i-register service's quality to make sure that their performance is at the required level.

1.2. Statement of the problem

The public administration institutions' important services, procedures, and activities are described in the business model, which also describes how information, goods, and services that bring value to society are developed and managed. As a result, e-government services attempt to modernize service delivery. Having a working channel to provide accessible service for all (Srivastava & Teo, 2007).

Studies showed that many users of e-government services return to the more conventional methods of gathering information, such as in-person meetings and phone calls, following their initial usage of the services (Allahawiah et al., 2014). The e-government initiatives in poor nations have a meager success rate of only 15%. This statistic demonstrates that, despite the growing significance of offering a variety of e-government services, the assessment of their quality, particularly in developing nations, still requires greater attention (Lee &Lin, 2011).

Service quality is described as consumers' total perception of quality in a virtual environment, and it is one of the most important criteria in evaluating the success or failure of e-government, with implications for all parties involved. In addition, regardless of earlier success, the innovation may be abandoned even after it has been adopted if the system does not satisfy the needs of the users. User happiness is thus seen as one of the key variables in discontinuance elimination (Bhattacharya, Gulla and Gupta, 2010).

Service quality and customer satisfaction has strong relationships while underlining that these two notions are fundamentally separate from the customer's point of view Customer satisfaction is influenced by service quality (Sureshchandar, 2003; Spreng and Mackoy,1996;Oliver 1997).

It has been demonstrated that the success of any service delivery is heavily dependent on the impression of the user. Similarly, the quality of e-services is connected to satisfaction. The greater the perceived quality of an e-service by users, the more satisfied consumers are with the e-service. In addition, which would sequentially determine the user's loyalty and retention (DeLone and McLean, 2003). (Richard & Allaway, 1993).

There are very few studies on e-government services in Ethiopia, and those that are accessible primarily concentrate on e-government implementation, difficulties, and potential (Ayele, 2018; Kitaw, 2006; Mekuriya, 2009; Belachew, 2010; Haile, 2013). Recently, The EFDA established e-RIS as part of the regulatory services offered in order to streamline internal processes, improve transaction efficiency, and boost the openness of contacts with consumers (Pharmaceutical Importers and Wholesalers). The success of this new e-service initiative is essential to ensuring the health and wellbeing of individuals. The ability of e-RIS to fulfill users' requirements and expectations will be a key factor in determining its success, as with any other e-service. A requirement for a successful adoption of the information system is user happiness, which is determined by how well consumers perceive the quality of the electronic services (Gable, Sedera and Chan, 2003).

The EFDA is crucial in ensuring the quality, safety, and efficacy of medical products and services. Effective regulatory tool deployment is urgently required. Due to ineffective pharmaceutical regulation activities in Ethiopia, low-quality pharmaceutical items are available on the market, according to several primary data sources (FDRE, 2009). The patient's health and life may also be in danger if these subpar medications are used (Ratanwijitrasin and Wondemagegnehu, 2002). To do thus, i-Register is the one that manages market authorization used by EFDA regulatory services. It is used to improve efficiency, openness, and information traceability. However, there is no study surveyed in EFDA in order to evaluate the quality of i-register services. Therefore, this study aimed to assess the quality of i-register an e-government services and its role in achieving customer satisfaction

1.3 Research Questions

- Are clients satisfied with the EFDA's i-register service quality?

- Is there a relationship between the i-register dimensions of service quality and customer satisfaction?
- What is the most important i-register service quality dimension in terms of customer satisfaction?

1.4 Objectives of the Study

1.4.1. General Objective

The general objective of this study is to assess the impact of the quality of i-register e-government services and its role in achieving customer satisfaction.

1.4.2. Specific Objectives

- To measure the overall level of customer satisfaction with the quality of i-register service
- To examine the relationship between i-register service quality dimensions and overall customer satisfaction.
- To identify the e-government service quality dimensions that has significant effect on customer satisfaction via i-register.

1.5 Significance of the study

This study may be incredibly relevant for EFDA decision makers since it gives information regarding the quality of service offered to its customers from the customers' perspective. Furthermore, one of the key reasons for offering such services to clients is to earn their trust and confidence. We must determine the perceived universal satisfaction with i-register services and define a few relevant enjoyment factors in this study. Correspondingly, it benefits EFDA in growing and improving its digital offerings. Furthermore, this will help system designers to consider the interest of the user of the app beyond the expected functionalities of the product they design for public use .Consequently, this study will serve as a basis for future research by other scholars.

1.6 Scope and Delimitations of the study

The scope of this look covers one carrier among electronic e-RIS services offered by EFDA. This is i-register services. Because this observation only applies to one specific i-register service, it should not be applied to other e-government services. This study makes a specialty of pharmaceutical agents and importers in Ethiopia, who are the customers of i-register service by EFDA.

The purpose of the study was to determine the impact of i-register service quality variables on customer satisfaction. The sample group used for this study was restricted to pharmaceutical importers and agents who currently use the EFDA's i-register service.

There is no commonly acknowledged approach for evaluating the quality of i-register services. E-GovQual, an e-government quality evaluation paradigm, was used in this study to assess the quality of EFDA's i-register service. This assessment tool consists of 4 important dimensions; Efficiency, Reliability, trust and support.

1.7 Definition of Terms

Customer satisfaction: is the customers' evaluation of a product or service in terms of whether that product or service has met their needs and expectations.

i-register service quality: is the extent to which EFDA website facilitates efficient and effective delivery of services for customers.

i-register service: the services and transactions provided by EFDA through the internet and application of ICT for customers

CHAPTER TWO

2. LITERATURE REVIEW

In this chapter the theoretical and empirical bases for the study will be discussed. In this chapter e-services and e-government and its forms will be discussed. Buckley J. (2003) contends that the definitions of e-service proposed in various researches are truly based on private region revel in and that the term e-government must be used within the public region rather. E-service is a broad notion that encompasses services provided by organizations or individuals via an internet connection. When governments provide services, this is referred to as e-government.

2.1 E-government and its services

Since the development of ICT has impacted the duties and functions of governments, the prevalence of the information age may be largely credited for the development of "e-government" in the context of government (Palanisamy, 2004). For the government to survive in the digital economy, ICT is now a need rather than an option (AL-Rababah & Abu-Shanab, 2010). E-government has been ranked as one of the top priorities for governments worldwide because of this. Despite the fact that ICT has been used in government for more than 30 years, the e-government era from 2000 on has been particularly hailed as a breakthrough for individuals with technology-driven views on change in government (Andersen et al., 2010).

A number of terms, including e-government, e-governance, one-stop government, digital government, and online government, on a global scale, reflect the quest for governmental reform. To achieve this, government officials, residents, and key private sector actors are pushed and pulled to adjust to the usage of ICT in actions like the use of online government services. The broadly used definition of the time period e-government is what changed into stated by using Gartner (2000). It denotes the transformation of internal and external relationships through internet based operation, information and verbal exchange generation with the intent to optimize the carrier shipping, participation of people and governance.

Jeong (2007) explained e-government as the appropriate use of ICT and online technologies to improve the efficacy and efficiency of service delivery within communities. Holden, Norris & Fletcher (2003) alternatively described e-government as an electron carrying governmental

offerings using web technologies. According to Backus 2011, e-government services are classified as follows:

Government to Business (G2B)

According to Fang (2002), this type of interaction involves unique offers and information that is shared between the government, which is the public sector, and the business community, which is the private sector. These services include obtaining current business data, downloading any paperwork associated with applications, renewing licenses that have expired, forming new organizations, obtaining permits, and making tax payments. Additionally, they could also involve: sending out memos, instructions, policies, and rules across the whole company network (Davies, 2007). The G2B utility is generally helpful for enhancing the quality and effectiveness of communications and business-to-government interactions (Metaxiotis & Psarras, 2004).

Heeks (2006) contends that in terms of the overall rate of economic growth in the USA, government interactions with industry are significantly more significant than those it has with individuals. This may also be crucial, especially in developing nations that seek to streamline the laborious processes and draw in foreign investors. Additionally, this kind of transaction can help with transparency issues and the elimination of corruption. The e-RIS service provided by the EFDA falls under the G2B category and is used by pharmaceutical importers and wholesalers to access transactional services through i-Import, i-Check In, i-register and i-License portals.

Government to Citizens (G2C)

Citizens are provided with information and services through this dimension. Offering people a variety of options and communication channels for public transactions is these applications' primary goal (Al Shihi, 2006). G2C applications provide services that are focused on the needs of the citizenry in this regard. Some examples of the G2C applications would include information, in accordance with a report released by the Organization for Economic Co-operation and Development (OECD, 2003).

However, because the function of e-government is perceived to go beyond merely delivering basic information and services online, it is vital to include a reference to the political component

in the G2C application. E-government promotes citizen-government interactions by enabling online engagement and electronic voting (Davies 2007).

Government to Government (G2G)

This interaction is regarded to be the core of e-government and identifies the internal operations and statistics interchange among administrative unit groupings (Bonham et al, 2001). G2G initiatives' key goals are to minimize related costs, improve strategic decision-making, and decentralize authority across all levels of government (Heeks, 2006).

G2G applications also offer a cohesive and connected government business enterprise, hence highlighting the idea of integrated products. Additionally, government enterprises and agencies can share information, databases, resources, talents, and abilities through G2G initiatives, which improves the performance and efficacy of strategies (Ndou, 2004). This undoubtedly happens as governments are given the opportunity to communicate more effectively by reducing the duplication and redundancy of information and spoken exchange (Evans & Yen, 2005).

Government to Employees (G2E)

The contact between the government and its workers is addressed in the G2E characteristics. G2E is an excellent tool for encouraging staff collaboration and information exchange. (Ndou, 2004). G2E also refers to budgeting and human resource management, as well as the strategic tools utilized to help the government achieve its objectives (Riley, 2001). G2E services enable government agencies to provide their employees with services and data and to collaborate with management in new ways (Chavan & Rathod, 2009). An innovative aspect of this feature that deserves mention is the integration of workers with back office systems and procedures.

2.2 Service Quality

According to conventional definitions, service quality is defined as the gap between consumers' expectations of the services they will receive and their opinions of such services, (Grönroos, 2001; Parasuraman, Zeithaml, & Berry, 1988). Some previous research defined service quality as the extent to which a service satisfies a customer's criteria or expectations. (Lewis & Mitchell, 1990; Dotchin & Oakland, 1994). It may also be considered as the consumer's overall opinion of the relative superiority or degradation of the services(Zeithaml, Berry, & Parasuraman, 1990).

In order to investigate the concept of service quality, Parasuraman, Zeithaml, and Berry undertook an exploratory study in 1985. It was found that whether clients thought a service was of high or low quality depended on how the actual performance compared to their expectations. In a nutshell, the extent of the discrepancy between consumers' perceptions and expectations could be used to gauge how well services are perceived by the public.

2.3 E-service Quality and E-government Service Quality

Academics have conducted substantial research on the characteristics of e-services (Buckley, 2003; Halaris, Magoutas, Papadomichelaki, and Mentzas, 2007). The definitions of e-service quality and e-government service quality are both changing (Halaris etal., 2007). While e-government service quality places a stronger emphasis on e-government, definitions of e-service quality are more e-business oriented.

E-service quality is defined by Parasuraman (2002) as the extent to which a website facilitates efficient and effective shopping, purchasing, and delivery of products and services. Another definition proposed by Santos J. is the consumers' overall assessment and judgment of the excellence and quality of e-service offerings in the virtual marketplace (2003). The focus of this section is on the front office website's (also known as the portal) service quality (Halaris etal., 2007).

The users' overall evaluation of the quality in the virtual environment, which is referred to as e-government service quality, is one of the key factors that determine whether e-government is successful or unsuccessful (Bhattacharya, Gulla & Gupta, 2012). E-government service quality is concentrated on the front-office website (often referred to as a portal) and overall customer satisfaction (Halaris, etal., 2007).

The combination of the e-government service quality definition and the e-service quality definition can be used to determine how efficient and effective a government website makes service delivery. In the context of electronic governance, the most straightforward way to define quality is how well users' demands are met while using these channels to access services.

2.4 Assessment of E-government Service Quality

Maintaining the caliber of organizations' online offerings is more crucial for retaining clients. Service quality affects both the government and users in the e-government sector and is defined as "users' overall appraisal of quality in the virtual setting and acts as one of the major criteria in evaluating success or failure of e-government" (Bhattacharya, Gulla and Gupta, 2010).

The e-government service measurement is necessary to improve service delivery and boost operational effectiveness in government. The European Commission's Information Society conducts an annual e-government benchmark study to measure the maturity of e-government services and the efficiency of the public sector (Capgemini, 2011). State entities have the opportunity to verify whether the resulting e-service meets user expectations based on the quality of measurement both during and after development (Lehtimäki A et al., 2012).

Four layers of quality assessment categories have been identified by Halaris C. et al. (2006): those are:

- Back office process performance layer, addressing factors mostly found in quality models for traditional government services;
- Site technical performance layer, addressing the factors of the technological performance of the site, such as site dependability, security, etc.;
- Site quality layer, addressing the factors of the site usability, and interface.
- Customers' overall satisfaction addressing the overall degree of quality perceived by the user in comparison to user expectations;

Before, during, and after the development of e-services, an organization's self-assessment can be used to gauge the quality of the e-government service in terms of process, technological, and site performance (Bertot, Jaeger & McClure, 2008). The customer overall satisfaction layer of quality assessment was used for the purposes of this study.

2.5 E-government Service Quality Assessment Model

For researchers looking into e-service quality dimensions and methods to assess service quality, a SERVQUAL model introduced in the middle of the 1980s is regarded as the gold standard. Ten

service quality characteristics for measuring quality are represented by the well-known SERVQUAL model (Parsuraman & Berry, 1985). But later, it was modified to five dimensions. Researchers from diverse fields and application contexts presented many dimensions for evaluating the quality of e-services. By altering the SERVQUAL model, Lee and Lin (2005) suggested an e-service quality strategy. They created the model to investigate how the many aspects of e-service quality dimensions impact e-service quality. Service quality is the primary factor in successful e-commerce, according to Santos (2003), who also suggested the e-service quality model. This model's incubate and active dimensions can boost hit rates, stickiness, and customer retention. The incubate dimension, according to this paradigm, is made up of content, structure and layout, connectivity, appearance, and ease of use. Incentives, security, communication, support, efficiency, and dependability are all part of the active dimension.

To gauge the perceived quality of online shopping sites, SITEQUAL was proposed (Webb & Webb, 2004). By identifying four essential quality dimensions: website design, fulfillment/reliability, privacy/security, and customer services. Wolfinbarger and Gilly (2003) established a model ETAILQ for online shopping in the United States.

Parasuraman, Zeithaml, and Malhotra's E-S-QUAL was developed in 2005 with the aim of defining criteria for evaluating the quality of e-services. They separated the procedure into two phases when creating this strategy. The foundation of the basic E-S-QUAL includes twenty-two items in four main categories: effectiveness, satisfaction, system availability, and privacy. They used the E-RecS-QUAL scale as their second measurement tool, which had eleven elements across three more general dimensions: responsiveness, compensation, and touch. By using this strategy, Parasuraman et al. aimed to present a technique to raise the caliber of e-services (Parasuraman et al., 2005).

2.6 E-GovQual

E-GovQual is a scale which contains multiple items of the quality of e-government service methods for evaluating government websites where consumers look for either information or services (Papadomichelaki, & Mentzas, 2011). The model is based on established ideas and is put out within the SERVQUAL framework, which asserts four factors that affect the quality of e-government websites: effectiveness, trust, dependability, and support. E-GovQual is a highly useful approach for gauging consumers' perceptions of service quality based on an analysis of

websites or portals offering e-government services. The impact of E-GovQual across all parameters on service quality is substantial.

In a different research study published in 2006, Papadomichelaki stated that there are only two basic methods for assessing the caliber of an e-government service. The first is the "introvert approach," in which the organization as a whole is used to assess and analyze service quality. Additionally, he said that a variety of factors, including organizational leadership, back-office practices, and management's commitment to quality, have an impact on service quality. The second strategy, which he dubbed the "extrovert approach," is centered on the caliber of the actual service provided. This strategy is closely related to the service that is provided, such as its usability, dependability, trustworthiness, content, or level of assistance (Papadomichelaki, 2006). Through user surveys, this study uses an extrovert methodology to evaluate the quality of EFDA's e-level services through i-register services.

The current study employed the E-GovQual quality assessment models for a hands-on evaluation of the EFDA's e-government service's level of quality. The first justification is that the study's domain and environment fit these models. Additionally, its user-centric e-government quality evaluation model sought to gauge the perceived quality of e-services. This is crucial because the current study's main objective is to assess the level of consumer satisfaction with e-government services wheras E-S-QUAL focused on website quality. E- GovQual is more in line with the goals of the current study and also includes more complete characteristics. It is a model suggested by Papadomichelaki and Mentzas (2011). It has four major quality assessment dimensions. Those are Efficiency, Trust, reliability and Support.

Efficiency

Easy use of the e-service by customers can be used as a method to measure the efficiency of e-government service. The significant role that this dimension plays in raising the caliber of e-service was also covered by Gefen, Karahanna, & Straub (2003) and Santos (2003). The usage of established relationships with short mesh terms and URL can make consumers enter easily to the website.

According to Zhang and Von Dran's (2001) research, the most crucial element for the governmental domain is "easiness of navigation," which is followed by "clear layout of

information," "up-to-date information," "search tool," and "accuracy of information." Additionally, a government website's usability can be increased by personalizing the information, the accessibility of the website to the choice of customers. Last but not least, customization of the website to the customers helps customers to use the website frequently (Santos, 2003).

Trust (privacy/security)

Trust is defined as the customer's confidence in the website regarding freedom from risk of danger or doubt during the e-service process and consists of privacy and security. The importance of trust in e-service has been emphasized by Gefen et al. (2003) and Zhao & Zhao (2010). Protecting personal information includes not disclosing it to third parties, maintaining anonymity, archiving personal data securely, and giving informed consent. Last but not least, security is primarily described as safeguarding users against the possibility of fraud and financial loss but it is also characterized by ensuring that the entire transaction is carried out as intended. Encrypting messages, controlling access, using digital signatures, and having processes in place for obtaining username and passwords are all ways to increase security.

Reliability

Beneficiaries' trust in the e-government website regarding accurate and timely service delivery is referred to as reliability. The phrase includes accurate service promises and proper technological operation (accessibility and availability). The ability of a system to be used by as many people as feasible without modification is referred to as accessibility, which is a broad phrase. Additionally, the system's capacity to be shown and used regardless of the web browser being used improves accessibility. When a system's service to users is degraded or interrupted due to the breakdown of one or more of its components, this is referred to as its availability. It shows the likelihood that a service is accessible.

Support (interactivity)

Support is the assistance offered by the business to clients when they are conducting business or in search of information. This assistance may come in the form of clear instructions, FAQs, and help pages on the website, as well as the availability of different communication channels

(phone, e-mail, message boards, etc.). It is necessary to include contact information so that specific counsel can be provided by email or a more conventional channel like the phone, fax, or postal mail in circumstances where the aforementioned options are insufficient.

The quality dimensions of service quality described by Parasuraman et al. (1988) can be applied in situations where users interact with organization employees, such as when customers ask questions that need to be answered quickly, when employees are knowledgeable or considerate or when they need to solve a problem. The capacity to monitor a transaction's development and status is also viewed favorably. According to Zeithaml, Parasuraman, and Malhorta (2002), the Support component only applies when users encounter issues.

2.7 Customer Satisfaction

Customer satisfaction refers to how well a product or service meets the wants and expectations of the consumer. The emotion of satisfaction is the result of comparing what was got to what were anticipated (Bitner & Zeithaml, 2003); Armstrong & Kotler, 1996). A general definition of satisfaction is an attitude of approval toward an experience or an object. According to published works, website visitors should offer their own opinions in evaluation responses. The website user satisfaction is assessed by the attitude of the organization's website users. (Muylle, Moenaert & Despontin, 2004).

Studies showed customer satisfaction can be increased when there is a favorable experience. This leads to increased intention to use the website and in turn leads to greater usage of the website (DeLone & McLean, 2003). Therefore, contentment is a behavioral reaction to the total of one's attitudes or sentiments toward many things influencing that circumstance (Bailey and Pearson, 1983). As a result, it is treated as a system-wide indicator of success rather than a specific dimension of success (Gable, Sedera, & Chan, 2003). This indicator is explained as the degree to which users feel that the service satisfies their needs (Liu, Zhou & Chen, 2010).

Notwithstanding earlier success, the innovation may be abandoned even after it has been adopted if the system does not satisfy the needs of the user. User happiness is thus seen as one of the key variables in discontinuance elimination. The user's unhappiness results in quitting, but user satisfaction results in intention to continue. There are two sorts of discontinuance: replacement and disenchantment, which is a similar idea. Disenchantment discontinuation is the decision to

drop an innovation due to discontent with its performance, as opposed to replacement discontinuance, which is the choice to drop an idea in favor of a superior one (Roger, 1995; Oliver 1980;Wangpipatwong et al., 2008).

The quality of e-government services is centered on the user experience and the front office website or portal (Halaris etal., 2007). For the purpose of ascertaining the number of people and business are actually appreciating the value of these services, it is crucial to evaluate the levels of satisfaction or discontent and perceptions for the different services-offering entities, such as governments, citizens, and corporations (Moorman, Blakely & Niehoff, 1998).

2.8 The Quality of e-government service and customer overall satisfaction

In recent years, both business and academia have placed a greater emphasis on customer happiness and service quality. While stressing that these two concepts are conceptually different from the perspective of the customers, they have strong connections between service quality and customer satisfaction. Service quality results in customer satisfaction. The quality of e-services is also favorably correlated with satisfaction. Users are more satisfied with an e-service when they view it as having a greater quality (Sureshchandar et al, 2003; Spreng and Mackoy, 1996; DeLone & McLean, 2003).

According to studies, the quality of e-government services directly affects how satisfied consumers are with those services (Verdegem, 2009). Consumer satisfaction is typically thought of as a result of high-quality service, which indicates that it positively correlates with the caliber of the goods or services offered to the customer. Along with a higher degree of perceived product or service quality, it is also thought that customer satisfaction is boosted. The cause is quality, and the result is satisfaction. Research has shown a causal connection between the quality of e-government services and customer happiness (Halaris etal, 2007; Osman, Anouze, Irani, Lee & Weerakkody, 2011).

2.9 Conceptual Framework

In the current study, efficiency, trust, reliability, and support were employed as independent variables to quantify customer satisfaction in i-register service provided by EFDA. These service quality characteristics were modified from E-GovQual, a multiple-item scale approach for evaluating the e-government service quality of official websites (Papadomichelaki & Mentzas,

2011). The significance, impact, and link between the independent variables and the dependent variables were assessed using a statistical model (customer satisfaction).

The following conceptual framework was adopted from Papadomichelaki & Mentzas (2011)

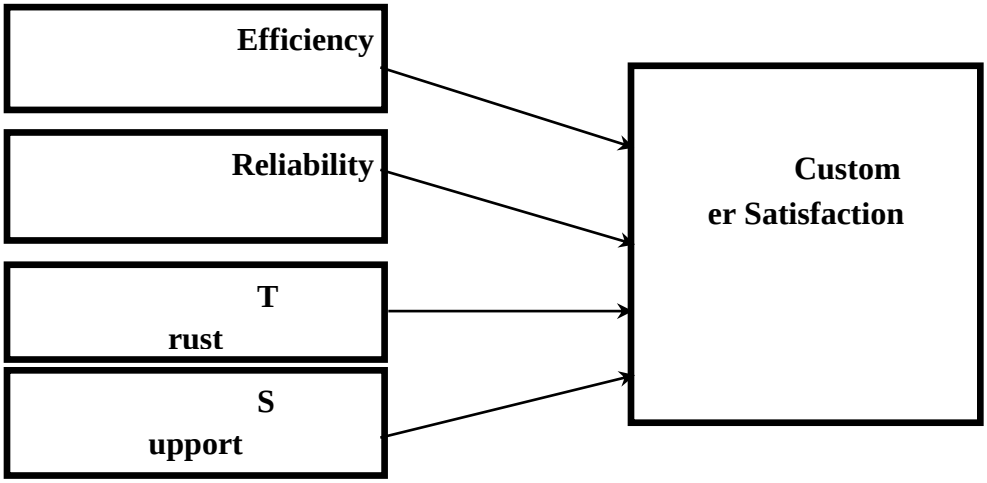

Figure 2.1: The conceptual frame of this study which adopted from Papadomichelaki & Mentzas (2011)

The following hypotheses were proposed from the conceptual framework.

H1: i-register service quality has direct impact on overall customer satisfaction

H1a: Efficiency has a positive impact on customer overall satisfaction

H1b: Trust has a positive impact on customer overall satisfaction

H1c: Reliability has a positive impact on customer overall satisfaction

H1d: Support has a positive impact on customer overall satisfaction

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 Introduction

The research methodology used to carry out this research thesis is covered in this chapter. In this chapter, we discussed the study area's description, the research approach, the research design, the study and source population, source and study population, the data collection methods, the data analysis, and ethical considerations.

3.2 Description of the study area

The study was carried out at Ethiopian Food and Drug Administration (EFDA), Addis Ababa. The EFDA has different responsibilities including registration of medicines, licensing and inspecting of healthcare professionals, pharmaceutical and food industries, and health facilities. The EFDA authority developed a citizen charter, and the registration process for medicines should be based on it in order to carry out the mandate. The authority outlined the prerequisites that manufacturers and importers of medicines must meet in the citizen charter. For local drug manufacturers, the required time for new medicine registration was one and a half months, and not longer than three days for re-registration of a drug. Despite the fact that the registration process was for new medication importers, the regulatory set the time limit at two days.

Although the regulatory body specified a time limit of two days to three months for the registration process, it was for new medication importers. All Ethiopian pharmaceutical importers and distributors can now use the EFDA's services thanks to the opening of its online service portal in 2018. i- Register services represent a fundamental shift in how information is presented and services are provided.

3.3 Research Approach

In order to determine the effect of the quality i-register service aspects offered by EFDA on achieving customer satisfaction, this research used a quantitative research approach. This method produced quantitative data that was rigorously analyzed quantitatively.

3.4 Research Design

A cross-sectional design was used to assess how the EFDA's i-register service quality dimensions affect achieving customer satisfaction. It used both explanatory research and descriptive surveys. The descriptive study requires data plan, data gathering, error identification, data code and store. They also include a structured questionnaire where respondents can choose from a predetermined list of options. Explanatory and descriptive research are frequently confirmatory, that is, they are used to evaluate certain hypotheses that have already been put out (Hair et al., 2003). It starts with a well-defined structure and then moves on to gathering actual data to investigate the topic being studied (Malhotra & Varun, 1998).

3.5 Source and Study Population

A questionnaire was used to get information from a primary source on how customers felt about the quality and satisfaction of i-register services. In Ethiopia, there are over 2000 pharmaceutical importers. All i-register service users were the source of data for this study. Customers that regularly interact with EFDA's i-register service were the study population. The number of pharmaceutical importers which regularly interact with EFDA's i-register service were found to be 772.

3.6 Sampling Procedure

3.6.1 Sample Size Determination

Due to the size and the period of time, the investigator did not include all customers who use i-register service. The researcher must therefore select samples from the entire population in order to avoid these limitations. Studies also recommended that when difficulty is faced to include the total population, it is possible to draw a sample from the total population and make a conclusion but the sample should be just right not too big or too tiny. It should be ideal; an ideal sample is one that satisfies the criteria for effectiveness, representativeness, dependability, and adaptability (Kothari, 2004).

Krejcie & Morgan (1970) developed a table utilizing the sample size formula for finite population to make figuring out the sample size for a finite population easier. The population sample for this study was selected based on the 1970 Krejcie Morgan table. 260 customers were

judged to be the sample size most typical of the EFDA's consumers in this study. Krejcie and Morgan's (1970) sample size determination table was used to make the decision. Using the Krejcie and Morgan sample size calculation equation is equivalent to doing this. The sample size calculation equation, which is stated below, is based on Krejcie and Morgan (Krejcie &Morgan, 1970). It was based on the assumption that the probability of making a type I error is less than 5% or 0.05 when P = 0.05.

$n=X^2 NP (1-P) \pm d^2 (N-1]) +X^2 P (1-P)$

Where,

n= the sample size required

X= Chi squared value for df1 at the level of confidence $P=0.05 \approx 3.84$

N= Size of the population

P= Proportion (The population proportion assumed P=0.50. Because it would provide the maximum sample size)

d = the degree of accuracy expressed as proportion (0.05)

Table 3.1: Krejcie and Morgan table to calculate sample size from a given population

N – n	N – n	N – n	N – n	N – n
10 – 10	100 – 86	280 – 162	800 – 260	2800 – 338
15 – 14	110 – 86	290 – 165	850 – 265	3000 – 341
20 – 19	120 – 92	300 – 169	900 – 269	3500 – 346
25 – 24	130 – 97	320 – 175	950 – 274	4000 – 351
30 – 28	140 – 103	340 – 181	1000 – 278	4500 – 354
35 – 32	150 – 108	360 – 186	1100 – 285	**5000 – 357**
40 – 36	160 – 113	380 – 191	1200 – 291	6000 – 361
45 – 40	170 – 118	400 – 196	1300 – 297	7000 – 364
50 – 44	180 – 123	420 – 201	1400 – 302	8000 – 367
55 – 48	190 – 127	440 – 205	1500 – 306	9000 – 368
60 – 52	200 – 132	460 – 210	1600 – 310	10000 – 370
65 – 56	210 –136	480 – 241	1700 – 313	15000 – 375
70 – 59	220 – 140	500 – 217	1800 – 317	20000 – 377
75 – 63	230 – 144	550 – 226	1900 – 320	30000 – 379
80 – 66	240 – 148	**600 – 234**	2000 – 322	40000 – 380
85 – 70	250 – 152	650 – 242	2200 – 327	50000 – 381
90 – 73	260 – 155	700 – 248	2400 – 331	75000 – 382
95 – 76	270 – 159	750 – 254	2600 – 335	100000 – 384

Source: Krejcie and Morgan's (1970)

3.6.2 Sampling Techniques

Getting a sample of the population was thought to be the best course of action for this study because it is hard to collect data from the full population. Systematic sampling was used to obtain a suitable sample for the investigation. In order to generate a sampling frame of pharmaceutical importers, an i-register customer database was employed. 772 pharmaceutical importers who now use the i-register service portal made up the sampling frame. 260 of the clients were chosen using rigorous random sampling. Convenience sampling was used to evaluate survey questionnaires prior to distribution.

3.7 Data Collection Procedures

After reading different literature, a data collection tool was developed. After that, sampled respondents were given structured questionnaires to complete themselves. By having sample clients complete a questionnaire; data from those customers was acquired. In addition to the socio-demographic information, they were questioned about a variety of satisfaction factors related to i-register services in order to gauge their overall satisfaction. The Google Forms survey that was used for this research is displayed in Appendix A. The questionnaire has been created to be as simple and thorough as possible to ensure that the responders comprehend everything that was asked. English was used in the writing.

The questionnaire is intended to gauge respondents' efficiency, trust, dependability, and support levels as well as their socio-demographic variables including age, gender, education level, employment status, and access to the i-register website. The survey has three sections: Section A was made up of a series of inquiries meant to elicit information about the respondents' demographic characteristics. Questions in Section B, which were taken from Papadomichelaki & Mentzas, sought the respondents' opinions of the value of i-register services offered by EFDA. Efficiency, reliability, trust, and support are the four elements of i-register service quality that are measured in this area. A question is included in Section C to gauge overall customer satisfaction with EFDA's i-register services. With anchors ranging from strongly disagree to strongly agree, Sections B and C were evaluated using 5-point Likert scales, where 1 represents strongly disagre and 5 represents strongly agree (Appendix A). The survey was created on the Google Forms platform, and respondents were contacted via email, Telegram and in person.

3.8 Validity and Reliability

The Google Forms questionnaire was pilot tested for its validity and reliability before the actual data collection on 20 participants who were chosen from the initial study sample. The purpose of the form was to create a uniform questionnaire to collect the actual data from the respondents. It is also used to ascertain the validity and increase the reliability of the data collection tools. Based on the customer's comment, the necessary adjustments were made. Customers were asked to participate in this pre-testing not only by answering questions on a Google Forms questionnaire, but also by providing feedback on the tool. Finding any inappropriateness and ambiguity with relation to the materials used was the goal. The goals of this data collection were explained to the

participants. While filling out the questionnaire, they were urged to contact someone with any questions by phone or email. After receiving all of the completed questionnaires for this pilot project, any misunderstandings, errors, or misinterpretations were corrected, and some of the phrases were clarified to reduce confusion. Attention must be given to two specific components of research design in order to lower the likelihood of providing the incorrect response: reliability and validity (Saunders et al., 2003).

Validity

In empirical research, instrument dependability and validation are recognized as essential steps (Straub, Boudreau and Gefen, 2004; Churchill, 1979). In this study, the content validity of the pilot study was used to assess validity. Deductive reasoning is typically used to establish content validity, also known as face validity (Cronbach and Meehl, 1955). It pertains to the conceptual definition of a summated scale and the evaluation of the correspondence of the variables to be included in it (Hair et al., 2006). Content validity is proved, according to Cronbach and Meehl (1955), by demonstrating that the test items are a sample of the universe the researcher is interested in.

Therefore, the extent to which the items created cover the scope of the construct being tested determines content validity (Nunnally and Bernstein, 1994). In order to give assurance that item measures derived from a sample are indicative of the true score in the population, it is related to measurement accuracy (Hair et al., 2006).

In this study, content validity was established during the pilot phase in accordance with Straub, Boudreau, and Gefen's (2004) recommendations by reading the literature and using expert judgment to make sure that test items are representative of the domain they are designed to assess. Through exploratory component analysis, the questionnaire's construct validity and convergent validity were verified.

To guarantee the study's validity, data was gathered from individuals with more expertise utilizing internet services, as well as from trustworthy sources; to ensure the validity of the results, survey questions were developed based on literature reviews and frames of reference. Before the survey began, a set of respondents pre-tested the questionnaire.

Reliability test

The reliability testing was done in order to make sure that the different questionnaire questions were consistently measured before moving on to further research. The level of internal consistency among a group of indicators of a latent construct is measured by reliability (Hair et al., 2010). Test-retest reliability (temporal stability) and internal consistency are two often used measures of a scale's reliability (Pallant, 2010).

However, due to respondents' memories, Churchill (1979) opposes the use of the test-retest reliability scale. Churchill said that customers may provide the same response as their previous response. The internal consistency reliability scale, in contrast, evaluates the extent to which the scale's constituent items all measure the same underlying attribute. The Cronbach's coefficient (α) alpha reliability test is the most widely used indicator of internal consistency.

If other indicators of a model's construct validity are strong, a reliability estimate between 0.60 and 0.70 may be considered acceptable. A reliability estimate of 0.70 or higher indicates good reliability. However, 0.70 is the minimum allowable limit for Cronbach's coefficient (α) (Churchill, 1979). Internal consistency was used in the current study to assess the construct's dependability. The construct's Cronbach's coefficient (α) value was produced during pilot testing using STATA version 16, as indicated in Table 3.2.

Table 3.2: The reliability of the questionnaires'

Reliability statistics	
Chronbachs alpha(α)	**N of items**
0.775	20

Source: STATA output (pilot survey data, 2022)

A pilot testing was performed for 20 customers. Cronbach's Alpha value was 0.775 for all items evaluating service quality and customers overall satisfaction. This showed the instrument had good consistency and reliability. As a result, the pilot study findings were deemed satisfactory, leading to the full-scale data collecting and subsequent analysis being carried out using the modified survey.

3.9 Data analysis

Data were collected, coded, and input into a computer to be analyzed with STATA version 17 software. In the form of a table, descriptive statistics were done and displayed in frequency and percentage. Pearson's correlation was specifically employed in inferential statistics to indicate the relationship, the strength/degree, and the direction of associations between variables. The dependency between independent factors and the dependent variable was demonstrated using regression analysis. Thus, both the strength of the relationships between the variables and the impact of the independent variable on the dependent variable were evaluated, along with statistical significance. Customer satisfaction served as the study's dependent variable. On the other hand, the study's independent variables included the characteristics of i-register service quality (efficiency, reliability, trust, and support).

The regression model used to establish the association between the independent variables with the dependent variables assumed the following equation:

$$Y = \beta 0 + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \beta 4\ X4 + \epsilon$$

Where; Y = Customer satisfaction

$\beta 0$ = Constant or the Y intercept

X1 = Efficiency

X2 = Reliability

X3 = Trust

X4 = Support

$\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$ are regression coefficient of respective variables

ϵ is the error term

3.10. Ethical Considerations

Ethical clearance to conduct this research was acquired from the Ethics Review Committee of the School of Commerce, Addis Ababa University. The participants were chosen mainly to benefit the research under the assumption of having used i-register services, and they were informed that the findings of the survey will be kept anonymous and confidential. In addition, they were informed fully that their participation is voluntary and free from any coercion. The survey was designed, reviewed and undertaken to ensure integrity, quality and transparency. In addition, the contact details (name and email address) of the researcher was included in case respondents have any ethical concerns.

CHAPTER 4

4. DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

In this chapter data presentation, analysis and discussion will be covered and discussed. Descriptive analysis will be employed and discussed for the independent and dependent variables. Inferential statistics was also performed to know how much efficiency, trust, reliability and support explains the overall customer satisfaction.

4.2 Descriptive statistics

From 772 i-register service customers in EFDA, 260 customers were included in the study. Of these, 214 were valid, complete and included for the final analysis. The response rate was 82.3%.

4.3 Socio-demographic characteristics of the customers

Regarding socio-demographic characteristics, most (54.7%) of the respondents were males. About 53.3% of the customers were between the ages of 31 and 40. The majority of customers hold a Bachelor‘s Degree (62.2%). About 32.7% of customers had Master’s degrees and above and the remaining 5.1% had diplomas. Most of the customers (31.7%) were categorized in the work position technical manager position category. About 27.6% of the customers visit i-register service a few times a week. About 2.3% of the customers responded not accessed i-register services at all (Table 4.1).

Table 4.1: Socio-demographic characteristics of customers

Variables	**Frequency (%) (n=214)**
Gender	
Male	117(54.7)
Female	97(45.3)
Age	
21-30	69(32.2)
31-40	114(53.3)
41-50	24(11.2)
51-60	4(1.9)
≥ 60	3(1.4)
Education	
Diploma	11(5.1)
Bachelor degree	133(62.2)
Masters and above	70(32.7)
Work position	
Technical manager	68(31.7)
Registration officer	37(17.3)
Registration consultant	21(9.8)
Pharmacist	41(19.2)
Others	47(22.0)

i-register services access	
Multiple times a day	27(12.6)
Once a day	58(27.1)
A few times a week	59(27.6)
A few times a month	40(18.7)
Less than once a month	25(11.7)
Not at all	5(2.3)

Source: STATA output (Survey data, 2022)

4.4 Reliability and Validity

The independent variables (efficiency, trust, reliability and support) that were the subject of the current investigation were evaluated using the exploratory factor analysis (EFA). Convergent validity in EFA is based on average variance extracted (AVE) and factor loadings i.e. construct reliability of each item. When the combined reliability improved and the value of AVE was greater than 0.05, all construct elements had convergent validity. All factor loadings AVE exceeded 0.5. Every Alpha value in this study was higher than 0.7 which demonstrates acceptable reliability. Bartlett's test of sphericity was significant at $p = 0.000$ which indicated that the data are eligible for factor analysis. The KMO measure of sampling adequacy was above the recommended threshold value of 0.7 for constructs of e-government quality dimensions (Table 4.2).

Table 4.2: Exploratory factor analysis of independent variable measurement scale items

Constructs	**Items**	**Factor loadings**	**Cronbach Alpha (α) value**	**AVE**	**Kaiser Meyer-Olkin (KMO) value**	**Bartlett's Test of Sphericity**	
						Approximate Chi-Square	**Sig.**
Efficiency	E1	0.5980	0.7709	0.6153	0.7184	251.27	.000
	E2	0.8221					
	E3	0.7009					
	E4	0.5342					
Trust	T1	0.5298	0.8179	0.6658	0.7425	343.48	.000
	T2	0.7505					
	T3	0.8203					
	T4	0.7748					
Reliability	R1	0.5406	0.8234	0.5609	0.8383	406.09	.000
	R2	0.72.92					
	R3	0.7611					
	R4	0.6479					
	R5	0.6008					
	R6	0.6495					
Support	S1	0.7510	0.8661	0.6624	0.7553	432.2	.000
	S2	0.7033					
	S3	0.8526					
	S4	0.8015					

Source: STATA output (Survey data, 2022)

4.5 i-register service quality dimensions: Efficiency, Trust, Reliability and Support

4.5.1 Customers' perception towards efficiency

Four items were used to evaluate the efficiency component of i-register service quality offered by EFDA. On those four questions, the customer's perception or level of agreement was calculated and reported as frequency and percentage. More than half (57.0%) of the customers agreed on easy use of the i-register site. About 52.8% of the customer's agreed on the up-to-date information provided on i-register. More than 51% of the respondents agree that i-register service is well organized and customized to individualized users' needs (Table 4.3).

Table 4.3: Customer's perception on efficiency of i-register service

Customers perception towards the efficiency of i-register service (n=2014)	**Strongly Disagree n (%)**	**Disagree n (%)**	**Neutral n (%)**	**Agree n (%)**	**Strongly agree n (%)**
i-register site is easy to use	0(0.0)	6 (2.8)	49(22.9)	122(57.0)	37(17.3)
i-register site is well organized and easy to follow	5(2.3)	11 (5.1)	59(27.6)	110(51.4)	29(13.6)
i-register site is customized to individual users' need	7(3.3)	9 (4.2)	57(26.6)	111(51.9)	30(14.0)
i-register site provide up to date information	2(0.9)	13 (6.1)	59(27.6)	113(52.8)	27(12.6)

Source: STATA output (Survey data, 2022)

4.5.2 Customers' perception of Trust

Trust dimension of i-register service quality was measured through four item questions. About 57% of the customers agreed that the acquisition of user name and password for i-register sites is secure. More than half of the customers agree on the security of data archiving and usage only for the intended purpose (51.9% and 52.8% respectively) (Table 4.4).

Table 4.4: Customer's perception on trust of i-register service

Customers perception towards the trust of i-register service (n=2014)	**Strongly Disagree n (%)**	**Disagree n (%)**	**Neutral n (%)**	**Agree n (%)**	**Strongly agree n (%)**
Acquisition of user name and password for i-register site is secure	0(0.0)	6 (2.8)	49(22.9)	122(57.0)	37(17.3)
Only the necessary data are provided for authentication on i-register site	5(2.3)	11 (5.1)	59(27.6)	110(51.4)	29(13.6)
Data provided by users on i-register site are archived securely	7(3.3)	9 (4.2)	57(26.6)	111(51.9)	30(14.0)
Data provided by users on i-register site are used only for the reason submitted	2(0.9)	13 (6.1)	59(27.6)	113(52.8)	27(12.6)

Source: STATA output (Survey data, 2022)

4.5.3 Customers' perception of Reliability

More than (54.2%) of the customers are indifferent on i-register site performance of the service successfully upon first request whereas 24.3% disagreed on i-register site's availability and accessibility whenever it is needed (Table 4.5).

Table 4.5: Customer's perception on reliability of i-register service reliability

Customers perception towards the reliability of i-register service (n=2014)	**Strongly Disagree n (%)**	**Disagree n (%)**	**Neutral n (%)**	**Agree n (%)**	**Strongly agree n (%)**
Forms on i-register site are downloaded and uploaded in a short time	9(4.2)	38 (17.8)	83(38.8)	59(27.6)	25(11.6)
i-register site is available and accessible whenever you need it	9(4.2)	52(24.3)	84(39.3)	60(28.0)	9(4.2)
i-register site performs the service successfully upon first request	16(7.5)	36(16.8)	116(54.2)	39(18.2)	7(3.3)
i-register site provides service in time	8(3.7)	36 (16.8)	92(43.0)	67(31.3)	11(5.2)
i-register site pages are downloaded quickly enough	12(5.6)	40 (18.7)	78(36.4)	75(35.1)	9(4.2)
i-register site work properly with your default browser	2(0.9)	34 (15.9)	82(38.3)	72(33.7)	24(11.2)

Source: STATA output (Survey data, 2022)

4.5.4 Customers' perception of Support

More than 46% of the customer's agreed in all items of support of i-register service (Table 4.6).

Table 4.6: Customer's perception on support of i-register service quality service

Customers perception towards the support of i-register service	**Strongly Disagree**	**Disagree n (%)**	**Neutral n (%)**	**Agree n (%)**	**Strongly agree**

(n=2014)	n (%)				n (%)
Employees of EFDA show a sincere interest in solving users' problem	6(2.8)	22 (10.3)	47(22.0)	101(47.2)	38(17.7)
Employees give prompt replies to user inquiries	14(6.6)	18(8.4)	72(33.6)	100(46.7)	10(4.7)
Employees have the knowledge to answer user inquires	6(2.8)	18 (8.5)	36(16.8)	109(50.9)	45(21.0)
Employees have the ability to convey trust and confidence	0(0.0)	16 (7.5)	42(19.6)	104(48.6)	52(24.3)

Source: STATA output (Survey data, 2022)

4.6 Customers overall satisfaction

Customers perception of trust had the highest mean score (mean= 4.01 ± 0.708) making it the most prominent and conspicuously visible i-register service quality parameter followed by efficiency (mean= 3.74 ± 0.628), support (mean= 3.68 ± 0.789) and reliability (mean= 3.15 ± 0.678). The overall customer satisfaction of i-register site was (3.52 ± 0.710) by using mean as a cutoff point, more than half, 114(53.3%) of the customers are satisfied and 100(46.7%) were dissatisfied (Table 4.7 and 4.8).

Variable	**Strongly Disagree n (%)**	**Disagree n (%)**	**Neutral n (%)**	**Agree n (%)**	**Strongly agree n (%)**
Customers overall satisfaction towards i-	0(0.0)	15 (7.0)	85(39.7)	102(47.7)	12(5.6)

register service					

Table 4.7: The overall customer satisfaction

Source: STATA output (Survey data, 2022)

Table 4.8: The overall satisfaction of customers towards i-register service

Variables (N=214)	**Mean± Standard deviation**
Efficiency	3.74±0.628
Trust	4.01±0.708
Reliability	3.15± 0.678
Support	3.68±0.789
Overall how satisfied are you with i-register service provided by EFDA	3.52± 0.710

Source: STATA output (Survey data, 2022)

4.7 Inferential Statistics

4.7.1. Pearson's Correlation Analysis

The association between i-register service quality dimensions (efficiency, trust, reliability, and support) and customer satisfaction was calculated using Pearson's correlation. The four i-register

service quality parameters and customer satisfaction showed a strong positive correlation. All of the associations between customer satisfaction and the quality of the e-government services in this study were significant at P value< 0.01. Support and customer satisfaction had a relatively strong association (r=0.468, p<0.01). The relationship between trust and customer satisfaction had comparatively the weakest correlation (r=0. 183, p<0.01) (Table 4.9).

Table 4.9: Pearson correlation coefficient of the independent variables and customer satisfaction

	Efficiency	**Trust**	**Reliability**	**Support**	**Customer satisfaction**
Efficiency	1				
Trust	0.438**	1			
Reliability	0.363**	0.145**	1		
Support	0.349**	0.444**	0.370**	1	
Customer satisfaction	**0.205****	0.**183****	0.**409****	**0.468****	1

** Correlation is significant at P value p<0.01 (2-tailed), N= 214

Source: STATA output (Survey data, 2022)

4.7.1. Regression Analysis

Regression analysis was used to determine how much the independent variable explains the dependent variable. Customer satisfaction and the quality dimensions of the components for e-government services were analyzed by regression.

The following tests were run prior to using the regression tests:

Multicollinearity: The associations between independent variables were tested using the Variance Inflation Factor (VIF) test and the Tolerance test, keeping in mind that the VIF should not exceed the value of 10 and the tolerance value should surpass the value of 0.05. All variables' VIF values fell below 10 (1.27 to 1.43) and all variables' tolerance levels were higher than 0.05 (between 0.699 and 0.787). Since there was no multicollinearity among the independent variables, the model employed in this study is accurate. Using this methodology, the dependent variable (customer satisfaction) and the four primary independent variables (quality aspects of e-government services) were entered simultaneously (Table 4.10).

Table 4.10: The multicollinearity test of independent variables

Collinearity Statistics		
Variables	**Tolerance**	**VIF**
Efficiency	0.711	1.41
Trust	0.699	1.43
Reliability	0.787	1.27
Support	0.701	1.43

Source: STATA output (Survey data, 2022)

Shapiro wilk test: All of the independent variables were insignificant i.e P value greater than 0.05. This showed that the normality of the data (Homoscedasticity). Additionally, when using multiple linear regressions, the researcher runs the risk of discovering significant beta coefficients by chance if the number of instances is low compared to the number of independent variables in the regression (Garson, 2009). Even for exploratory research, fewer than five cases for each independent variable are typically regarded as inadequate. A general rule of thumb for assessing beta coefficients is to have n $\geq$104 + m, where m is the number of independent variables, according to Tabachnick and Fidell (as stated in Garson, 2009). For this study, there are four independent variables, or m, and 214 participants, or n. In order to accomplish the goals

of this study, there is no issue with the sample size for performing the multi regression analysis (Garson, 2009; Cohen, Cohen, West & Aiken, 2003).

The analyses showed that the multiple regression models used in this study meet the criteria needed to guarantee the reliability of its significance test. This showed that there was a statistically significant correlation between customer satisfaction and the quality of e-government services. The model summary section of the output is crucial for describing the goodness of fit and standard error of the estimate (R square). This study analysis explains the strength of the relationships between the several independent variables and the dependent variables (Table 4.11).

Table 4.11: Model Summary

Model	**R**	**R Square**	**Adjusted R Square**	**Std. error of the estimate**	**Change statistics**				
					R Square	**F Square**	**df 1**	**df2**	**Sig. F change**
1	0.8458[a]	0.7154	0.2988	0.3873	0.7154	128.07	4	210	0.000

a. Predictors: Constant, E, T, R, S

Source: STATA output (Survey data, 2022)

According to the current findings, independent variables are responsible for 71.54% (R^2=0.7154) of the fluctuations in the dependent variable (customer satisfaction). It denotes that all independent variables and a dependent variable are positively correlated. The F statistic =128.07 were significant at the 1% level (P value< 0.01), indicating that the suggested model was appropriate. This suggested that the whole model was fit and that there was a statistically significant relationship between customer satisfaction and service quality parameters. The dispersion of actual values from the regression line is described by the standard error of estimates. With a standard error of estimate of 0.3873 provided by this model, it can be concluded that the actual data is only 38.73% skewed from the regression line. The coefficient of

each variable showed that, while holding all other factors constant, a change in the dependent variable might be anticipated from a change in that particular variable.

ANOVA Analysis

The ANOVA test is used to assess the study's level of significance. The mean square of the model indicates the average experimental effect, whereas the sum of squares of regression represents the overall experimental effect (the impact of service quality characteristics on customer happiness). The sum of squares of residuals, however, reveals that certain random mistakes in the data are present due to some natural incidence. The value of the Sig. column is the main focus of the researcher's attention out of all the data in the ANOVA table. The probability of an F-value of that size occurring by chance is shown in this column; in this case, the probability is 0.000, indicating that the likelihood of occurrence is less than 0.1%. The effect is regarded to be more important if the P-value in this column is smaller than the crucial value, set by researchers at 0.01; the further away the P-value is from the critical value, the more insignificant the results (Table 12).

Table 4.12: ANOVA analysis

ANOVA[a]

Model	**Sum of Square**	**df**	**Mean Sqaure**	**F**	**Sig**
Regression	76.858	4	19.21	128.07	0.000[b]
Residual	30.567	210	0.15		
Total	107.425	214			

a. Dependent variable: Overall how satisfied are you with the e-services provided by EFDA via i-register

b. Predictors: constant, E, T, R, S

Source: STATA output (Survey data, 2022)

As shown in the above table, P-value is less than 0.01 indicating that there is a meaningful relationship between the variables. Therefore, we can conclude that Efficiency, trust, reliability and support have a significant impact on customer satisfaction. The value of the sum of squares of regression, which is 76.858 much larger than the sum of squares of errors, at 30.567, can be used to infer the direction of the relationship. It demonstrates a strong correlation between the variables.

Regression model

$Y=\beta 0+ \beta 1x1+\beta 2x2+\beta 3x3+ \beta 4x4 + \epsilon$

Customer satisfaction= -2.076 + 0.021 (Efficiency) + 0.016 (Trust) + 0. 279 (Reliability) +

0.379 (Support) + ϵ (error)

The individual model variables support and reliability were found to have a significant and positive impact on customer satisfaction, with support having the highest effect (ß = 0. 573, t = 5.432, P value <0.01) and reliability having the second-highest effect (ß = 0. 398, t =4.22, P value < 0.01). The results of the regression analysis revealed how one variable affects another. The impact of i-register service quality factors on customer satisfaction was demonstrated. According to the regression table, there would be an increase in the dependent variable (customer satisfaction) by 0.573 units for every unit for support is increased. This demonstrates that customer assistance has a positive impact on customer happiness; for example, if the reliability of i-register service increases by 100%, customer satisfaction will rise by 57.3%. Due to the fact that the P-value in the table is substantially lower than 0.01, the findings are very significant. We can draw the conclusion that the influence of each factor on customer happiness and efficiency is different, with trust having the least impact.

Regression analysis clearly demonstrates that the H1c and H1d hypotheses are supported at a P level of less than 0.01. H1d, which states that support increases customer satisfaction, had a higher influence than the other hypotheses. The standardized coefficient beta in this instance was 0. 573 whereas H1a and H1b the weakest among the hypotheses (Table 4.12).

Table 4.13: Regression summary of i-register service quality to customer satisfaction (N=214)

Coefficients						
Model		**Unstandardized coefficients**		**Standardized coefficients**	**t**	**Sig.**
		B	**Std. error**	**Beta**		
1	Constant	-2.076	0.195		-10.666	.000
	Efficiency	0.031	0.102	0.021	0.0307	.031
	Trust	0.023	0.101	0.016	0.225	.043
	Reliability	0.398	0.094	0.279	4.228	.000
	Support	0.573	0.106	0.379	5.432	.000

Source: STATA output (Survey data, 2022)

4.8 Discussion

This study tried to assess the quality of i-register services and its role in achieving customer satisfaction at Ethiopian Food and Drug Authority. Customer happiness is influenced by service quality (Sureshchandar, 2003; Spreng and Mackoy, 1996; Oliver 1997). E-service quality also has a favorable relationship with satisfaction. Users are more satisfied with an e-service when they view it as having a greater quality (DeLone and McLean, 2003).

All factor loadings were higher than 0.5 in the current study, and all AVE values were higher than 0.5 which ranged from 0.5609 to 0.6658). Convergent validity in EFA is based on AVE and constructs reliability of each item (factor loading). As long as the AVE value is more than 0.05, all construct items are legitimate. As a result, the finding provides significant evidence for the measures' convergent validity (Hair et al., 2006).

The Cronbach's alpha values were used to evaluate the reliability. In this study all Alpha values were greater than 0.7 and demonstrated acceptable reliability (Nunnally & Bernstein, 1994). Bartlett's test of sphericity was significant (P value = 0.000), indicating that the data are suitable for factor analysis. The KMO measure of sampling adequacy was above the recommended cutoff value of 0.7 for constructs of i-register service quality dimensions (Hair et al., 2010).

The most dominating i-register service quality component displayed by i-register was perception of trust with the highest mean score (mean= 4.01.708), making it clear that a significant portion of consumers are satisfied with the privacy and security provided by the EFDA. The EFDA did this by giving clients safe usernames and passwords. Additionally, the Authority offers assurances about user privacy and data security. The survey also showed that customers have a high level of confidence in the i-register website's ability to provide e-services without danger or uncertainty. Studies have also highlighted the value of trust as a crucial element of e-service. Informed permission, keeping anonymity, securely storing personal data, and not releasing personal information to third parties are all part of protecting personal information (Gefen et al, 2003; Zhao & Zhao, 2010).

Customers rely on the e-government website's reliability for accurate and prompt service delivery. Accurate service promises and proper technology operation are examples of reliability (accessibility and availability). Reliability received the lowest rating in this survey

(mean=3.15.678). Customers regard i-first-time register's success rate and the speed at which forms may be uploaded and downloaded to be inadequate. According to this conclusion, the authority should emphasize the importance of performing the service correctly the first time.

The overall satisfaction of customers of i-register site was (mean= 3.52 ± 0.710). Customers were moderately satisfied with the electronic services offered by EFDA through i-register. This conclusion, in the researcher's opinion, supports the descriptive analysis that produced the independent variable items in this study. Participants in the study's sample group express their satisfaction with the electronic services offered by the EFDA. These services are distinguished by their effectiveness, dependability, security, and the perception of the benefit received by the user about the degree of assistance received in carrying out their transactions without having to physically visit the institution. The results of the current study showed that the customer satisfaction with the electronic services offered by the EFDA via i-register was significantly impacted by the quality dimensions of e-government services. This finding was in line with a number of earlier researches conducted in various fields and nations, particularly those by Chang, Wang, and Yang (2009), Hassan (2006), and Kayabsi & Buyukarslan (2013).

The research revealed that the findings broadly supported all hypotheses. Customers' satisfaction with the electronic services offered by EFDA was found to be significantly impacted by the support characteristics of employees' sincerity, promptness, knowledge, trust, and confidence. As a result, staff members offer satisfactory customer service. The degree of customer satisfaction revealed this outcome. Additionally, this study supports earlier research by Kayabsi & Buyukarslan (2013) and Al-Mhamed (2012).

Because this study demonstrated the high degree of consumer knowledge of the security and privacy dimension, trust that constitutes privacy and security also had a major impact on the customers' satisfaction with electronic services offered by EFDA via i-register. The outcome was in line with other research in several fields by Scheduler and Schmidt (2004), Al-Hnaite (2005), Abu-zaid (2006), and Hassan (2006).

Delivering improved i-register service quality provides higher customer satisfaction when there is a positive link between two or more variables, such as when customer satisfaction and i-register service quality dimensions are positively associated. According to the study findings,

customers who felt that e-government service quality practices were supported more strongly reacted more favorably toward customer satisfaction. Support was found to be the service quality dimension that has the greatest impact on customer satisfaction (i.e., had the highest correlation scores). This confirms that support is perceived to be a dominant i-register service quality, indicating that improvements in reliable i-register service and better customer support have a significant impact on the level of customer satisfaction.

CHAPTER FIVE

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

The main goal of this research was to determine how the EFDA electronic regulatory information system affected customer satisfaction via i-register services. The study had four service quality parameters (i.e. efficiency, trust, reliability, and support) which have a considerable effect on customer satisfaction. The study basically used internet based self-administered structured questionnaires to collect necessary data on the Google Forms platform. Kreijcie and Morgan sample size table is used to calculate the sample size for a known population, and 260 samples selected for the study.

The results of this study indicate that trust (mean= 4.01 ± 0.708) is the most important e-government service quality dimension displayed by i-register. According to the results of a correlation analysis using Pearson correlation, there is a significant positive correlation between the four aspects of the quality of e-government services and customer satisfaction. Relatively, support and customer satisfaction have the highest correlation ($r=0.468$, $p<0.01$) followed by reliability ($r=0.409$, $p<0.01$).

All aspects of the quality of e-government services are significant predictors of customer satisfaction, according to the regression study. According to the findings, support had the greatest effect on customer satisfaction (ß = 0. 573, t =5.432, p < 0.01), followed by reliability (ß = 0. 398, t =4.22, p < 0.01).

5.2 Conclusion

Customer satisfaction is a key factor in determining how successful an e-government service is. The standard of service provided, in turn, determines customer satisfaction. The study's findings indicated that the majority of the sample's customers (53.3%) of the customers are satisfied with i-register service. However, EFDA's i-register service can still be improved.

Customer perceptions are indicative of what they value in terms of service quality. These views are crucial in establishing how satisfied a consumer is with the services received from the

provider of those services. Therefore, EFDA ought to make an effort to provide services that cater to the unique requirements of the customer. Therefore, it is necessary to ascertain these demands in order to develop value propositions that are designed to meet them.

In the present study, customers prefer support over the other four aspects of the quality of i-register services. Therefore, EFDA ought to take advantage of this factor and use it as a benchmark for assessing the effectiveness of i-register service. On the other hand, all four factors are thought to be crucial in determining how well an e-government service is provided. Therefore, EFDA needs to make sure that they make full use of all four dimensions so that clients have useful benchmarks to evaluate their views of performance against.

The study's findings also revealed a positive association between each of the four e-government service quality dimensions and customer satisfaction, indicating room for improvement across the board and delivering a high quality e-service will lead to a higher customer satisfaction.

5.3 Recommendation

Based on the findings of the present study, the following are recommended:

- All the four service quality dimensions are significant in fostering satisfaction for the customers of i-register site. So it is important to focus on providing improved and high quality to meet the customers demand and increased satisfaction

- Customers place a high value on support, especially task completion, thus EFDA should allot enough time to complete the task and improve online assistance while performing it. Additionally, the bandwidth and connection rates need to be enhanced.

- The service should be made easy to use by giving the necessary details and useful directions regarding the activities. The download time and customer pressure will both be reduced as the website design is improved. As a result, they will find the information quickly and easily. This is done by assuring the beneficiaries that the website is safe and has the programs needed to prohibit any eligible access. This resolves all criticism that is facing the electronic business, especially the ones related to privacy and to the beneficiaries.

- Customers' personal data should only be applied to the services they have ordered. Providing all technical assistance for the electronic website, whether it is for the audio or the visual in Amharic or in English. Additionally, having customer assistance integrated into the website will help to enhance the user experience. Generally speaking, EFDA decision-makers should be aware of the different e-government service quality dimensions.

5.4. Implications for Future Research and Limitations

This study was conducted to determine the relationship between customer satisfaction levels and service quality aspects related to e-government. Future research can be done to examine and take into account the providers' perspective. The respondents in this study were importers, and it is recommended that the sample size be increased in subsequent investigations. Studies should concentrate on including additional i-register users to increase the level of generality and validity.

The fact that the research's questionnaires were written in English is another drawback. The majority of respondents who are not native English speakers may not fully comprehend the survey's given items, which could increase uncertainty about the survey's supplied questions and jeopardize the data set's dependability. Therefore, it is advised that local languages be included in future research. Finally, the technique used in this study may be used as a foundation for research on how satisfied users are with various electronic services provided by the governments of Ethiopia and other nations.

References

Abu-zaid, Mohammed Kher, Saleem (2006). Requirements for success and applicability and future dimensions of e-Government in Jordan. Unpublished doctoral dissertation, University of Arab Amman for graduate studies, Faculty of administrative and financial studies. Jordan

Al-Hawary, I.S., Al-Menhaly, S.M., &Sulieman (2017). The Quality of E-Government Services and its Role on Achieving Beneficiaries Satisfaction. Global Journal of Management and Business Research, 16.

Al-Hnaite, Mohammed (2005). E-government and its impact on the electronic service quality: Case study of the income and Sales Tax Department in Jordan Researches and work sheets, business administration conference, Jordan University, faculty of business administration, 155-193.

Al-Rababah, B. and Abu-Shanab, E. (2010), E-Government and Gender Digital Divide: the Case of Jordan. International Journal of Electronic Business Management, 8(1), 1-8

Ali, M., Asmi, F., Rahman, M., Malik, N. and Ahmad, M. (2017) Evaluation of E- Service Quality through Customer Satisfaction (a Case Study of FBR E-Taxation). Open Journal of Social Sciences, 5, 175-195. doi: 10.4236/jss.2017.59013.

Allahawiah, Sattam and Alsaraireh, Mohammad (2014). The Benefits of Knowledge Management and E-Government in Raising Citizen Engagement - Jordan Case Study. Economics, Management, and Financial Markets, vol. 9 (1), pp. 213- 220.

Al-Mahameed, Isoud Mohammed (2012). The impact of perceived reliability of electronic business systems in user satisfaction: an empirical study in Jordan telecom companies. Management science, 39 (2), pp.163-181

Almarabeh, T. &AbuAli, A. (2010) A General Framework for E-government: Definition Maturity Challenges, Opportunities, and Success. European Journal of Scientific Research, 39(1), 29-42.

AlShihi, H. (2006), Critical factors in the adoption and diffusion of e-government initiatives in Oman. Unpublished doctoral dissertation, Victoria University, Australia.

Andersen, K., Henriksen, H., Medaglia, R., Danziger, J., Sannarnes, M., &Enemaerke, M. (2010). Fads and facts of e-government: A review of impacts of e-government (2003- 2009). International Journal of Public Administration, 33(11), 564

Audeh, Thana'a& Abdul Rahman, Abdul Mlik (2013). Introduction to Scientific Research: Concepts, Basics, Procedures and Evaluation. Cairo: Modern Book Hall.

Backus, M. (2001). ‗E-governance and developing countries: introduction and examples', International Institute for Communication and Development (IICD).

Bailey, J.E. and Pearson, S.W. (1983) "Development of a Tool for Measuring and Analyzing Computer", Management Science, vol. 29, no. 5, pp. 530-545.

Barclay, D., Higgins, C., & Thompson, R. (1995). The partial least squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. Technology Studies, 2 (2), 285 – 309.

Barnes, S.J. and Vidgen, R.T. (2002) Assessing E-Commerce Quality with WebQual: An Evaluation of the Usability, Information Quality, and Interaction Quality of Internet Bookstores. Journal of Electronic Commerce Research, 3, 114-127.

Bertot, J.C., Jaeger, P.T., McClure, C.R. (2008), ―Citizen-Centered E-Government Services: Benefits, Costs, and Research Needs‖, The Proceedings of the 9th Annual International Digital Government Research Conference: 137-142. Montreal, Canada, May 18-211, 2008

Bhattacharya D., Gulla U., Gupta M.P. (2012), "E-service quality model for Indian government portals: citizens' perspective", Journal of Enterprise Information Management, Vol. 25 Iss: 3, pp.246 – 271

Bhattacharya, D., Gulla, U. and Gupta, M.P. (2010) "E-Service Quality Model for Indian Government Portals: Citizens' Perspective", Journal of Enterprise Information Management, vol. 25, no. 3, pp. 246-271

Bhuiyan, S.H. (2011) Modernizing Bangladesh public administration through e- governance: Benefits and challenges. Government Information Quarterly, 28(1), pp.54- 65.

Bitner, M.J., Zeithaml, V.A. (2003). *Service Marketing* (3rd ed.), Tata McGraw Hill, New Delhi.

Bryman, A. and Bell, E. (2007) Business Research Methods, second edn, Oxford University Press, Oxford, UK.

Buckley, Joan (2003). "E-service quality and the public sector. Managing Service Quality, Vol. 13 (6), pp.453 – 462.

Capgemini (2010), Method paper 2010: Preparing the 9th Benchmark Measurement‖, European Commission, Directorate General for Information Society and Media, Brussels, 84 pages

Capgemini (2011), Digitizing Public Services in Europe: Putting ambition into action - 9th Benchmark Measurement, European Commission, Directorate General for Information Society and Media, Brussels, 272 pages

Chang, H. H., Wang, Y. H., & Yang, W. Y. (2009). The impact of e-service quality, customer satisfaction, and loyalty on e-marketing: Moderating effect of perceived value. Total Quality Management and Business Excellence, 20(4), 423-443.

Chavan, G. R. &Rathod, M. L. 2009. E-Governance and Its Implementation. SRELS Journal of Information Management, 46, 17-24.

Churchill, G.A. (1979) "A Paradigm for Developing Better Measures of Marketing Constructs", Journal of Marketing Research (JMR), vol. 16, no. 1, pp. 64-73.

Churchill, G.A. (1995) Marketing Research Methodological Foundations, 6th edn, Elizabeth Widdicombe, U.S.A.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). Applied multiple regression/correlation analysis for the behavioral sciences (3rd ed.). Lawrence Erlbaum Associates Publishers.

Collis, J. and Hussey, R. (2009) Business Research: A Practical Guide for Undergraduate and Postgraduate Students, 3nd edn, Palgrave Macmillan, New York, N.Y. USA.

Cronbach, L.J. and Meehl, P.E. (1955) "Construct Validity in Psychological Tests", Psychological Bulletin, vol. 52, no. 4, pp. 281-302.

Cronin, J.J. & Taylor, S.A. (1992). Measuring service quality: a reexamination and extension, Journal of Marketing, 56(3), 55-68.

Dada, D. (2006) The Failure of E-government in Developing Countries: A Literature Review. The Electronic Journal on Information Systems in Developing Countries, 26(1), 110.

Davies, P. (2007), Models for E-Government, Transforming Government: People, Process and Policy. Vol. 1 (1), pp7–28.

de Leeuw, E.D. (2005) "To Mix or Not to Mix Data Collection Modes in Surveys", Journal of Official Statistics, vol. 21, no. 2, pp. 233-255

DeLone, W.H. and McLean, E.R. (2003) "The DeLone and McLean Model of Information Systems Success: A Ten-Year Update", Journal of Management Information Systems, vol. 19, no. 4, pp. 9-30.

Dotchin, J.A., Oakland, J.S. (1994). Total Quality Management in Services Part 2: Service. Quality. *International Journal of Quality & Reliability Management*, 11 (3), 27-42.

Dzhusupova, Z., Janowski, T., Ojo, A. & Estevez, E. (2011) Sustaining Electronic Governance Programs in Developing Countries. 11th European Conference on e- government; Ljubljana, Slovenia.

Evans, D. And Yen, D. (2005), e-Government: An analysis for implementation: Framework for understanding the cultural and social impact, Government Information Quarterly, 22 (3): 354–373

Ezz, I.E. (2005). The Role of ICT in Sustainable Development: Some Challenges for Developing Countries. 55th Pugwash Conference Hiroshima, Japan. Retrieved January 26, 2012, from http://www.pugwash.org/reports/pic/55/6-10_Ezz.pdf.

Fang, Z. (2002). 'E-Government in Digital Era: Concept, Practice and Development'. International Journal of the Computer, The Internet and Management, 10 (2): 1-2

Federal Democratic Republic of Ethiopia (2009). Business Process Re-engineering: Health and health related Services and Products quality regulation Core process, Ministry of Health, Addis Ababa; Ethiopia.

Federal Democratic Republic of Ethiopia (2010). Food Medicine and Health Care Administration and control Proclamation 661/2009. Federal Negarit Gazette, 16: 5157- 91.

Fricker, R.D. and Schonlau, M. (2002) "Advantages and Disadvantages of Internet Research Surveys: Evidence from the Literature", Field Methods, vol. 14, no. 4, pp. 347- 367.

Gable, G.G., Sedera, D. and Chan, T. (2003) "Enterprise Systems Success: A Measurement Model", In Proceedings of the 24th International Conference on Information Systems, Seattle,Washington, pp. 576-591.

Garson, G. D. (2009). Factor analysis. Retrieved from Statnotes from North Carolina State University, Public Administration Program,
http://faculty.chass.ncsu.edu/garson/PA765/factor.htm

Gartner‘s Four Phases (2000) of the E - Government Model, Gartner Group, Research Note, available at: /ITstrat/Download/Gartner, e-Government.pdf. Accessed April 5, 2022.

Gefen, D., Karahanna, E., & Straub, D. (2003). Trust and TAM in online shopping: An integrated model. MIS Quarterly, 27, 51–90

Gilbert, D., Balestrini, P. and Littleboy, D. (2004) Barriers and Benefits in the Adoption of E-Government. International Journal of Public Sector Management, 17, 286-301. https://doi.org/10.1108/09513550410539794

Gravetter, F. J., &Wallnau, L. B. (2007). Statistics for the behavioral sciences (7th ed.). Thomson Wadsworth.

Gray A. (2004). Access to Medicines and Drug Regulation in Developing Countries: a Resource Guide. London: DFID Health Systems Resource centre.

Grönroos, C. (2001). The perceived service quality concept - a mistake?‖ *Managing Service Quality*, 11 (3), 150-152.

Hair, J.F. Jr, Anderson, R.E., Tatham, R.L. and Black, W.C. (1998). Multivariate Data Analysis. 5th ed., Upper Saddle River, NJ: Prentice-Hall International

Hair, J.F., Babin, B., Money, A.H. and Samouel, P. (2003) Essentials of Business Research Methods, John Wiley & Sons Inc, New Jersey, USA.

Hair, J.F., Black, W.C., Babin, B., J., Anderson, R.E. and Tatham, R.L. (2006) Multivariate Data Analysis, Sixth edition edn, Pearson Education LTD., New Jersey, USA.

Halaris C., Magoutas B., Papadomichelaki X., Mentzas X. (2007), "Classification and synthesis of quality approaches in e-government services", Emerald Group Publishing Limited, Internet Research, Vol. 17 Iss: 4, pp.378 – 401

Hanna, N.K. &Qiang, C.Z.-wei (2005) National E-Government Institutions: Functions, Models, and Trends. Available at:
http://siteresources.worldbank.org/EXTIC4D/Resources/5870635124206634745 6/IC4D_ 2009_Chapter6.pdf

Hassan, Mohamed Abdullah (2006). Relationship between service quality and customer satisfaction in e- commerce environment: a proposed conceptual framework. Journal of business research, 29 (1, 2), pp.17-63.

Heeks, R. (2002) Information systems and developing countries: Failure, success, and local improvisations. The Information Society 18(2):101–112.

Heeks, R. (2003) Most eGovernment-for-development projects fail: How can risks be reduced? http://idpm.man.ac.uk/publications/wp/igov/index.shtml (accessed March, 2022).

Heeks, R.B. (2006), Implementing and Managing E-Government: An International Text, Sage Publications, London

Heeks, R. (2007). Understanding e-Government project trajectories from an actor-network perspective. [online] Available at: https://www.researchgate.net/publication/220393175_Understanding_e-Government_project_trajectories_from_an_actor-network_perspective [Accessed 12 May 2022].

Hesse-Biber, S.N. and Leavy, P. (2006) Emergent Methods in Social Research, SAGE Publications, Inc, New York

Holden, S. H.; Norris, D. F.; Fletcher, P. D. (2003). Electronic government at the local level: Progress to date and future issues. Public Performance & Management Review, 26 (4), June, 325-344

Huang, Z. (2007): A comprehensive analysis of US counties e-Government portals: development status and functionalities. European Journal of Information Systems 16(2), 149

Jeong C.H., (2007), Fundamental of Development Administration. Selangor: Scholar Press.

John Adams, Hafiz t.a khan, Raeside, R. & White, D. (2007). Research methods for graduate business and social sciences students, SAGE Publications Ltd, Mathura road, New Delhi.

Kayabsi, A., Celik B., Buyukarslan, A. (2013). The analysis of the relationship among perceived electronic service quality, total service quality and total satisfaction in Banking sector. International Journal of Human Sciences, 10(2), pp.304-325

Kelly, G., Mulgan, G., Muers, S. (2002): Creating Public Value: An analytical framework for public service reform.

Kheng, L.L., Mahamad, O., Ramayah, T., et al. (2010) The Impact of Service Quality on Customer Loyalty: A Study of Banks in Penang, Malaysia. International Journal of Marketing Studies, 2, 57-66. https://doi.org/10.5539/ijms.v2n2p57

Kim, D.J., Ferrin, D.L. and Rao, H.R. (2009) Trust and Satisfaction, Two Stepping Stones for Successful E-Commerce Relationships: A Longitudinal Exploration. Information Systems Research, 20, 237-257. https://doi.org/10.1287/isre.1080.0188

Kline, R.B. (2011) Principles and Practice of Structural Equation Modeling, 3rd edn, The Guilford Press, New York

Krejcie, R.V., Morgan, D.W. (1970). Determining sample size for research activities, Educational and Psychological Measurement, 30, 607-610.

Kumar, R. & Best, M., (2006) Impact and Sustainability of E-government Services in Developing Countries: Lessons Learned from Tamil Nadu, India. The Information Society, 22(1), pp.1-12.

Layne, K. And Lee, J. (2001). Developing fully functional e-government: A four stage model, Government Information Quarterly, 18 (2): 122-136.

Lee, G. G., & Lin, H. F. (2005). Customer perceptions of e-service quality in online shopping. International Journal of Retail & Distribution Management, 33, 161–176.

Lewis, B.R., Mitchell, V.W. (1990). Defining and measuring the quality of customer service. *Marketing Intelligence & Planning*, 8 (6), 11-17.

Li, H. and Suomi, R. (2009) A Proposed Scale for Measuring E-Service Quality. International Journal of U- and E -Service, Science and Technology, 2, 1-10.

Li, H., Liu, Y. and Suomi, R. (2009) Measurement of E-Service Quality: An Empirical Study on Online Travel Service. 1-13.

Liu, J., Derzsi, Z., Raus, M. &Kipp, A. (2008) eGovernment Project Evaluation: An Integrated Framework. 7th International Conference, EGOV 2008, Torino, Italy, August 31 - September 5, 2008 pp 85 – 97

Liu, Y., Zhou, C. and Chen, Y. (2010) "Customer Satisfaction Measurement Model of e-Government Service", Service Operations and Logistics and Informatics (SOLI), 2010 IEEE International Conference on IEE Explore, Digital Library, pp. 419-423.

Malhotra, M.K. and Varun, G. (1998) "An Assessment of Survey Research in POM: From Constructs to Theory", Journal of Operations Management, vol. 16, no. 4, pp. 407- 425.

Maxwell, J.A. (2005): Qualitative research design: an interactive approach, vol. 2, p. 174. SAGE

Maylor, H. and Blackmon, K. (2005) Researching Business and Management, Palgrave Macmillan edn, New York, N.Y. USA

Metaxiotis, K., Psarras, J. (2004), _E-government: new concept, big challenge, success stores‘, Electronic Government, An International Journal, Vol. 1, No. 2, pp. 141–151. Ministry of Information & Communication Technology (MoICT, 2006).

Muylle, S., Moenaert, R. and Despontin, M. (2004) "The conceptualization and empirical validation of web site user satisfaction", Information & Management, vol. 41, no. 5, pp. 543-560.

Nunnally, J.C. and Bernstein, I.H. (1994) Psychometric Theory, 3rd edn, McGraw-Hill, INC., New York, U.S.A.

O‘Flynn, J (2007).: From New Public Management to Public Value: Paradigmatic Change and Managerial Implications. Australian Journal of Public Administration 66(3), 353–366

OECD (2009), Rethinking e-Government Services: User-centred approaches‖, e-Government Studies, Paris

Oliver, R.L. (1980) "A Cognitive Model of the Antecedents and Consequences of Satisfaction Decisions", Journal of Marketing Research, vol. 17, no. 4, pp. 460470.

Oliver, R.L. (1997). *Satisfaction: A Behavioral Perspective on the Consumer*, McGraw- Hill, New York, NY.

Orgeron, C. and Goodman, D., (2011). Evaluating Citizen Adoption and Satisfaction of E-Government. International Journal of Electronic Government Research, 7(3), pp.57-78.

Osman, I. H., Anouze, A., Irani, Z., Lee, H., Weerakkody, V. (2011b), ―COBRA Framework to Evaluate E-Government Services: A Citizen-Centric Perspective‖, Working paper to be published in Government Information Quarterly journal.

Palanisamy, R. (2004). Issues and challenges in e-governance planning. Electronic Government, an International Journal, 1(3), 253-272.

Papadomichelaki, X and Mentzas, G. (2011), A Multiple-Item Scale for Assessing E-Government Service Quality, in Wimmer, M. Et al. (Eds.), EGOV 2009, Springer- Verlag, Berlin-Heidelberg, Germany: 163–175.

Papadomichelaki, X., Magoutas, B., Halaris, C., Apostolou, D. and G. Mentzasm, (2006),

A Review of Quality Dimensions in e-Government Services. Retrieved 27 February, 2022, from:

Parasuraman, A. (2002), Technology readiness and e-service quality: insights for effective ecommerce‖, E-Commerce Seminar Series North Carolina State University, Raleigh, NC, 17 April

Parasuraman, A. Zeithaml, V. A. and Berry, L. (spring, 1988). SERVQUAL: A Multiple- Item Scale for Measuring Consumer Perceptions of Service Quality. *Journal of Retailing*, 64(1), 12-40.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *The Journal of Marketing*, 49(4), 41–50.

Parasuraman, A., Zeithaml, V.A. And Malhotra, A. (2005). ―E-S-QUAL: A multiple-item scale for assessing electronic service quality‖, Journal of Service Research, Vol. 7, No. 3, pp. 213-234

Portela, M.C.A.S. and Thanassoulis, E. (2005) Profitability of a Sample of Portuguese Bank Branches and Its Decomposition into Technical and Allocative Components. European Journal of Operational Research, 162, 850-866.

Ratanwijitrasin S, Wondemagegnehu E. (2002). Effective drug regulation: A multi- country study. Geneva, World Health Organization.

Reichheld, F.F. & Sasser, W.E. (1990). Zero defections: quality comes to services. Harvard Business Review, Sept.–Oct., pp. 105-111.

Richard, M. D., &Allaway, A. W. (1993). Service quality attributes and choice behaviour. Journal of Services Marketing, vol. 7(1), 59-68

Riley, T.B. (2001) E-government vs. E-governance: Examining the Difference in a Changing Public Sector Climate, The Commonwealth Secretariat and Government Telecommunications and Information Services, Public Works and Government Services, Canada.

Rogers, E.M. (1995) Diffusion of Innovations, 4th edn, Free Press, New York, NY.

Santos J. (2003), "E-service quality: a model of virtual service quality dimensions", Managing Service Quality, Vol. 13 Issue: 3, pp.233 – 246

Saunders, M., Lewis, P. and Thornhill, A. (2003) Research Methods for Business Students, 3rd edn, Person Professional Limited, Prentice Hall, Essex, UK.

Scheduler, K. and Schmidt, B. (2004). Managing The E-Government organization. International Public Management Review,5(1), pp.1-20

Sekaran, U. and Bougie, R. (2010) Research Methods for Business: A Skill Building Approach, 5th edn, John Wiley & Sons Ltd., West Sussex, UK.

Spreng, R.A. &Mackoy, R.D. (1996). An empirical examination of a model of perceived service quality and satisfaction. *Journal of Retailing*, 72 (2), 201-214.

Srivastava, S.C., and Teo, T.S.H. (2007). What Facilitates E-Government Development? A Cross Country Analysis. Electronic Government, vol. (4:4), pp. 365-378.

Stofkova, J., Maris, L. and Soltes, V. (2015). To the problem of information security within the local government. In: 7th International Conference on Education and New Learning Technologies (EDULEARN). Barcelona, pp. 6629-6635.

Straub, D., Boudreau, M. and Gefen, D. (2004) "Validation Guidelines for IS Positivist Research", Communications of the Association for Information Systems, vol. 13, no. 24, pp. 380-427.

Sureshchanndra, G.S., Rajendran, C. &Anantharaman, R.N. (2003). The relationship between service quality and customer satisfaction - a factor specific approach. Journal of Service Marketing, 16(4), 363-379.

Tabachnick, B., &Fidell, L. (2001). Using multivariate statistics (4th ed.). Upper Saddle River, NJ: Allyn & Bacon.

Tan, C.W., Benbasat, I. and Cenfetelli, R.T. (2008) Building Citizen Trust towards E-Government Services: Do High Quality Websites Matter? 217.

UN-ECOSOC (2003) Status of and trends in the development of e-government: Report of the secretariat.http://unpan1.un.org/intradoc/groups/public/documents/un/unpan008253.pdf.

(Accessed January, 2010). UN

United Nations (2012a), E-Government Development‖, United Nations, http://www2.unpan.org/egovkb/egovernment_overview/ereadiness.htm (11.05.2012)

United Nations (2012b), E- Government Survey 2012: E-Government for the People, United Nations, New York.

Verdegem P., Verleye G. (2009), User-centered E-Government in practice: A comprehensive model for measuring user satisfaction, Government Information Quarterly, 26(3): 487–497

Wangpipatwong, S., Chutimaskul, W. and Papasratorn, B. (2008) "Understanding Citizen‘s Continuance Intention to Use e-Government Website: a Composite View of Technology Acceptance Model and Computer Self-Efficacy", The Electronic Journal of e-Government, vol. 6, no. 1, pp. 55-64.

Webb, H.W., &Webb,L.A.(2004).Sitequal: An integrated measure of website quality. Journal of Enterprise Information Management, 17, 430–440.

Wilson, J. (2010) Essentials of Business Research: A Guide to Doing your Research Project, Sage Publications Ltd, London, UK.

Wimmer, M., Codagnone, C., Janssen, M. (2008): Future e-Government Research: 13 Research Themes Identified in the eGovRTD2020 Project. Proceedings of the Proceedings of the 41st Annual Hawaii International Conference on System Sciences, pp. 223

World Bank (2012), Definition of E-Government,http://go.worldbank.org/M1JHE0Z280 (22.04.2012).

Zeithaml, V. A., Parasuraman, A., &Malhorta, A. (2002). Service quality delivery through web sites: A critical review of extant knowledge. Journal of the Academy of Marketing Science, 30, 362–375.

Zeithaml, V.A., Parasuraman, A., & Berry, L.L. (1990). *Delivering Quality Service: Balancing Customer Perceptions and Expectations*, The Free Press, New York, NY: Simon and Schuster.

Zhang, P., & Von Dran, G. (2001). Expectations and rankings of website quality features: Results of two studies on user perceptions. Proceedings of the 34th Hawaii International Conference on System Sciences, Hawaii.

Zhao, J., & Zhao, S. (2010). Opportunities and threats: A security assessment of state e-government websites. Government Information Quarterly, 27, 49–56.

Zoysa, M. R. D. & Letch, N. (2013) ICT4D Project Sustainability: An ANT-based Analysis. Proceedings of the Nineteenth Americas Conference on Information Systems, Chicago, Illinois, August 15-17.

Appendices

Appendix (a): Questionnaire

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

DEPARTMENT OF MARKETING MANAGEMENT

Dear respondents;

My name is Gutu Terefe. The purpose of this study is for a partial fulfillment of the requirements for the Masters of Marketing Management in Addis Ababa University School of Commerce. The objective of this questionnaire is to gather information on the impact of e-government service quality dimensions provided by EFDA on achieving customer satisfaction via i-register: All information you will provide will be kept strictly confidential and shall be used for academic purpose only. On the contrary, the findings of the research may be used to improve the quality of i-register services rendered by EFDA to its customers.

The questioner has three parts. Part one deals with the background information of the respondent, part two deals with a survey on the perception of the actual e-service provided by EFDA via i-register and part three is on the overall customer satisfaction on the quality of i-register service provided by EFDA. The questions don‘t take you more than 10 minutes to complete so you are kindly requested to fill all questions completely.

Thank you very much in advance for your cooperation and time! Please contact me for any questions you might have.

Gutu Terefe: +251913979969
Email: Gututerefe@gmail.com

Part One: Background Information

Please make a tick mark **(√)** or fill in the blank space.

1. **Gender:** Male ☐ Female ☐ Prefer not to say ☐

2. **Age:** 21-30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ >60 ☐

3. **Highest level of education:** Diploma ☐ Bachelor's Degree ☐

Master Degree and above Degree ☐

4. **Work Position**:

Technical Manager ☐ Registration officer ☐ Registration Consultant ☐

Other ☐ If other specify __

5. How often do you view or access i-register.

Multiple times a day ☐ A few times a week ☐ Once a day ☐ A few times a month ☐

Less than once a month ☐ Not at all ☐

Part II: E-service quality dimensions

DIRECTIONS: The following set of statements relate to your feelings and perceptions about the e-services actually provided by EFDA via i-register. For each statement, please show the extent to which you believe i-register has the feature described by the statement. There are no right or wrong answers. Circle any of the numbers that best shows your perceptions and feelings about i-register.

	Questions	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
E1	i-register site provided by EFDA is easy to use	1	2	3	4	5

E2	i-register site map is well organized and easy to follow.	1	2	3	4	5
E3	i-register site is customized to individual users‘ need.	1	2	3	4	5
E4	i-register site provides up to date/fresh information.	1	2	3	4	5
T1	Acquisition of user name and password for i-register site is secure,	1	2	3	4	5
T2	Only the necessary data is provided for authentication on the i-register site.	1	2	3	4	5
T3	Data provided by users on i-register sites are archived securely.	1	2	3	4	5
T4	Data provided by users on i-register sites are used only for the reason submitted.	1	2	3	4	5
R1	Forms on the i-register site are downloaded and uploaded in a short time.	1	2	3	4	5
R2	i-register site is available and accessible whenever you need it.	1	2	3	4	5
R3	i-register site performs the service successfully upon first request.	1	2	3	4	5
R4	i-register site provides service in time.	1	2	3	4	5
R5	i-register site pages are downloaded quickly enough.	1	2	3	4	5

R6	i-register site works properly with your default browser.	1	2	3	4	5
S1	Employees (EFDA) showed a sincere interest in solving users' problems.	1	2	3	4	5
S2	Employees give prompt replies to users' inquiries.	1	2	3	4	5
S3	Employees have the knowledge to answer users' inquiries.	1	2	3	4	5
S4	Employees have the ability to convey trust and confidence.	1	2	3	4	5

Part Three: Customer Satisfaction

In this part of the questionnaire, your valuable information on the overall level of satisfaction regarding the e-service provided by EFDA via i-register will be sought after. Please circle a number that shows your overall level of satisfaction with respect to the e-service rendered by EFDA via i-register.

Level of Customers Satisfaction

	Strongly dissatisfied	Dissatisfied	Neutral	Satisfied	Strongly Satisfied
Overall, how satisfied are you with the e-services provided by EFDA via i-register.	1	2	3	4	5

Thank you for participating in this Survey.

Google form link: https://forms.gle/3wzAo9MuekTyBPK66