ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF MASTERS OF BUSINESS ADMINISTRATION

THE QUALITY OF E-GOVERNMENT SERVICE AND ITS ROLE IN ACHIEVING CUSTOMER SATISFACTION: THE CASE OF ETHIOPIAN FOOD AND DRUG AUTHORITY

BY

BINIAM TADELE

A THESIS SUBMITTED TO ST. MARY'S UNIVERSITY, SCHOOL OF GRADUATE STUDIES, FOR THE PARTIAL FULFILMENT OF THE REQUIREMENTS FOR MASTERS OF BUSINESS ADMINISTRATION (MBA)

July, 2020

Addis Ababa, Ethiopia

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DECLARATION

I, the undersigned, declare that this thesis is my genuine and original work; prepared under the guidance of Asres Abitie (PhD). All sources of materials used for this thesis have been duly acknowledged. I further confirm has not been submitted either in part or in full to any other higher learning institution for any academic purposes.

Name: Biniam Tadele

Signature:

Date of Submission:

Place: Addis Ababa

ENDORSEMENT

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

_____   _____

Advisor   Signature

St. Mary's University   Addis Ababa June 2020

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List of Acronyms

ICT: Information and Communication Technology

EFDA: Ethiopian Food and Drug Authority

eRIS: electronic regulatory information system

SPSS: Statistical Package for Social Sciences software

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Abstract

Over the past few years there has been a heightened emphasis on service quality and customer satisfaction in business and academia alike. It is apparent, there existence of strong relationships between service quality and customer satisfaction. E-government services are no exception. Recently the Ethiopian Food and Drug Authority launched Electronic regulatory information system (eRIS), in a hope to increase efficiency, transparency and facilitate information traceability. The aim of this study is to analyze the impact of the quality of e-government services dimensions including: Efficiency, Trust, Reliability and Support that are provided by the Ethiopian Food and Drug Authority in achieving customer satisfaction. To achieve the objectives of the study, data were collected through a Google Forms online questionnaire that was developed and distributed to an appropriate sample of beneficiaries of the e-services provided by the Ethiopian Food and Drug Authority. The sample of this study is made up of 168 participants and a systematic random sampling technique is used. Pearson's Correlation coefficients and Multiple Linear Regression are used to determine the relationship between the independent variables and the perceived overall satisfaction. The statistical analysis reveals that there exists a statistically significant positive relationship between all the e-government service quality dimensions and customers' satisfaction of Ethiopian Food and Drug Authority. The Reliability dimension was found to have the highest impact on customer satisfaction. Practical implication of the current investigations suggests improving the service quality which can progress customer's satisfaction. The findings of this study provide valuable information to administrative authorities of e-government development regarding electronic regulatory information systems, as well as for future researchers and projects in the domain of e-services.

Keywords

Electronic Regulatory Information System, E-government service Efficiency, Trust, Reliability, Support, Customer Satisfaction, Ethiopian Food and Drug Authority

CHAPTER 1

INTRODUCTION

In this chapter an overview of the entire study was presented. It includes the background of the study, statement of the problem, objective of the study, research questions, significance of the study, scope and limitation of the study and organization of the study.

1.1 Background of the Study

The world has witnessed a growing interest in electronic services provided by governments in the past few years. This is due to the need and inevitability for the modern development in the field of information and communication technology (ICT). The influence of ICT and its adoption in the governmental sector had a great impact on the various aspects of how citizens and businesses interact with different governmental services, resulting in new types of services being introduced, namely e-services and the development of e-government (Lemieux, 2016; Andersen et al., 2010; Palanisamy, 2004).

E-government services have received interest all over the world (Almarabeh & AbuAli, 2010) because it paves the way for a government to exercise its functions in an efficient and effective manner, hence transform its relations with citizens, businesses or other arms of government (Ezz, 2005).

The Ministry of Communications and Information Technology of the Ethiopian government launched 49 e-service portals worth 3.8 Million ETB in order to enable seven governmental institutions to give online services. The e-service portal is designed to provide a common platform and generic tools for online transactional services. Using the system, government organizations render electronic public services to citizens, non-citizens, businesses, and governmental and non-governmental organizations.

The Ethiopian Food and Drug Authority (EFDA) is one of the institutions that have benefited from the above ICT initiative. The EFDA has recently launched an online service portal, electronic regulatory information system (eRIS), in a hope to increase efficiency, transparency and facilitate information traceability. The software has three subsystems that work together

namely i-License, that allow entities to apply for certificate of competency, registration and import of products, i-Register that manage the market authorization where an applicant seeks to register medical product in Ethiopia for later import; and i-Import, which manage the import process for medical products once registered in Ethiopia. Pharmaceutical importers and wholesalers are the main beneficiaries (customers) of this e-service.

This sort of e-government services provides a wide range of benefits especially so in developing countries, where the public agencies face resource constraints in improving their operations and delivering services to the citizens and businesses. In such cases, e-government service has been considered as a means to save costs while at the same time improving quality, response times and access to services (UN-ECOSOC, 2003; Zoysa & Letch, 2013). It is also seen as a tool to increase transparency in administration and reduce corruption (Kumar & Best, 2006; Bhuiyan, 2011).

However, failure of e-government projects, especially in developing countries, is one of the well addressed topics in literature (Dada, 2006; Kumar & Best, 2006; Zoysa, et al., 2013). Heeks (2003) identified that most implementations of e-government in developing countries fail, with 35% being classified as total failures (e-government was not implemented or was implemented but immediately abandoned), and 50% are partial failures (major goals are not attained and/or there were undesirable outcomes).

On the other hand, in a study by Heeks & Stanforth (2007), it was estimated that over US $3 trillion was spent on ICT projects by governments during the ten year between 2000 and 2010 with an overall estimated failure rate of 60%. This is a disturbing fact, especially as developing countries have limited resources at their disposal, and cannot afford to waste large amounts of money in such projects.

Despite the high failure rate, e-government initiatives still receive huge investment (Liu, Zhou & Chen, 2008) and thus their long-term success is of paramount importance, especially for developing countries which are facing challenges such as limited budget and donor dependence (Hanna & Qiang 2005; Dzhusupova, Janowski & Estevez, 2011).

While many governments have invested heavily in e-government projects in the last decade, relatively little is known about the return value of these investments from the public value

perspective. Thus, government administrators need external and objective feedback on their e-government efforts and effects (Huang, 2007) to have a better understanding of the benefits and return on their investments. Therefore, the public value of e-government services should be considered and understood in particular to help decision makers when implementing new policies or initiatives. Wimmer (2008, p. 6), recommends assessing the value of government ICT investments as an important research area, arguing that the potential benefits of e-government initiatives can no longer be assumed, but must be demonstrated. He argues that 'a clear understanding of the value of e-government, and value for whom, is needed'. Furthermore, Maxwell (2005, p. 37) stressed that: 'The value of a government's investment in ICT should be assessed from the point of view of the public it serves.'

Providing citizens with high quality services is one of the main sources of public value (Kelly, Mulgan and Muers, 2002: O'Flynn, 2007). Thus, it's essential to evaluate the quality of e-government service to ensure that their performance is at the expected level. Joo, So, and Kim, (2018) stated that customers' satisfaction is the strongest determinant of successful implementation of e-government services. In the case of low performance, customers will be disappointed or even discontent, but on the other hand, if the expected performance meets real performance, the customers will be satisfied and happy. According to Mensah, Vera, and Mi (2018) developing an online service platform plays a major role in achieving customer satisfaction and is useful to gain fast services, which is also important in assessing the quality of electronic services.

Hence, the importance of this study is presented through providing information to decision makers in the EFDA about the customers' satisfaction on the e-services provided by EFDA. Moreover, the study discusses a new topic that the local body of knowledge shows a lack of according to the researcher's knowledge. It is expected that the true result of this study will benefit the decision makers of EFDA in developing and improving their e-services. This study examined the impact of quality of electronic services on achieving the satisfaction of the customers.

1.2 Statement of the problem

In general, the e-government services aim at transforming the service delivery and to make it more convenient and easier for both the citizens and businesses to create an effective means of interaction between the two sides (Srivastava & Teo, 2007). However, Allahawiah and Alsaraireh (2014) reported that many users of e-government services revert back towards the traditional ways of acquiring information such as personal visits and telephone enquiries after the initial trial of e-government services despite its various advantages.

Heeks (2003) also pointed out there is a low success rate for e-government projects in developing countries with only 15 percent success rate. This figure verifies that even with the increasing importance of providing a wide range of e-government services, the evaluation of the quality of such online services still needs more attention especially in the developing countries (Lee &Lin, 2011).

Service quality in the e-government domain has an impact on both government and citizens and it is defined as "users' overall assessment of quality in the virtual context and serves as one of the key factors in determining success or failure of e-government″ (Bhattacharya, Gulla and Gupta, 2010:249). Roger (1995) also indicates that discontinuance of the innovation may occur even after its adoption if the system does not meet the user's needs, regardless of prior success. Thus, in order to eliminate discontinuance, user-satisfaction is regarded as one of the salient factors.

Sureshchandar (2003) identified that strong relationships exist between service quality and customer satisfaction while emphasizing that these two are conceptually distinct constructs from the customers' point of view. Spreng and Mackoy (1996) also showed that service quality leads to customer satisfaction while working on the model developed by Oliver (1997). Likewise, e-service quality is positively related to satisfaction. The higher the e-service quality is perceived by users, the more satisfied users are with the e-service (DeLone and McLean, 2003). In addition, it has been shown that the success of any service delivery would largely depend upon its perception in the users' minds (Richard & Allaway, 1993), which would sequentially determine the users' loyalty and retention.

According to the proclamation 661/2009, the EFDA is mandated to execute the regulatory activities as per the council of minister's regulation 189/2010 (FDRE, 2010). EFDA plays a vital role in ensuring safety, efficacy and quality of health and health-related products and services. There is a compelling need for effective implementation of regulatory tools. Some primary data sources reveal that poor-quality pharmaceutical products are in the market because of inefficiencies in pharmaceutical regulatory functions in Ethiopia (FDRE, 2009). The use of these poor-quality medicines may also threaten the health and lives of patients (Ratanwijitrasin and Wondemagegnehu, 2002). WHO estimates that from one million deaths that occur from malaria annually, 200,000 would be avoidable if the medicines available were effective, of good quality and used correctly. Moreover, inefficiencies in medicines regulatory systems can delay entry of needed medicines in a market; hence, a barrier to access for users and to the profits and growth of the pharmaceutical business (Gray, 2004).

As part of the regulatory service provided, the EFDA recently launched electronic regulatory information system (eRIS) in order to streamline internal processes and increase the efficiency of transactions and transparency of communications with customers (Pharmaceutical Importers and Wholesalers). Since EFDA plays a crucial role in ensuring the health and wellbeing of citizens the success of this new e-service endeavor comes second to none.

As any e-service the success of eRIS will significantly rely on its capability in meeting users' needs and expectations. In the same notion the e-service quality perceived by users will determine overall user satisfaction, which is a requisite for a successful adoption of the information system (Gable, Sedera and Chan, 2003).

In this study an attempt has been made to study the factors influencing e-government service quality provided by EFDA and the effect of e-government service quality on customer satisfaction.

Studies on e-government service in Ethiopia are very limited and those that are available focus mainly on implementation, challenges and opportunities of e-government (Ayele, 2018; Kitaw, 2006; Mekuriya, 2009; Belachew, 2010; Haile, 2013). In addition, much of the existing research tends to pay more attention towards citizens rather than business (Cohen, 2006; Lessa &Tsegaye, 2019; Santap & Ashenafi, 2019). Studying the quality of e-government services from many

perspectives is regarded important for identifying any existing gaps between what is expected and actual. These perspectives include the business and citizens. Business perspective refers to the firms' employees who undertake e-government transactions on the behalf of their own firms. However; citizen's perspective refers to the individuals who use e-government transactions for personal purposes. This study assesses the quality of e-government service from business perspective, by surveying employees of pharmaceutical import and wholesalers who interact with eRIS of EFDA.

1.3 Research Questions

- Are the customers satisfied with the e-government service quality they get from EFDA?

- Is there any relationship among e-government service quality dimensions and customer satisfaction?

- What is the dominant e-government service quality dimension that has a strong impact on customer satisfaction?

1.4 Objectives of the Study

General Research Objective

- The general objective of this study is to assess the impact of e-government service quality dimensions of eRIS on achieving customer satisfaction.

Specific Research Objectives

- To measure the overall level of customer satisfaction with the quality of e-government service of eRIS.

- To examine the relationship between e-government service quality dimensions of eRIS and overall customer satisfaction.

- To identify the e-government service quality dimensions of eRIS that has a significant effect on customer satisfaction.

1.5 Significance of the Study

This research will have a great deal of importance for the decision makers of EFDA because it provides information about the quality level of e-service the institution is providing to its customers from the point of view of the customers. In addition, one of the major reasons to provide such e-government services for customers is gaining their satisfaction and trust. In this study, we want to explore the perceived overall satisfaction with e-government services and identify some relevant satisfaction factors. Correspondingly, it is expected that the true result of this study will benefit the decision makers of EFDA in developing and improving its electronic services.

Moreover, the study discusses a new topic that the current body of knowledge shows a lack of according to the researcher's knowledge. Accordingly, this research will serve as a springboard for other researchers to undertake further investigation.

1.6 Scope and Delimitations of the Study

The scope of this study covers one service among all e-government services offered in Ethiopia. This e-service is Electronic Regulatory Information System (eRIS). Since this study considers only one specific e-service, it should not be generalized to other e-government services.

This study only focuses on pharmaceutical wholesalers and importers in Ethiopia, who are the majority of customers of the e-service provided by EFDA. As a result, the finding of the study cannot be generalized to other customers of EFDA.

The purpose of this study was limited to assessment of the impact of e-government service quality dimensions on achieving customer satisfaction. The study focuses on e-government quality assessment at customer's overall satisfaction layer which addresses the overall level of quality perceived by the user against user's expectations. E-government service quality in process, technical and site performance layer are not focus of this study.

The sample population selected for this study was limited to pharmaceutical importers and wholesalers that currently use the e-government service offered by EFDA. The sample however is similar in nature to the rest of population that currently doesn't use the EFDA e-government service site and can thus be generalized.

There is no universally accepted e-government service quality assessment model. For the purpose of this study E-GovQual; e-government quality assessment model was employed to measure the quality of e-service offered by EFDA. This model contains four main dimensions; Efficiency, Reliability, Trust and Support. However, there exist several quality assessment models having different sets of dimensions.

1.7 Organization of the Study

The study is organized into five major chapters. The first chapter is an introductory part composed of Background of the Study, Statement of the Problem, Objective of the Study, Research Questions, Significance of the study, Scope and Limitation of the Study. The second chapter deals with Review of Related Literature. The third chapter focuses on the Research Methodology. The fourth chapter deals with Data Analysis and Discussion and in the fifth chapter covers Summary of Findings, Conclusions and Recommendations.

1.8 Definition of Terms

E-government service: the government services and transactions provided by the various governmental departments through the internet and application of ICT for the beneficiaries from citizens, business, and other government departments.

E-government service quality: is the extent to which a government website facilitates efficient and effective delivery of services.

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.

CHAPTER 2

REVIEW OF RELATED LITERATURE

The chapter is intended to present the theoretical and empirical foundation for the research topic.

Synopsis

Online service or e-service is a broad concept that includes services provided by organizations, companies, or an individual via an internet connection. If the government provides the services, then it is called e-government. If companies provide the services, then the services are referred to as e-business or e-commerce. If the services are offered by a bank, that is an example of e-banking. Buckley J. (2003) contends that the definitions of e-service proposed in various studies are clearly based on private sector experience and that the term e-government should be used in the public sector instead.

2.1 E-government and E-government Service

The concept of e-government originated around two decades ago and was popularized in the late 1990s. Nowadays, e-government is no longer a new concept, not even in developing countries, where e-government evolution is also occurring. There are many definitions of e-government from many different scholars, organizations, and countries; some of these definition highlights from individuals, organizations, and private sector entities are listed below:

According to the United Nations (2012a:233), *"E-government is utilizing the Internet and the world-wide-web for delivering government information and services to citizens."* In other words, e-government is based on the internet environment and the transfer of governmental services to citizens and businesses using the internet.

According to World Bank (2012:40), *"E-government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of government services to citizens, improved interactions with business and industry, citizen empowerment through access to information, or more efficient government management. The resulting benefits can be*

less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions."

The widely used definition of the term e-government is what was stated by Gartner (2000, adapted from Cascadis, 2007). According to this view, the term e-government represents the constant transformation of the internal and external relationships relating to the public sector through the following: internet-enabled operations, the information and the communication technology so as to optimize the service delivery, the population participation and public governance.

In the same temperament, Jeong (2007:14) defined the term e-government as follows: "The proper utilization of ICTs, as well as other web-based telecommunication technologies in the quest of improving and/or enhancing the effectiveness and efficiency of the delivery of services within the public sector". Others, such as Holden, Norris & Fletcher (2003) on the other hand, defined the term e-government as: the electronic delivery of the governmental services mainly by using Web technologies.

The definition e-government varies from different organizations and scholars but the idea is the same overall – using ICT to improve the delivery of government (public) services to the users, businesses and other government agencies. As a synonym to e-government the term government e-service, e-public service or e-government service can be used.

For clarifying the purpose of this study, it is apparent from the stated definitions regarding e-government that they address the field of e-government services. It can be concluded that the definition of the e-government concept has been broadened to include many other aspects.

In consistent with the purposes of this study, the following definition of E-government is adopted: the government services and transactions provided by the various governmental departments through the internet and application of ICT for the beneficiaries from citizens, business, and other government departments.

2.2 E-government Service Maturity Levels

E-government services follow different development stages with increasing sophistication: i) "push services" where information and data are made available to users; ii) "pull services" where information and data can be downloaded by users; iii) interactive services (e.g. electronic forms); iv) transactional services (e.g. full electronic case handling); and v) individualization of services (e.g. automatic individualized information and data provision) (OECD, 2009).

Both the United Nations and the European Union use a stage model. The United Nations describes "stages of e-government evolution" (Stage I: emerging; Stage II: enhanced; Stage III: interactive; Stage IV: transactional; and Stage V: connected) in its Web Measure Index (United Nations, 2012b). The European Union focuses on "sophistication of online services" - Level 1: information; Level 2: one-way interaction (e.g. downloadable forms); Level 3: two-way interaction (e.g. electronic forms); Level 4: transaction (e.g. full electronic case handling); Level 5: targetisation (e.g. automated, proactive services) (see Figure 2.1) (Capgemini, 2010).
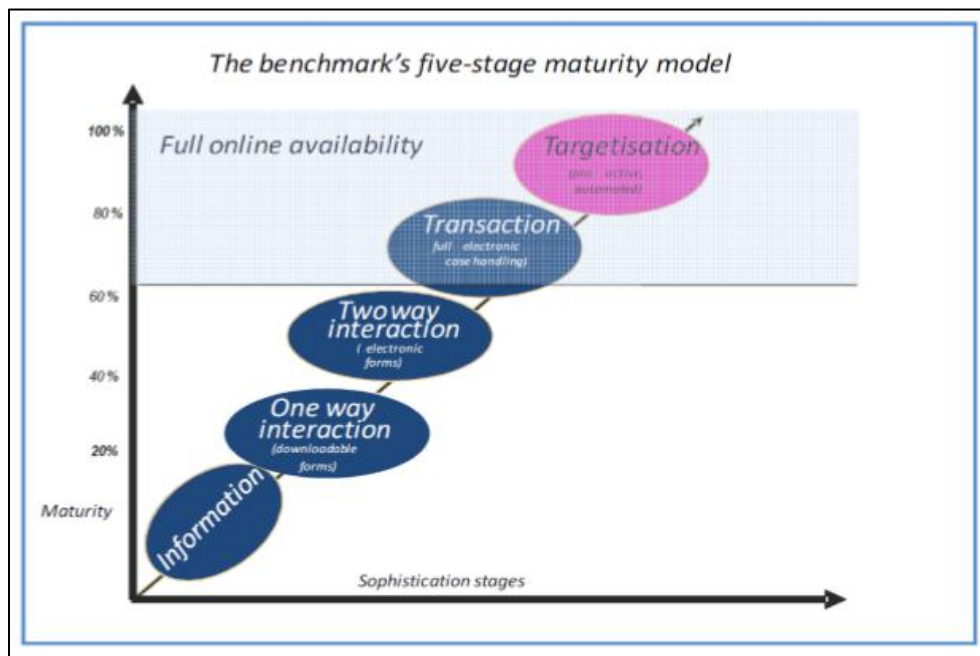
Figure 2.1.EU benchmark's five-stage maturity model taken from Capgemini, (2010)

2.3 E-government Service Classification

E-government services are classified into different categories: citizens, businesses, government and employees. These categories are abbreviated respectively into G2C, G2B which presents the interaction of government with external users, and G2E, G2G which concerns internal purposes (Backus, 2001).

2.3.1 Government to Business (G2B)

Fang (2002) clarified that this type of transactions includes different services and information which are exchanged between the government that is the public sector and the business community that is the private sector. These services include the following: to obtain the existing business information, to download any application forms, to renew expired licenses, to register new businesses, to obtain permits and taxes payments. Moreover, they would also include: the distribution of memos, policies, rules and regulations to the entire business community (Davies, 2007). The G2B application is mostly beneficial to the improvement of the quality and efficiency of communications and transactions between the business and the government (Metaxiotis & Psarras, 2004).

Heeks (2006) argues that the government's interactions with business are far more important than those it has with citizens in terms of the overall rate of economic growth in the country. This could also prove crucial especially in developing countries that need to attract foreign investors and facilitate the cumbersome procedures. Furthermore, issues of transparency and elimination of corruption can be assisted via this type of transaction.

The type of e-government service offered by EFDA through eRIS is categorized under G2B where pharmaceutical importers and wholesalers seek transactional service by utilizing the i-Import, i-Register and i-License portals.

2.3.2 Government to Citizens (G2C)

This dimension provides information and services to citizens. The most important purpose of these applications is to offer people different options and communications channels for public transactions (Al Shihi, 2006). In this regard, G2C applications offer services that are citizen-centric. According to a published report by the Organization of Economic Co-operation and Development (OECD, 2003), some examples of the G2C applications would include information

dissemination to the public, basic citizen services, such as: license renewals, ordering of birth, death, or marriage certificates and filing of income tax returns, as well as assistance for such basic services as education, health care, hospital information, libraries and the like (OECD, 2003).

However, as it has been discussed earlier since the role of e-government is seen to be beyond just provide basic information and services online, it is important to refer as well to the political dimension in the G2C application in which e-government enhances the relationship between citizens and government by having a say through participation online and electronic voting (Davies 2007).

2.3.3 Government to Government (G2G)

This interaction is regarded as the backbone of e-government, and identifies the internal processes and data sharing among government sector organizations (Bonham et al, 2001). The critical objectives of G2G applications are to reduce the associated costs, improve strategic decision-making and decentralize the power among all levels of government (Heeks, 2006).

G2G applications also provide coherent and interconnected government organization; thus, emphasizing the concept of integrated services. Moreover, G2G applications allow government agencies and departments to share information, databases, resources, capabilities and skills, thus increasing the effectiveness and efficiency of procedures (Ndou, 2004). This actually occurs as governments are allowed to communicate more effectively by reducing duplication and redundancy of information and communication (Evans & Yen, 2005).

2.3.4 Government to Employees (G2E)

The G2E attributes refer to the relationship between the government and its employees. G2E is also an effective way to bring employees together and to promote knowledge sharing among them (Ndou, 2004). G2E also refers to the strategic systems utilized to support the implementation of government objectives, human resource management and budgeting (Riley, 2001). The services and data supplied by the government agencies to employees and the ways in which employees cooperate with the management level are enabled by G2E services (Chavan & Rathod, 2009). A significant innovation of this feature is the integration of employees and back office systems and processes.

2.4 Service Quality

Traditionally, service quality has been conceptualized as the difference between customer expectations regarding a service to be received and perceptions of the service being received (Grönroos, 2001; Parasuraman, Zeithaml, & Berry, 1988). In some earlier studies, service quality has been referred to as the extent to which a service meets customers' needs or expectations (Lewis & Mitchell, 1990; Dotchin & Oakland, 1994). It is also conceptualized as the consumer's overall impression of the relative inferiority or superiority of the services (Zeithaml, Berry, & Parasuraman, 1990).

Parasuraman, Zeithaml, and Berry (1985) undertook an exploratory study to investigate the concept of service quality. It was revealed that judgment of high and low service quality depended on how customers perceived the actual performance in the context of what they expected. In short, service quality as perceived by the customers could be defined as the extent of the discrepancy between customers' expectations and their perceptions.

2.4.1 E-service Quality and E-government Service Quality

E-service quality [Parasuraman, (2002); Santos, (2003)] and e-government service quality (Buckley, 2003; Halaris, Magoutas, Papadomichelaki and Mentzas, 2007) has been studied by scholars in many cases. There are two definitions emerging: e-service quality and e-government service quality (Halaris etal., 2007). E-service quality definitions are more e-business oriented and e-government service quality is emphasizing e-government.

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 is proposed by Santos J. (2003:22) "the consumers' overall evaluation and judgment of the excellence and quality of e-service offerings in the virtual marketplace". E service quality focuses on the quality of the service delivered through the front office website (also portal) (Halaris, etal., 2007).

E-government service quality is defined as users' overall assessment of quality in the virtual context and serves as one of the key factors in determining success or failure of e-government (Bhattacharya, Gulla & Gupta, 2012). E-government service quality focuses on front-office website (also portal) and on overall user satisfaction (Halaris, etal., 2007).

The e-government service quality definition can be combined with e-service quality definition as the extent to which a government website facilitates efficient and effective delivery of services. The simplest way to define quality in the context of e-government is that quality is the extent to which user needs are fulfilled when consuming services through electronic channels.

2.5 Assessment of E-government Service Quality

Maintaining the quality of e-service is becoming principal for providing satisfactory services to the users. Service quality in the e-government domain has an impact on both government and users and it is defined as "users' overall assessment of quality in the virtual context and serves as one of the key factors in determining success or failure of e-government" (Bhattacharya, Gulla and Gupta, 2010:249).

The e-government service measurement is needed to achieve more efficiency in the functioning of government and to improve the delivery of government services. The European Commission, Information Society's annual e-government benchmark study is measuring public sector performance and the maturity of e-government services (Capgemini, 2011). For the state's organizations, the quality measurement during developing and after implementation gives an opportunity to assess, if the developed e-service meets the requirements of users (Lehtimäki, Alho, Vainio & Huhta, 2012).

Halaris C. et al. (2006) has identified four layers of quality assessment categories:

1. Back office process performance layer, addressing factors mainly found in quality models for traditional government services;
2. Site technical performance layer, addressing the factors of the technical performance of the site, i.e. site reliability, security etc.;
3. Site quality layer, addressing the factors of the site usability, and interface;
4. Customers' overall satisfaction addressing the overall level of quality perceived by the user against user's expectations.

E-government service quality in process, technical and site performance can be measured as a self-assessment in the organization before, during and after e-services' development (Bertot, Jaeger & McClure, 2008). For the purpose of this study customers' overall satisfaction layer of quality assessment was employed.

2.5.1 E-government Service Quality Assessment Model

A SERVQUAL model presented in the mid-1980s is considered as the benchmark for researchers investigating e-service quality dimensions and ways to evaluate service quality. SERVQUAL is a well-known model that represents ten service quality dimensions for measurement of quality: responsiveness, competence, access, courtesy, communicating, creditability, security, understanding/ knowing the customer and tangible (Parsuraman & Berry, 1985). In an attempt to solve the problem of the overlapping of the 10 dimensions the SERVQUAL model was revised and simplified into five key dimensions which are reliability, assurance, tangibles, empathy, and responsiveness.

For measuring e-service quality various researchers proposed various dimensions in different domains and contexts of applications. Lee and Lin (2005) proposed an e-service quality approach by modifying the SERVQUAL model. They developed the model to examine how e-service quality dimensions affect overall service quality, customer satisfaction, and purchase intentions in the context of online shopping. The dimensions of e-service quality included website design, reliability, responsiveness, trust and personalization.

Santos (2003) proposed a model called the e-service quality model, in which he mentioned that service quality is the key determinant for successful e-commerce, and that e-service quality has incubative and active dimensions for increasing hit rates, stickiness and customer retention. In this model, He indicated that the incubative dimension consists of content, structure and layout, linkage, appearance, and ease of use. The active dimension includes incentive, security, communication, support, efficiency and reliability.

SITEQUAL was proposed to measure the perceived quality of the internet shopping site (Webb & Webb, 2004). Wolfinbarger and Gilly (2003) in the United States presented a model ETAILQ for online retailing by identifying four key quality dimensions' website design, fulfillment/reliability, privacy/security and customer services.

E-S-QUAL was proposed by Parasuraman, Zeithaml and Malhotra in 2005 with the purpose of identifying dimensions for assessing e-service quality. When developing this approach, they divided the process into two stages. The basic E-S-QUAL is based on twenty-two items in four broader dimensions: efficiency, fulfillment, system availability, and privacy. The second scale they called E-RecS-QUAL which contained eleven items in three broader dimensions:

responsiveness, compensation, and contact. By applying this approach, Parasuraman et al. sought to introduce a method to improve e-service quality (Parasuraman et al., 2005).

2.5.2 E-GovQual

E-GovQual is a multiple-item scale e-government service quality model for measuring e-government service quality of government sites, where users seek either information or service (Papadomichelaki, & Mentzas, 2011). The model is based on classical theories and the model is proposed under the framework of SERVQUAL model which posits four dimensions influential to e-government site quality – efficiency, trust, reliability and support. E-GovQual is a very helpful model for measuring users' perceived service quality based on the analysis of e-government service sites or portals. All dimensions of E-GovQual are significantly impactful for service quality.

Papadomichelaki mentioned in another research study in 2006 that there are only two main approaches for the evaluation of e-government service quality. The first is the ―introvert approach, when the quality of service is analyzed and evaluated from within the organization. He also stated that service quality is influenced by many aspects, such as back-office procedures, organizational leadership, and management 's dedication to quality. The second approach is focused on the quality of the actual service being delivered, which he called the ―extrovert approach. This approach relates directly to the delivered service, such as usability, reliability, trust, content, or support of the service (Papadomichelaki, 2006). This study adopts an extrovert approach to assess the quality of e-service provided by EFDA through user surveys.

The E-GovQual quality assessment models were adopted in the current study for practical assessment of the quality of e-government service provided by EFDA. The first reason is these model fits the domain and context of this study. Secondly, its user-centric e-government quality assessment model aimed at measuring perceived e-service quality. This is essential as the current study focuses on evaluating e-government service quality from the customer perspective. E-GovQual is more consistent with the purposes of the current study as well as it includes more comprehensive factors compared with the E-S-QUAL, which focuses mainly on the quality of website quality whereby commercial services are provided rather than governmental ones.

The E-GovQual proposed by Papadomichelaki, and Mentzas(2011) has four quality assessment areas (dimensions): Efficiency, Trust , Reliability and Support.

Efficiency

Efficiency of e-government service can be seen as ease of use, which is defined as how easy the e-service is for customers to interact with. Gefen, Karahanna, & Straub (2003) and Santos (2003) also discussed the great importance of this dimension in improving the quality of e-service.

The use of set-up links with major search engines and an easy-to-remember and concise URL can expedite users in finding the website on the worldwide web. Likewise, internal navigation can be greatly assisted by a consistent website structure, by including a site-map in the site that allows users to skip sessions that are of no interest or by customized search functions where beneficiaries are allowed to search within the site by transactions, by public agencies or by keywords. Zhang and Von Dran (2001) found out in their research that for the governmental domain, "easy to navigate" is the most important feature followed by "clear layout of info," "up-to-date info," "search tool," and "accuracy of info".

Moreover, personalization of information, how much and how easily the site can be tailored to individual customers' preferences (like communicating with users in language they can understand, offering choices of languages other than the official language of the country, or providing choices that aid people with disabilities to use the site) can improve the ease of use of a governmental site.

Finally, the ability of customization, so that the system recognizes the user and displays in the first page links that the user frequently uses or remembers the settings concerning the preferred language and display can aid customers who repeatedly use the website (Santos, 2003).

Trust (privacy/security)

Trust consists of privacy and security and is defined as the customer's confidence towards the website concerning freedom from risk of danger or doubt during the e-service process. Gefen et al, (2003) and Zhao & Zhao (2010) have already stressed the importance of trust as a critical aspect of e-service in their studies. Privacy comprises the protection of personal information, not sharing personal information with others, protecting anonymity, secure archiving of personal data, and providing informed consent. Finally, security is defined mainly as protecting users from the risk of fraud and financial loss from the use of their credit card or other financial information but also by ensuring that the whole transaction is carried out the way it was

supposed to be. Security can be enhanced by encrypting messages, by access control, by digital signatures and by having procedures for acquiring username and password.

Reliability

Reliability is defined as beneficiaries' confidence towards the e-government site concerning correct and on-time delivery of the service. The term comprises correct technical functioning (accessibility and availability) and accuracy of service promises. Accessibility is a broad term used to define the degree to which a system is usable by as many people as possible without alteration. Also, the capability of the system to be displayed and used independently of the web browser used enhances its accessibility. Availability refers to the degree to which a system suffers degradation or interruption in its service to users as a consequence of failures of one or more of its parts. It represents the probability that a service is available. The availability of a site can also be boosted by ensuring the 24/7 accessibility to it, and a high loading and transaction speed.

Support (interactivity)

Support refers to the help provided by the organization to assist customers in their quest of information or during their transactions. This help may consist of user-friendly guidelines, help pages, and Frequently Asked Questions on the site, as well as availability of multiple communication channels (phone, e-mail, message boards, etc.). For cases that the above are insufficient the existence of contact information, so that personal advice can be offered either through e-mail or through a traditional channel such as the telephone, fax or postal mail is required. Parasuraman et al. (1988) quality dimensions of service quality can be applied in cases of interaction between users and the organization's employees, such as prompt reply to customer inquiries, knowledge of the employees, courtesy of the employees, ability of employees to convey trust and confidence, and problem solving. Finally, the ability to track the progress and the status of a transaction is considered positiveZeithaml, Parasuraman, & Malhorta (2002) stated that the Support dimension applies only when users experience problems.

2.6 Customer Satisfaction

Bitner & Zeithaml (2003) stated that satisfaction is the customers' evaluation of a product or service in terms of whether that product or service has met their needs and expectations. Satisfaction is a feeling which results from a process of evaluating what has been received against what was expected (Armstrong & Kotler, 1996).

In general, satisfaction refers to an evaluative attitude towards some object or experience. Literature proposed that users of a website provide personal judgment of evaluation response. Accordingly, website user-satisfaction may be defined as "the attitude toward the website by a hands-on user of the organization's website" (Muylle, Moenaert & Despontin, 2004: p.545). According to the literature, there is an obvious consistency between use and user-satisfaction; positive experience with use will lead to greater user-satisfaction in a causal sense and "increased user satisfaction will lead to increased intention to use, and thus use" (DeLone & McLean, 2003:23). As a result, satisfaction is a behavior response to the sum of one's feelings or attitudes toward a variety of factors affecting that situation (Bailey and Pearson, 1983:531). Therefore, it is treated as an overall measure of success, rather than as a dimension of success (Gable, Sedera & Chan, 2003) and a subjective measure for the system, which can be defined as the extent to which customers believe that the service meets their needs (Liu, Zhou & Chen, 2010).

Roger (1995) indicates that discontinuance of the innovation may occur even after its adoption if the system does not meet the user's needs, regardless of prior success. Thus, in order to eliminate discontinuance, user-satisfaction is regarded as one of the salient factors. Oliver (1980) postulated that user satisfaction leads to continuance intention, whereas, dissatisfaction leads to discontinuation. In a similar notion Roger (1995) declared that there are two types of discontinuance: replacement and disenchantment. Replacement discontinuance, which is the decision to reject an idea in favor of a better one, while disenchantment discontinuance is the rejection of an innovation as a result of dissatisfaction with its performance (Wangpipatwong, Chutimaskul & Papasratorn, 2008).

E-government services quality focuses on the front office website or portal and on the overall satisfaction of users (Halaris etal., 2007). Degrees of satisfaction or dissatisfaction and perceptions are all important to understand for the many services - offering organizations, for

example, governments; citizens, businesses in order to determine to what extent the citizens and the businesses are truly experiencing the value of these services (Moorman, Blakely & Niehoff, 1998).

2.7 E-government Service Quality and Customer Satisfaction

Over the past few years there has been a heightened emphasis on service quality and customer satisfaction in business and academia alike. Sureshchandar (2003) identified that strong relationships exist between service quality and customer satisfaction while emphasizing that these two are conceptually distinct constructs from the customers' point of view. Spreng and Mackoy (1996) also showed that service quality leads to customer satisfaction while working on the model developed by Oliver (1997). Likewise, e-service quality is positively related to satisfaction. The higher the e-service quality is perceived by users, the more satisfied users are with the e-service (DeLone & McLean, 2003).

Studies have proposed that the e-government service quality has a direct outcome for the users of e-government services user satisfaction (Verdegem, 2009). Generally, customer satisfaction is known as an outcome of service quality, which means that it is related to the quality of the products or services provided to the customer in a positive manner. The level of customer satisfaction is also believed to be enhanced, along with an increased level of perceived quality of the product or service. The quality is the cause and the satisfaction is the effect. This cause-effect relationship between e-government service quality and user satisfaction has been indicated in research (Halaris etal, 2007; Osman, Anouze, Irani, Lee & Weerakkody, 2011).

2.8 Research Conceptual Framework

In current study four e-service quality dimensions were used as independent variables (Efficiency, Trust, Reliability and Support) to measure customer satisfaction in eRIS of EFDA. These service quality dimensions are adapted from E-GovQual, a multiple-item scale e-government service quality model for measuring e-government service quality of government sites (Papadomichelaki & Mentzas, 2011). Statistical model was employed to measure the significance, influence and relationship among independent variables (Efficiency, Trust, Reliability and Support) and dependent variables (customer satisfaction).

Based on the E-GovQual model, the below mentioned conceptual framework was adopted for this study.
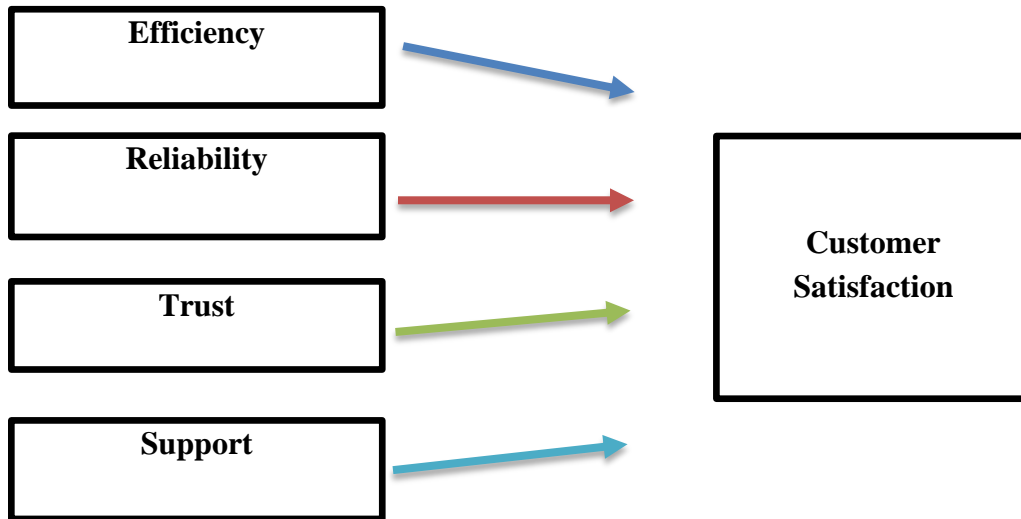
Figure 2.2: Conceptual framework of the study adopted from Papadomichelaki & Mentzas (2011)

Based on the conceptual framework research proposes the following hypotheses:

H1: Quality of e-government services of eRIS directly influences Customer Satisfaction.

H1a: Efficiency has a positive effect on Customer satisfaction.

H1b: Trust has a positive effect on Customer satisfaction.

H1c: Reliability has a positive effect on Customer satisfaction.

H1d: Support has a positive effect on Customer satisfaction.

CHAPTER 3

RESEARCH METHODOLOGY

The research was conducted using a quantitative method to analyze the relationship between the variables. This chapter discusses the research methodology; how data was collected, and the techniques and methods adopted to meet the aim of the study.

3.1 Research Approach

Research approaches are plans and the procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation (John, 2007). The selection of a research approach is also based on the nature of the research problem or issue being addressed, the researchers' personal experiences, and the audiences for the study. There are three basic approaches to research (a) qualitative (b) quantitative (c) mixed methods. As stated by Creswell (2003) quantitative survey is the most appropriate one to use if the purpose of an investigation is to describe the degree of relationship which exists between the variables. In general, quantitative research is the systematic and scientific investigation of quantitative properties and phenomena and relationships. The current study is categorized under quantitative research, which involves developing hypotheses based on theoretical statements and variables measured (Sekaran and Bougie, 2010). The quantitative approach symbolizes taking representative samples from "the population of interest and measures the behavior and characteristics of the chosen sample and attempts to construct generalizations regarding the population as a whole" (Wilson, 2010, p.14).

For the purpose this study quantitative research approach was employed to assess the impact of the quality e-government service dimensions that are provided by EFDA in achieving customer satisfaction. This approach generated data in quantitative form which were subjected to rigorous quantitative analysis in a formal and rigid fashion.

3.2 Research Design

There are three main types of research design, which can be classified according to the objective of the study: (1) Exploratory research; (2) Descriptive research; and (3) Explanatory (causal) research (Hair et al., 2003).

This research falls primarily under explanatory research, as this study explains and examines the effect of the quality of e-government service dimensions provided by EFDA on realizing customer satisfaction. Explanatory design seeks to determine how the independent variable influences the dependent variable after an event has occurred (Kothari, 2004). Despite the powerful concept of causality research, it is neither feasible nor practical to examine all variables that can lead to a phenomenon; therefore, the current study may be categorized under causal research. However, this decision should take into account that there may be other variables that are not incorporated in the model, which may explain higher correlations (Hair et al., 2003).

In addition, this study also has a descriptive aspect, which seeks to determine the answers to ′what′ and ′how′ research questions (Hair et al., 2003). Descriptive studies involve designing and collecting data; checking for errors; and coding and storing data. They also contain a structured questionnaire in which respondents select from a fixed number of choices.

Scholars have attempted to investigate the quality of E-government service and its role in achieving customer satisfaction. Consequently, the literature is rich with studies that address the issue under investigation; therefore, it cannot be categorized under exploratory research. Unlike exploratory researches, explanatory and descriptive researches are often confirmatory; in other words, they are used to test the prior formulation of specific hypotheses (Hair et al., 2003). It begins with defined structure and proceeds to actual data collection in order to examine the phenomenon under scrutiny (Malhotra & Varun, 1998).

The current research is a cross-sectional study that takes a snapshot of a situation in time (Hair et al., 2003). Accordingly, this research was conducted using both descriptive and explanatory research design and different inferential statistics tools were used to understand the relationship between the dimensions of e-government service quality dimensions and customer satisfaction.

3.3   Data Types and Source

There are two kinds of sources for data collection and these are primary and secondary sources of data. Primary data are those which are collected from the field by the researcher afresh and for the first time and thus happen to be original in the character (Kothari, 2004). Both primary and secondary data was collected from various sources using different instruments to make the study complete and achieve its predetermined objectives.

Primary and secondary sources were used in gathering information relevant to the subject under investigation. The researcher used a questionnaire to capture primary data regarding customers' perceived e-service quality and satisfaction. The researcher obtained secondary data from various sources of information from journals, books, publications and the internet that contain information that will help to build a case for the study. Secondary data was used to better articulate the problem at hand, define the gap in the work of previous scholars, aid in the process of hypothesis formulation/testing and questionnaire design.

3.4   Target Population

The EFDA e-service portal was launched in 2018, presenting its services to all pharmaceutical importers and wholesalers in Ethiopia. The e-service venture signified a basic change to the concept of presenting information and delivering services.

The population of this study consisted of pharmaceutical importers and wholesalers' employees who continuously interact with the e-service portal of EFDA. There are approximately 700 pharmaceutical importers and wholesalers in Ethiopia. The researcher listed down the targeted firms and inquired about the nature of their contact with the e-service portal of EFDA. The inquiry revealed at the formal level not all importers and wholesalers have started using EFDA e-service portal. Accordingly, it was estimated the number of pharmaceutical wholesalers and importers, which use EFDA's e-service portal in Ethiopia approximately amounted to 340.

3.5   Sampling Procedure

3.5.1 Sample Size Determination

Considering the size, as well as the time, it was hard to collect data on the whole population. Thus, to avert such constraints the researcher is forced to draw samples from the whole population. Whenever it is not possible to access the entire population, it is possible to collect data from samples and use the behavior within the sample to infer things about the behavior of the population. The size of the sample should neither be excessively large; nor too small. It should be optimum; an optimum sample is one which fulfills the requirements of efficiency; representativeness; reliability and flexibility (Kothari, 2004).

To simplify the process of determining the sample size for a finite population, Krejcie & Morgan (1970), came up with a table using sample size formula for finite population. For the purpose of this study, the population sample was determined on the basis of Krejcie Morgan table 1970.

The sample size representative of the customers (importers and wholesalers) of EFDA in this study was found to be 181. It was determined based on Krejcie and Morgan's (1970) sample size determination table. This is the same as using Krejcie and Morgan sample size calculation equation. The sample size determination (Table 3.1) is derivative from the sample size calculation equation which is expressed below (Krejcie &Morgan, 1970). Krejcie and Morgan's sample size calculation was based on p = 0.05 where the probability of committing type I error is less than 5 % or <0.05.

$n = X2 \ NP \ (1-P) \pm d2 \ (N—]) + X2 \ P \ (1—P)$

Where,

n = required sample size.

X= the table value of chi-square for 1 degree of freedom at the desired confidence level (0.05 = 3.841).

N = the population size.

P the population proportion (assumed to be 0.50 since this would provide the maximum sample size.

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

Table 3.1: Table for determining 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)

3.5.2 Sampling Techniques

Since collecting data from the entire population is an impossible task, obtaining a sample from the population was considered an appropriate approach for this study. The sampling method chosen for a study should be based on: (1) the nature of the study; (2) the objectives of the study; and (3) the time and budget available (Hair et al., 2003).

Probability sampling is the most representative sampling technique, and it is associated largely with survey-based studies (Saunders, Lewis and Thornhill, 2003). The objective of probability sampling is that the selection of elements should be based on random procedure, which gives elements a non-zero chance of being selected (Hair et al., 2003). The most commonly-utilized probability sampling techniques are: (1) simple random sampling; (2) stratified sampling; (3) cluster sampling; and (4) systematic sampling.

Conversely, non-probability (non-random), sometimes termed as 'judgmental sampling', technique provides a range of alternative techniques based on subjective judgment, which is chosen usually during the exploratory phases and during pretesting of survey questionnaires (Saunders, Lewis and Thornhill, 2003). The most frequently used non probability sampling techniques are: (1) convenience sampling; (2) judgment sampling; (3) quota sampling; and 4) snowball sampling.

For the purpose of this study systematic sampling was employed to achieve a suitable sample. The eRIS customer database was used to create a sampling frame of pharmaceutical importers and wholesalers. The sampling frame consisted of 340 pharmaceutical importers and wholesalers who currently use the eRIS service portal. Out of which 181 customers were selected using systematic random sampling. For the purpose of pretesting survey questionnaires convenience sampling was employed.

3.6 Data Collection Technique

Empirical studies are associated usually with a survey approach and data is often obtained via questionnaire. This is characterized by a structured or systematic set of data collection from a sizable population (Maylor & Blackmon, 2005; Hair et al., 2003; Saunders, Lewis & Thornhill, 2003). The current study was conducted using Google Forms online self-administered questionnaires in which respondents answer the questions directly without the presence of the researcher (Maylor and Blackmon, 2005; Saunders, Lewis and Thornhill, 2003).

The general advantage of the questionnaire method is that; it allows collection of large amounts of data from a suitable population. Moreover, using the questionnaire has many advantages (Audeh & Abdul Rahman, 2013) that are conformed to the current study. These advantages are:

- Save money and time, these results in low cost.
- Achieve Quick data flow.
- Can be administered to large numbers of respondents
- Easy to control the appropriate time and place that suits the subjects.
- The closed questions provide simple data analysis.
- The questions can be answered and the answers can be listed down and coded easily.

Data from sample customers were obtained by asking them to fill out a questionnaire. Apart from the socio-demographic characteristics, they were asked to provide their opinions about a number of different satisfaction characteristics about e-government services in order to measure their overall satisfaction. The Google Forms questionnaire used in this study is shown in Appendix A. To help the respondents truly understand everything that was being asked, the questionnaire has been designed to be as easy and comprehensive as possible. It was written in English language.

The questionnaire has been designed to measure respondents' socio-demographic characteristics including age, gender, education level, work position and access to eRIS site, as well as the four factors including efficiency, trust, reliability and support.

The questionnaire consisted of 25 items and was divided into three sections: Section A; consisted of a list of questions intended to probe the demographic variables of the respondents (5 items). Section B contained questions aimed at gathering the respondents' perception of the quality of e-government services provided by EFDA which was adopted from Papadomichelaki & Mentzas (2011). This section includes items designed to measure the e-government service quality dimensions; efficiency, reliability, trust and support (19 items). Section C includes a question to capture the overall customer satisfaction toward the e-services provided by EFDA (1 item). Section B and C was measured using 5-point Likerts scales with anchors ranging from 'strongly disagree' to 'strongly agree', in which ′1′ equals the negative end and ′5′ the positive end of the scale for all components (Appendix a).

Considering the current COVID pandemic the questionnaire was designed using Google Forms platform and respondents were approached via email and using other electronic platforms such as SMS, WhatsApp and Telegram.

3.7   Pilot Testing

It is desirable to conduct a pilot test to test the questionnaire prior to data collection (Bryman & Bell, 2007; Churchill, 1995). The pilot study for the current study was administered to 15 respondents who are selected out of the original study sample. According to Churchill (1995), the purpose of the pilot test is: (1) to purify the questionnaire to avoid problems while respondents answering the questions; (2) to avoid problems in recording the data; and (3) to obtain some assessment of the questions' validity and reliability of the data.

Prior to the actual data collection, a pilot study was conducted to pilot test the Google Forms questionnaire for its appropriateness and reliability. It was held to determine the general procedures that may be followed in the actual data collection, to clarify the instructions provided in the instrument, to further improve the face validity and finally, to improve the reliability of the instrument. Necessary modifications were made based on the feedback obtained from the test.

The pilot test was carried out in April 2020 involving a sample of 15 respondents. In this pre-testing, the customers were not merely requested to respond to the content of the Google Forms questionnaire but they were also asked to give comments about the instrument. The aim was to identify any inappropriateness and ambiguity with regards to the items used. The participants were introduced to the objectives behind this data collection. They were encouraged to ask questions by email or phone while filling up the questionnaire. A short discussion was also held at the end of the session and this opportunity was taken to thank the participants in person. On average, the respondents took about 8 minutes to complete the questionnaire.

After all the questionnaires of this pilot study were returned, all ambiguities, mistakes and misinterpretations found were addressed and some of the terms were simplified to avoid confusion.

3.8   Validity and Reliability

In order to reduce the possibility of getting the answer wrong, attention needs to be paid to two particular aspects related to research design: reliability and validity (Saunders et al., 2003).

Validity

Instrument validation and reliability are regarded as primary procedures in empirical research (Straub, Boudreau and Gefen, 2004; Churchill, 1979). In this study validity assessment was approached by assessing content validity through the pilot study. Content validity, sometimes called face validity, is normally established deductively (Cronbach and Meehl, 1955). It refers to the "assessment of the correspondence of the variables to be included in a summated scale and its conceptual definition" (Hair et al., 2006: 136). Cronbach and Meehl (1955: 282) indicate that content validity is "established by showing that the test items are a sample of a universe in which the investigator is interested". Therefore, content validity depends on how well the items

generated cover the domain of the construct being measured (Nunnally and Bernstein, 1994). It is related to the accuracy of the measurement in order to provide confidence that item measures taken from a sample are representative of the true score in the population (Hair et al., 2006: 776).

Following Straub, Boudreau and Gefen (2004) advice, content validity was established in this study during the pilot study by reviewing the literature and the use of expert's judgment to ensure that test items are representative of the domain they are supposed to measure. The construct validity, convergent validity of the questionnaire was confirmed through exploratory factor analysis.

A number of different steps were taken to ensure the validity of the study:

- Data was collected from the reliable sources, from respondents who are more experienced in using online services;
- Survey questions were made based on literature review and frame of reference to ensure the validity of the result;
- Questionnaire has been pre-tested by a group of respondents before starting the survey.
- Data has been collected during two weeks, within this short period of time no major event has changed with the related topic.

Reliability test

Before proceeding with further analysis, the reliability testing was conducted in order to ensure consistent measurement across various items in the questionnaire. Reliability measures the degree to which a set of indicators of a latent construct is consistent internally in their measurements (Hair et al., 2010). There are two frequently used indicators of a scale's reliability: test-retest reliability (temporal stability) and internal consistency (Pallant, 2010). The test-retest reliability is assessed by administering it to the same people on two different occasions, and calculating the correlation between the two scores obtained. However, Churchill (1979:69) does not support the use of the test-retest reliability scale due to "respondents' memories". The author argues that respondents end up replying to an item in the same way they did in the first administration. In contrast, the internal consistency reliability scale assesses the degree to which the items that make up the scale all measure the same underlying attribute. The most commonly-

used measure of internal consistency is by conducting Cronbach's coefficient (α) alpha reliability test.

Reliability estimate that is 0.70 or higher suggests good reliability, whereas reliability between 0.60 and 0.70 may be acceptable provided that other indicators of a model's construct validity are good. Nevertheless, the lowest acceptable limit for Cronbach's coefficient (α) is .0.70 (Churchill, 1979). For the current study internal consistency was employed to test the reliability of the construct. As shown in Table 3.2, SPSS version 23 was used during pilot testing to generate Cronbach's coefficient (α) value for the construct.

Table 3.2: Reliability Statistics of the Questionnaire

Reliability Statistics	
Cronbach's Alpha	N of Items
.896	20

Source: SPSS output (pilot survey data, 2020)

In the pilot study of 15 respondents, a Cronbach's Alpha value of 0.896 for the 20 items (19 items measuring e-government service quality dimensions and 1 item measuring customers' overall satisfaction) was achieved, indicating good consistency and stability of the instrument. The results of the reliability tests are highlighted in Table 3.2. These results of the pilot study were, therefore, considered satisfactory, and so a full-scale data collection and the subsequent analyses were conducted with the adapted survey.

3.9 Ethical Considerations

When conducting a primary research in an academic setting, ethical consideration must be addressed. Moreover, it is preferable to integrate ethics into the research process in the early stages to ensure that the process is guided by ethical principles from beginning to end (Hesse-Biber & Leavy, 2006).

Thus, before distributing the questionnaire, the researcher was acquainted with the ethical guidelines of St. Mary's university. As a result, the current study was conducted according to the St. Mary's University research ethics guideline.

The participants were chosen mainly to benefit the research under the assumption of having used e-government services previously, 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 voluntarily and free from any coercion. The survey was designed, reviewed and undertaken to ensure integrity, quality and transparency. The questionnaire included a cover letter describing the purpose of the research along with a brief introduction to the topic of the study and how the results can aim in improving e-government service provided by EFDA. In addition, the contact details (name and email address) of the researcher was included in the cover letter in case respondents have any ethical concerns.

3.10 Data Collection

The data for the present study were collected through the structured online Google Forms questionnaire. The first step taken towards collecting data was getting permission to conduct the study. To collect the data formal emails were sent to participants involved, detailing the purpose of the study and ensuring confidentiality of participation.

3.11 Data analysis Techniques

After the collection of the required data, the researcher code and enter data into a computer for electronic processing using the SPSS version 23. The Data analysis include descriptive statistics to count the frequency of response, reliability analysis-to test the internal consistency of the instrument, correlation analysis-to assess the relationship between variables of the study and multiple regression analysis-to assess the extent of influence of independent variables (e-government service quality dimensions) on dependent variables (customer satisfaction).

CHAPTER 4

RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents the findings of the study based on the analysis of the data collected through our Google Forms questionnaire. First, the socio-demographic profile of the respondents (customers using eRIS) will be discussed. Second, the results of descriptive statistical analysis for independent variables and dependent variables will be discussed. Last, the relationship between the independent variables and the dependent variable will be closely examined.

4.2. Data Analysis

Out of 340 customers of the EFDA eRIS service 181 were chosen as the sample of this study, the sample recommended by Krejcie and Morgan (1970). After reviewing the collected Google Forms questionnaire data, it was found that 170 responses out of 181 were recorded on the Google Forms report database, of which 168 were valid and could be used as the final sample of the study after data cleaning by removing incomplete responses. Hence, the valid return rate was 92.8 %. 168 responses were entered into a computer and then analyzed with SPSS version 23.

Descriptive statistics (frequencies, percentages, means, and standard deviations) were used as a means to describing socio-demographic characteristics of the respondents, as well as their perceptions towards independent and dependent variables. Pearson's Correlation coefficient was used to determine the relationship between each of the independent variables and overall perceived satisfaction factors such as Efficiency, Trust, Reliability and Support. Finally, multiple linear regression was employed to examine the impact of each e-government service quality dimension on customer satisfaction.

4.3. Descriptive Summary of Socio-Demographic characteristics

The socio-demographic characteristics of the sampled customers in this study are based on five variables. These variables are age, gender, education level, work position and access to the eRIS site.

Table 4.1: Socio-Demographic description of survey respondents (Age and Gender)

		Frequency	Percentage (%) (n=168)
Gender	Male	142	84.5
	Female	26	15.5
Age	21-30	42	25
	31-40	86	51.2
	41-50	30	17.9
	51-60	6	3.6
	>60	4	2.4

Source: SPSS output (survey data, 2020)

Table 4.1 presents the distribution of the 168 customers who participated in this study by age and gender. From the total 168 responses submitted 26 respondents were Female, and 142 respondents were Male. Furthermore, as it can be seen, 25% of them were between the age of 21 and 30 and 51.2% were between 31and 40 which was the largest age group. Citizens whose age ranged from 41 to 50 years old, 51 to 60 years old and above 60 years old accounted for 17.9%, 3.6%, and 2.4% of the sample respectively. This result reveals that the majority of the customers were below 40 years old (76.2%). This result suggests that citizens using eRIS site of EFDA are relatively young.

Table 4.2: Socio-Demographic description of survey respondents (Educational level, Work position and Access to eRIS)

		Frequency	Percentage (%) (n=168)
Education	Diploma	8	4.8
	Bachelor's Degree	112	66.7
	Masters and above	48	28.6
Work Position	Technical Manager	68	40.5
	Registration Officer	18	10.7
	Registration Consultant	12	7.1
	Others	70	41.7
Access to eRIS	Multiple times a day	30	17.9
	Once a day	16	9.5
	A few times a week	56	33.3
	A few times a month	36	21.4
	Less than once a month	24	14.3
	Not at all	6	3.6

Source: SPSS output (Survey data, 2020)

Table 4.2 presents the distribution of respondents by educational level, work position and access to the eRIS site. It can be seen that the majority of customers hold a Bachelor's Degree constituting 66.7% of the sample. Another 4.8% had a diploma and the remaining 28.6% had Masters and above. As a result, it can be noted that those holding a Bachelors'' degree will have a great influence on this study. The respondents had different work position backgrounds. Most of the respondents (41.7%) related to the category of "others" when it comes to work position. Technical Manager Position holds the next highest work position category (40.5%) followed by registration officer and registration consultant, which account to 10.7% and 7.1% of respondents, respectively. The last question showed that one third of the respondents (33.3%) visit the eRIS site a few times a week. In addition, those respondents who responded "Not at all" on the last demographic question regarding access to eRIS account for only 3.6% of the total sample. This indicates data was collected from the reliable sources, from respondents who are more experienced in using online services.

4.4. Reliability and Validity

The exploratory factor analysis (EFA) was used to measure the items strength and ability to predict and explain the e-government quality dimension construct (independent variables) studied in the current analysis. SPSS statistics was used to perform this task to examine validity of the items and its ability to predict determinants. In EFA the convergent validity is based on three indicators; 1), the construct reliability of each item (factor loading), 2) the reliability of every measure (CR), 3) the average variance extracted (AVE). All items of constructs have convergent validity when the combined reliability increased the standard of 0.7 and value of average variance extracted (AVE) is higher than 0.05 (Hair et al., 2006).

Table 4.3: Exploratory factor analysis of independent variable measurement scale items

Construct	Items	Loadings	CR Cronbach Alpha value	AVE	Kaiser-Meyer-Olkin Values (KMO)	Bartlett's Test of Sphericity	
						Approx.Chi-Square	Sig.
Efficiency	EF1	0.833	0.880	0.655	0.822	352.702	.000

	EF2	0..787					
	EF3	0.821					
	EF4	0.796					
Trust	TR1	0.756	0.863	0.619	0.828	306.987	.000
	TR2	0.786					
	TR3	0.824					
	TR4	0.780					
Reliability	RL1	0.817	0.921	0.652	0.905	702.588	.000
	RL2	0.810					
	RL3	0.845					
	RL4	0.822					
	RL5	0.826					
	RL6	0.719					
Support	SP1	0.835	0.885	0.662	0.790	372.889	.000
	SP2	0.830					
	SP3	0.800					
	SP4	0.788					

Source: SPSS output (survey data, 2020)

Table 4.3 summarized that the factor loadings, the composite reliability (CR) and the average variance extracted (AVE) (Appendix b). All constructs loadings were higher than 0.7 and all AVEs values were greater than 0.5 (specifically ranged between 0.619 - 0.662) as shown in the

table above. Similarly, all CR values (ranged between 0.863 - 0.921) observed higher than 0.7 as shown in Table 4.3. Consequently, the convergent validity of the measures is strongly supported by analysis result (Hair et al., 2006).Moreover, all Alpha values were found to be greater than 0.7, showing good reliability (Nunnally & Bernstein, 1994).The KMO measure of sampling adequacy was above the recommended cutoff value of 0.7 for constructs of e-government quality dimensions while the Bartlett's test of sphericity was significant ($p = 0.000$) indicating the data is suitable for factor analysis (Hair et al., 2010).

The customer satisfaction measurement scale is adapted from Cronin and Taylor (1992). A five-point Likert scale ranging from "1 –strongly dissatisfied" to "5 - strongly satisfied" has been used to measure the customer overall satisfaction with the eRIS service. The internal consistency method will not be applied due to single item instruments. The overall reliability of the entire instrument (20 item questionnaire) was tested through Cronbach's Alpha, where its value ranges from 0.0 to 1.0 (Nunnally & Bernstein, 1994). A value closer to 1.0 indicates strong reliability of the instrument, eventually suggesting consistency and stability of the questionnaire. As shown in Table 4.4, the instrument resulted in a considerably high Cronbach's Alpha of 0.934.

Table 4.4: Reliability Statistics of Questionnaire

Reliability Statistics		N
Cronbach's Alpha	N of Items	168
.934	20	

Source: SPSS output (survey data, 2020)

4.5 Respondents' view of e-government service quality dimensions: Efficiency, Trust, Reliability, and Support

4.5.1 Respondents' view of Efficiency

The possible scores for efficiency might range from 1 to 5. These scores were divided into three levels. Scores within 2.34 to 3.669 were considered moderate, while scores lesser than 2.339 were categorized as low and greater than 3.67 were considered high.

This decomposition was based on class interval width. It is the difference between the lower endpoint of an interval and the lower endpoint of the next interval according to the formula (4.1) below (Gravetter & Wallnau, 2007).

Class Interval (CI) Width = HSV − LSV/K   (4.1)

Where:

HSV = Highest Scale Value;

LSV = Lowest Scale Value;

K = Number of categories;

Class Interval Width (CI) Width= (5 − 1)/3= (4)/3 = 1.33.

Hence, 1-2.339=Low; 2.34-3.669=Moderate; and 3.67-5=High.

Table 4.5presents the distribution of the customers with respect to their general view towards efficiency.

Table 4.5: Distribution of respondents with respect to their general view towards Efficiency of the eRIS service

Level	Frequency	Percentage (%)	Mean	SD
Low (1-2.33)	19	11.3	3.38	0.81
Moderate (2.34-3.66)	82	48.8		
High (3.67- 5)	67	39.9		

Source: SPSS output (survey data, 2020)

As shown in Table 4.5 close to half of the customers in the sample (48.8%) perceived efficiency as Moderate. The mean score was 3.38, suggesting that they perceived efficiency of eRIS service as Moderate. For this study the efficiency dimension of e-government service quality was assessed using four items. The percentage distribution of Customers by degree of agreement on those four statements concerning efficiency was computed for a more detailed analysis as shown in Table 4.6.

Table 4.6: Distribution of respondents by degree of agreement on items concerning Efficiency of the eRIS service

Customers' view of the Efficiency of the eRIS service (n=168)	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
The eRIS site is easy to use	1.2	12.5	32.7	39.3	14.3	3.53
The eRIS site map is well organized and	0.6	14.3	38.1	33.3	13.7	3.45

easy to follow					
The eRIS site is customized to individual users' need	0.6	14.9	32.7	41.7	10.1	3.46
The eRIS site provide up to date information	4.2	29.2	32.1	22.6	11.9	3.09

Source: SPSS output (survey data, 2020)

The obtained results clearly show that ease of use (item1) is relatively the highest rated (M=3.53) aspect related to the Efficiency of eRIS service, while freshness or providing up to date information (item 4) scored the list (M=3.09). The remaining statements regarding the organization (item2) and customization (item 3) of eRIS site were rated with a mean score of 3.45 and 3.46, respectively. These findings indicate the most essential aspect linked to the efficiency of eRIS service is, its ease of use.

4.5.2 Respondents' view of Trust

Table 4.7 presents the distribution of customers with respect to their view towards Trust of the eRIS service. The majority of customers in the sample (53.6%) perceived trust as high. The mean score is 3.74, suggesting that they perceived the trust aspect of eRIS service as high.

Table 4.7: Distribution of respondents with respect to their view towards Trust of eRIS service

Level	Frequency	Percentage (%)	Mean	SD
Low (1-2.33)	5	3	3.74	0.71
Moderate (2.34-3.66)	73	43.5		
High (3.67- 5)	90	53.6		

Source: SPSS (survey data, 2020)

In the current study the Trust dimension of e-government service quality was measured through a multiple item scale comprising four items. The distribution of customer's response regarding the Trust construct is presented in Table 4.8 below.

Table 4.8: Distribution of respondents by degree of agreement on items concerning Trust of the eRIS service

Customers' view of the Trust of the eRIS service (n=168)	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
Acquisition of user name and password for eRIS site is secure	0	1.8	14.9	53	30.4	4.12
Only the necessary data are provided for authentication on the eRIS site	0.6	7.1	31.5	45.8	14.9	3.67
Data provided by users on the eRIS site are archived securely	1.2	6	36.9	40.5	15.5	3.63
Data provided by users on the eRIS site are used only for the reason submitted	0.6	14.3	31.5	36.9	16.7	3.55

Source: SPSS (survey data, 2020)

The obtained results obviously show that all items related to Trust toward the eRIS service scored above mean average, suggesting customers are satisfied with most of the items under

Trust. In particular, regarding Trust secure acquisition of password and username (item 1) was found to be the most significant aspect of eRIS (M=4.12).

4.5.3 Respondents' view of Reliability

Table 4.9 presents the distribution of customers with respect to their view towards reliability of eRIS service. The majority of customers in the sample (48.8%) perceived reliability as moderate. The mean score is 2.93, suggesting that they perceived reliability of eRIS service as moderate.

Table 4.9: Distribution of Respondents with respect to their view towards Reliability of eRIS service

Level	Frequency	Percentage (%)	Mean	SD
Low (1-2.33)	49	29.2	2.93	0.83
Moderate (2.34-3.66)	82	48.8		
High (3.67- 5)	37	22		

Source: SPSS (survey data, 2020)

For the purpose of this study, respondents were presented with six questions aimed at evaluating the Reliability dimension of e-government service quality. Table 4.10 presents the percentage distribution of customers by degree of agreement on six statements concerning Reliability of the eRIS service.

Table 4.10: Distribution of Respondents by Degree of Agreement on items concerning Reliability of the eRIS service

Customers' view of the Reliability of the eRIS service (n=168)	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
Forms on the eRIS site are downloaded and uploaded in a short time	19	30.4	28	17.9	4.8	2.59
The eRIS site is available and accessible whenever you need it	7.1	26.2	32.1	29.8	4.8	2.99
The eRIS site performs the service successfully upon first request	15.5	35.7	28.6	16.7	3.6	2.57
The eRIS site provides service in time	3	20.8	42.9	26.2	7.1	3.14
The eRIS site pages are downloaded quickly enough	1.8	21.4	44	29.2	3.6	3.11
The eRIS site work properly with your default browser	3	16.7	45.8	26.2	8.3	3.20

Source: SPSS (survey data, 2020)

According to the obtained results, the list rated aspects related to the Reliability of the eRIS service constitute successful task completion upon first request (item 3) and the speed forms on the eRIS site are downloaded and uploaded (item 1). Both item 1 and item 3 scored below mean average, (M=2.59) and (M=2.57) respectively. The remaining items 2, 4, 5 & 6 scored average with the highest percentage of respondents having a neutral response toward reliability of the eRIS service.

4.5.4 Respondents' view of Support

Table 4.11 presents the distribution of customers with respect to their view towards Support of eRIS service provided by EFDA employees. The majority of customers in the sample (45.8%) perceived support as moderate. The remaining 39.9% and 14.3% perceived support as high and low respectively. The mean score is 3.31, suggesting that they perceived support of eRIS service as moderate.

Table 4.11: Distribution of Respondents with respect to their view towards Support of eRIS service

Level	Frequency	Percentage (%)	Mean	SD
Low (1-2.33)	24	14.3	3.31	0.85
Moderate (2.34-3.66)	77	45.8		
High (3.67- 5)	67	39.9		

Source: SPSS (survey data, 2020)

Table 4.12 presents the percentage distribution of customers by degree of agreement on four statements concerning support.

Table 4.12: Distribution of Respondents by Degree of Agreement on items concerning support of the eRIS service

Customers' view of the Support of the eRIS service (n=168)	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean
Employees (EFDA) show a sincere interest in solving users' problem	4.8	26.2	26.2	35.1	7.7	3.15
Employees give prompt replies to users inquires	4.8	18.5	36.9	31.5	8.3	3.2
Employees have the knowledge to answer users inquires	3	13.1	32.1	41.1	10.7	3.43
Employees have the ability to convey trust and confidence	3	12.5	33.3	37.5	13.7	3.46

Source: SPSS (survey data, 2020)

The findings noticeably demonstrate that item 3 and item 4 linked to the support aspect of the eRIS service scored above mean average. This was demonstrated by half of respondents having 'Agree' and 'strongly agree' responses on knowledge of employees (item 3) and their ability to convey trust and confidence. Item 1 was relatively rated on the list with 26.2% and 4.8% of the respondents correspondingly, responding "disagree" and "strongly disagree" with employees' sincere interest in solving user inquiries.

In summary, the majority of customers in the sample (48.8%) perceived Efficiency as moderate while (53.6%) perceived Trust as high. In the same manner, the majority of customers in the sample (48.8%) perceived Reliability as moderate. Finally, (45.8%) perceived Support as moderate.

4.6 Statistical analysis of customer overall satisfaction

The Overall satisfaction of customers was assessed using a single item scale measurement. Respondents were asked to rate their satisfaction on 5-point Likert scale. Table 4.13 presents the distribution of customers with respect to their overall satisfaction with eRIS service provided by EFDA.

Table 4.13: Distribution of respondents with respect to their overall satisfaction with eRIS

Level	Frequency	Percentage (%)	Mean	SD
Low (1-2.33)	36	21.4	3.14	0.96
Moderate (2.34-3.66)	67	39.9		
High (3.67- 5)	65	38.7		

Source: SPSS (survey data, 2020)

The result shows the majority of the customers' in the sample (39.9%) are moderately satisfied with the eRIS service. A bit shy to the above percentage of customers (38.7%) were found to be highly satisfied. The remaining 21.4% of customers in the sample rated their satisfaction as low. The mean score for respondents was 3.14, suggesting that the overall satisfaction of customers with eRIS service is moderate.

4.7 Summary of descriptive statistical analysis

Table 4.14: Summary of descriptive statistics

Descriptive Statistics

	N	Mean	Std. Deviation
EF	168	3.38	.819
TR	168	3.74	.711
RL	168	2.93	.836
SP	168	3.31	.856
Overall, how satisfied are you with the e-services provided by EFDA via eRIS	168	3.14	.962

Source: SPSS (survey data, 2020)

Table 4.14 indicate that customers of the eRIS site, provided by EFDA, perceived Trust (with the highest mean score i.e. M=3.74, SD=0.711) to be the most dominant e-government service quality dimension exhibited by eRIS and evident to a considerable extent, followed by Efficiency (M=3.38, SD=0.819), Support (M=3.31, SD=0.856) and Reliability (M=2.93, SD=0.836). With regards to customer satisfaction Table 4.14 indicates customers of eRIS site are moderately satisfied (M=3.14, SD=0.962).

4.8   Hypothesis Testing

The following two tests were done to test the research hypothesis:

- Pearson correlation analysis
- Regression analysis

In this analysis the four dimensions of e-government service quality were tested against overall customer satisfaction as the dependent variable.

H1a: Efficiency has a positive effect on Customer satisfaction.

H1b: Trust has a positive effect on Customer satisfaction.

H1c: Reliability has a positive effect on Customer satisfaction.

H1d: Support has a positive effect on Customer satisfaction.

4.8.1 Pearson's Correlation Analysis

To determine the relationship between e-government service quality dimensions (Efficiency, Trust, Reliability and Support) and customer satisfaction, Pearson's correlation was computed. The result of Pearson's correlation on the relationship between e-government service quality dimensions and customer satisfaction is indicated in Table 4.15.

The Pearson correlation coefficient (r) is a measure of the linear relationship between two variables. The value of correlation coefficient lies between -1 to 1. These signs are used particularly to determine the relationship between the variables. Positive values determine the strong positive relationship between the variables showing that with the increase in one variable there will be an increase in the value of the other variable and negative values shows the strong negative relationship between the variables meaning that if the value of one variable is increasing then the value of another variable must be decreasing.

Table 4.15: Pearson's Correlation Coefficients of the Independent Variables and the perceived Customer Satisfaction

	Efficiency	Trust	Reliability	Support	Customer Satisfaction
Efficiency	1				
Trust	.421[**]	1			
Reliability	.387[**]	.510[**]	1		
Support	.476[**]	.356[**]	.407[**]	1	
Customer Satisfaction	633[**]	.585[**]	.715[**]	665[**]	1
**. Correlation is significant at the 0.01 level (2-tailed). N=168					

Source: SPSS (survey data, 2020)

Correlation matrix is used in this study to show the strength of relationship among variables considered in the hypothesis. The correlation matrix in Table 4.15 further indicates that e-government service quality was positively and moderately correlated with customer satisfaction. The correlation coefficient between the independent variable (e-government service quality) and dependent variable (customer satisfaction) were less than 0.90, indicating that data was not affected by a collinearly problem (Hair, Anderson, Tatham and Black.,1998). This indicates that the constructs are distinct from one another and deemed to exhibit an acceptable level of discrimination. These correlations are also further evidence of validity and reliability of measurement scales used in this research (Barclay & Thompson, 1995; Hair et al., 1998).

According to the (Table 4.15), there is a significant positive relationship between the four dimensions of e-government service quality and customer satisfaction, the relatively the highest correlation is between reliability and customer satisfaction ($r=0.715$, $n=168$, $p<0.01$) followed by support ($r=0.665$, $n=168$, $p<0.01$), efficiency ($r=0.633$, $n=168$, $p<0.01$) and the remaining

dimension trust (r=0.585, n=168, p<0.01). Relatively the weakest correlation is between trust and customer satisfaction whereas; the strongest correlation is between reliability and customer satisfaction.

In other words, if correlation is positive between two or more variables, that is, when e-government service quality dimensions and customer satisfaction is positively related; delivering better e-government service quality ensures higher customer satisfaction. The findings displayed that the respondent who perceived a greater reliability of the e-government service quality practice exhibited the more positive reactions in favor of customer satisfaction. Accordingly, the most important service quality dimension that affects customer satisfaction is reliability (i.e. with highest scores of correlation), which goes to prove that reliability perceived as a dominant e-government service quality followed by support and efficiency; this indicates advances in reliable service, better customer support and improvement in efficiency of eRIS service have significant effect on level of customer satisfaction. Even if trust has relatively a lower correlation, improving this dimension has also an effect on customer satisfaction.

The review of the Pearson Correlation depicted in Table 4.15 shows that all the correlations of e-government service quality dimensions with customer satisfaction were significant at p <0.01. The predicted and hypothesized direction of relationships is also supported by the results. In this case, a statistically significant positive relationship of customer satisfaction with efficiency (0.633), trust (0.585), reliability (0.715) and support (0.665) support the hypotheses of this study.

4.8.2 Multiple Regression Analysis

Multiple regression analysis was employed to test the hypotheses. It is a useful technique that can be used to analyze the relationship between a single dependent variable and several independent variables (Hair et al., 1998). Before employing the multiple regression tests, Variance Inflationary Factor (VIF) test and Tolerance test were used to test the relationships between independent variables, taking into account that VIF should not exceed the value of 10 and Tolerance value should exceed the value of 0.05. The results can be seen in Table 4.18. The results shown in Table 4.18 indicate that VIF values for all variables were less than10 (between 1.411 and1.492), and values of Tolerance for all variables were greater than 0.05 (between 0.670

and 0.709). Therefore, there is no multicollinearity between independent variables, which means that the model used in this study is correct.

Based on this method, the four main independent variables (quality dimensions of e-government services) and dependent variable (customer satisfaction) were entered together. Histogram and Normal P-P plot of standardized residuals that were conducted also indicate normality of the error term while scatter plot shows consistent variance of error terms (Homoscedasticity). The partial regression plot indicates positive linearity of the relationship between the independent variables (quality of e-government services) and dependent variable (customer satisfaction) (Appendix c).

In addition, while conducting Multiple Linear Regression, when the number of cases is small relatively to the number of independent variables in the regression, the researcher risks finding significant beta coefficients just by chance (Garson, 2009). Fewer than five cases per independent variable are generally considered unacceptable, even for exploratory research. According to Tabachnick and Fidell (as cited in Garson, 2009), a rule of thumb for testing beta coefficients is to have n >= 104 + m, where m = number of independent variables. The number of independent variables or m is four for this study and sample size or n is 168. Therefore, there is no problem with the sample size for doing the Multi Regression Analysis to achieve the objectives of this study (Garson, 2009; Cohen, Cohen, West & Aiken, 2003).

From these analyses, it can be concluded that multiple regression models of this study meet the assumptions required to ensure validity of its significance test. This indicates that there is a statistically significant relationship between quality of e-government services and customer satisfaction.

Model summary analysis

Model summary part of output is very important in describing the standard error of estimate and goodness of fit (R square). This summary tells us how strongly the multiple independent variables are related to dependent variables. The table shown below gives us the representation of variation among dependent and independent variables.

Table 4.16: Model summary

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.871[a]	.758	.752	.479	.758	127.596	4	163	.000
a. Predictors: (Constant), SP, TR, EF, RL									

Source: SPSS (survey data, 2020)

The results have shown that 75.8% (R^2=0.758) variations in dependent variable i.e. customer satisfaction is caused by independent variables. It means that there exists a positive relationship between all independent variables and a dependent variable. The proposed model was adequate as the F statistic =127.596 were significant at the 1% level ($p < 0.01$). This indicates that the overall model was reasonably fit and there was a statistically significant association between service quality dimensions and customer satisfaction. Standard error of estimates tells us about the dispersion of actual values from the regression line. This model gives a standard error of estimate 0.479, meaning that actual data is only 47.9% dispersed from the regression line. Coefficient of each variable indicates that the change in dependent variable could be expected from the change in particular variable while keeping all the other variables constant.

ANOVA table analysis

ANOVA test is used to measure the significance level of study. In the above table sum of squares of regression represents the overall experimental effect (the effect of service quality dimensions on customer satisfaction) whereas the mean square of the model represents the average experimental effect. Whereas, sum of squares of residuals shows that there are some unsystematic errors within data due to some natural incidence. Of all the information given in ANOVA table the major concern of the researcher is to focus on the value of "Sig." column. This column indicates how likely it is that an F-value of that size would have occurred by chance; in this case the probability is 0.000 which shows that the chances occurrence is less than 0.1%. If the P-value given in this column is less than the critical value i.e. 0.01, set by researchers, then the effect is said to be more significant and the greater the value of P from critical value will give insignificant results.

Table 4.17: ANOVA analysis

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	117.156	4	29.289	127.596	.000[b]
	Residual	37.416	163	.230		
	Total	154.571	167			

a. Dependent Variable: Overall, how satisfied are you with the e-services provided by EFDA via eRIS

b. Predictors: (Constant), SP, TR, EF, RL

Source: SPSS (survey data, 2020)

Above Table 4.17 has shown that our P-value is much less than 0.01, meaning that there is a significant impact between the variables. So, we can say that there is a strong impact of efficiency, reliability, support and trust on customer satisfaction. The direction of relationship can be determined from the value of the sum of squares of regression which is 117.158 much larger as compared to the sum of squares of errors i.e. 37.416. It shows that there exists a positive relationship between the variables.

Regression model

$$Y=\beta_0+ \beta_1x_1+\beta_2x_2+\beta_3x_3+ \beta_4x_4 + \epsilon \qquad (4.2)$$

Customer satisfaction= -1.232 + 0.257(Efficiency) + 0.156(Trust) + 0.405(Reliability) + 0.322(Support) + ϵ (error)

Table 4.18 Regression Summary of E-government service quality to Customer Satisfaction (N=168)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-1.232	.220		-5.601	.000		
	EF	.301	.054	.257	5.534	.000	.690	1.450
	TR	.210	.063	.156	3.318	.001	.675	1.481
	RL	.466	.054	.405	8.612	.000	.670	1.492
	SP	.362	.051	.322	7.045	.000	.709	1.411
a. Dependent Variable: Overall, how satisfied are you with the e-services provided by EFDA via eRIS								

Source: SPSS (survey data, 2020)

The individual model variables revealed that Reliability (which got the highest effect ß = 0.405, t =8.612, p < 0.01) followed by Support (ß = 0.322, t =7.045, p < 0.01), Efficiency (ß = 0.257, t =5.534, p < 0.01) and Trust (which got the lowest effect ß = 0.156, t =3.318, p < 0.01) were found to have a significant and positive effect on customers' satisfaction.

The regression equation (4.2) shows the impact of one variable on another variable. It shows how the e-government service quality dimensions show their impact on customer satisfaction. From the regression table it is shown that if the value of independent variable i.e. Reliability is increased by 1 unit then there would be an increase in dependent variable i.e. customer satisfaction by 0.405 units. This shows that there is a positive impact of reliability on customer satisfaction, meaning that if the reliability of eRIS service increases 100% it would result in an increase in customer satisfaction by 40.5%. The results are highly significant because the P-value in the table is much less than the 0.01. Similarly, if the Support dimension is increased by 1 unit then there would be an increase in customer satisfaction by 0.322 units. Likewise, 1-unit increase in efficiency and trust would result in 0.257 unit and 0.156-unit increase in customer satisfaction, respectively. From the above regression Table (4.18) we can conclude the reliability dimension has the highest impact on customer satisfaction followed by support, efficiency and trust.

The review of the regression Table (4.18) clearly reveals that all the hypotheses are supported at P level of less than 0.01.H1c (Reliability has a positive effect on Customer satisfaction.) resulted with a stronger impact compared to the rest of hypotheses. In this case, the standardized coefficient beta was 0.405. Similarly, the weakest among the hypotheses was H1b (Trust has a positive effect on Customer satisfaction.) with standardized coefficient beta value of 0.156.

4.9 Discussion

Among all the e-government service dimensions, Trust has the highest mean (M=3.74) suggesting customers are pleased with the privacy and security offered by the EFDA. This was ensured by the EFDA with providing customers secured username and password. The Authority also provides guarantees to ensure the privacy and information security of the users. Regarding reliability as one of the e-government services quality, it was rated the least (M=2.93). Customers find the first time success rate of eRIS in conjunction with the speed of uploading and downloading forms to be unsatisfactory. This finding suggests the authority should emphasize on not only doing the service right but also doing it right the very first time.

In addition, customers of EFDA perceived the e-government service quality dimensions, Efficiency and Support as moderate with mean scores of M=3.38 and M=3.31, respectively. Detail analysis revealed customers were pleased with the ease of use of eRIS, while in contrast they were moderately satisfied with the ability of the site to provide up to date information. By the same token, the majority of respondents believe employees of the EFDA are knowledgeable and convey trust and confidence while dealing with customers.

The level of customers' satisfaction on the electronic services provided by EFDA via eRIS was moderate. The researcher considers this result supportive to the descriptive analysis resulting in the independent variable items in this study. The study sample participants present their satisfaction on the electronic services provided by EFDA. These services are characterized by efficiency, reliability, security and beneficiary sensation of the amount of help gained through using these services in accomplishing their transactions easily without the need to visit the institution to finish these transactions.

The study results showed a significant impact of the e-government services quality dimensions on the beneficiary's satisfaction of the electronic services provided by the EFDA via eRIS. This result came consistent with many of the previous studies made in different sectors and different countries, especially the study of Chang, Wang & Yang (2009), Hassan (2006) and Kayabsi & Buyukarslan (2013).

The study found that H1a is supported in this study with beta value of 0.257 for efficiency. The characteristics of efficiency; ease of use, website design and information availability were found

to have a significant impact on the beneficiaries' satisfaction of the electronic services provided by EFDA. It is concluded that the excellence of designing the website participated in meeting the beneficiary's demands. This result was shown in customers' level of satisfaction. Furthermore, this result coincides with the previous studies done by Kayabsi & Buyukarslan (2013) and Al-Mhamed (2012).

The significant impact of the trust dimension constituting privacy and security on the beneficiaries' satisfaction with electronic services provided by EFDA as a result of the high level of beneficiary's awareness of the security and privacy dimension was supported by this study. The result was consistent with many studies in different field such as Scheduler& Schmidt (2004), Al-Hnaite (2005), Abu-zaid (2006) and Hassan (2006).

H1c was supported in this research with a beta value of 0.405 for reliability against consumer satisfaction. Therefore, the empirical results of this research are strongly suggested by supporting studies (Ali et al, 2017: Al-Hawary, Al-Menhaly & Sulieman, 2017: Orgeron, & Goodman, 2011) The empirical findings of these previous studies have indicated that reliability play most important role in enhancing customer satisfaction in various online service industries in context of different countries. With regard to support, it has a significant impact on the beneficiaries of the electronic services provided by EFDA, this result indicates that the beneficiaries' satisfaction from the services provided by eRIS site will rely on the necessary support they receive from EFDA employees to finish their transaction in time. This result coincides with the results mentioned in the previous studies.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The aim of the study was to assess the effect of e-government service quality dimensions on customer satisfaction in the case of Ethiopian Food and Drug Authority (EFDA), particularly the electronic regulatory information system (eRIS). The theoretical related literature review showed that four e-government service quality dimensions have a significant impact on customer satisfaction.

The required data is obtained through an online self-administered structured questionnaire developed on Google Forms platform and the validity and reliability of the adopted instruments was carried out. The sample size is determined using Kreijcie and Morgan sample size table for known population and respondents are selected using systematic random sampling technique. The e-government service quality was measured using the four service quality dimensions (Efficiency, Trust, Reliability and Support) and the satisfaction level of respondents was measured using a five-point Likert scale. A total of 181 questionnaires were distributed to the sampled pharmaceutical importers and wholesalers, out of which 168 were returned and analyzed using SPSS V23.

In the analysis; descriptive statistics, correlation analysis and multiple linear regression analysis was performed. The result of the background information of the respondents indicated that the majority of the respondents were male (84.5%). With regards to age category, 51.2% and 25% of the respondents were between 31-40 and 21 -30 years respectively. Moreover, the majority were bachelor's degree holders (66.7%).

According to the findings of this study, customers of the eRIS site, provided by EFDA, perceived Trust (with the highest mean score i.e. M=3.74, SD=0.711) to be the most dominant e-government service quality dimension exhibited by eRIS and evident to a considerable extent, followed by Efficiency (M=3.38, SD=0.819), Support (M=3.31, SD=0.856) and Reliability (M=2.93, SD=0.836). With regards to customer satisfaction, customers of eRIS site are moderately satisfied (M=3.14, SD=0.962).

The correlation analysis result using Pearson correlation reveals that there is a significant positive relationship between the four dimensions of e-government service quality and customer satisfaction, relatively the highest correlation is between reliability and customer satisfaction (r=0.715, n=168, p<0.01) followed by support (r=0.665, n=168, p<0.01), efficiency (r=0.633, n=168, p<0.01) and the remaining dimension trust (r=0.585, n=168, p<0.01). Relatively the weakest correlation is between trust and customer satisfaction whereas; the strongest correlation is between reliability and customer satisfaction.

The regression analysis indicated that all e-government service quality dimensions are important predictors of customer satisfaction. The study showed that 75.8% variation on the customer satisfaction was explained by the four dimensions of e-government service quality. The result revealed that Reliability got the highest effect (ß = 0.405, t =8.612, p < 0.01) followed by Support (ß = 0.322, t =7.045, p < 0.01), Efficiency (ß = 0.257, t =5.534, p < 0.01) and Trust (ß = 0.156, t =3.318, p < 0.01) were found to have a significant and positive effect on customers' satisfaction.

5.2 Conclusion

According to literature review in chapter three above, the success of e-government service is directly linked to the satisfaction of the customers. Customer satisfaction, in turn, is determined by the quality of service offered. The current study was conducted to evaluate the quality of e-government service provided by Ethiopian Food and Drug Authority (EFDA) through its Electronic Regulatory Information System (eRIS) web portal and its impact on achieving customer satisfaction.

The findings of this study show the majority of the customers' in the sample (39.9%) are moderately satisfied with the eRIS service and 21.4% of customers in the sample rated their satisfaction as low. This finding shows there is still room for improvement of EFDA's eRIS service.

The perceptions of the customer are representative of what the customer values in service quality. These perceptions play a key role in determining the level of satisfaction the customer derives from the service they are offered by the service provider. EFDA should therefore strive to offer services that meet the specific needs of the customer. It is therefore very prudent to determine what these needs are in order to come up with value propositions geared towards satisfying these needs.

Wilson (2008:55) states that "*because customers compare their perceptions of performance with reference points when evaluating service quality, thorough knowledge about customer expectations is critical to services marketers*". The findings of this research have indeed brought out those expectations that the customer wants EFDA to understand and therefore to work on.

According to this study customers value Reliability over the other four e-government service quality dimensions. EFDA should therefore leverage on this dimension and make it a reference point for evaluating the quality of its eRIS service. On the other hand, all four dimensions are perceived to be very important in evaluating the quality of e-government service. EFDA should therefore ensure that they leverage on all four dimensions to ensure that when customers compare their perceptions of performance, they have key reference points to use in their evaluations.

Finally, the findings of the study showed that there is a positive and significant relationship between all of the four e-government service quality dimensions and customer satisfaction which means improvement in each dimension of the e-government service quality and delivering a high quality e-service will lead to a higher customer satisfaction.

5.3   Recommendation

In light of the study results, the researchers recommend the following:

Decision makers of EFDA should be aware that, among the various dimensions of e-government service quality, Reliability was especially significant in fostering satisfaction for the customers of eRIS site. It is apparent that focusing on delivering high quality reliable services and improves service quality effectively is critical for customer satisfaction.

- ▪ Task's completeness is very important for the customers, so devoting enough time to complete the task, and online help during the task should be enhanced. In addition, the connection speeds and bandwidth should be increased.

Improving the capabilities of the employees in solving the problems that arise while using eRIS to enhance the electronic services quality. It is important to respond to the needs and requirements of customers, and in addition, to answering the users' questions and enquiries as fast as possible.

Necessary information and helpful instructions regarding the tasks as well as making the service easier to navigate should be provided. Working on improving the website design will decrease the download time and also the pressure on the customers. Thus, they will reach the information in a smooth easy way.

Solving all criticism that is facing the electronic business especially the ones related to privacy and to the beneficiaries, this is done by ensuring the beneficiaries that the website is safe and has the programs needed to prohibit any eligible access. The information of the customers will be used only on the service requested by them.

Providing the electronic website with all technical support; either the audio or visual in Amharic or in English. In addition, having customer support built in the website will aid in improving customers experience.

Expanding the electronic services provided by the EFDA in order to integrate other services of the authority into the online platform; such as online payment.

5.4   Future Research and Limitations

This study was carried out to find the relation between e-government service quality dimensions and satisfactions from the customers' point of view. Future studies can be conducted to explore and include the providers' standpoint.

This study only selected several appropriate service quality dimensions as independent and dependent variables related to the issue which doesn't cover all dimensions of e-government service quality. Additionally, the future studies are suggested to expand the number of e-government service quality dimensions which could lead to improved validity and to predict customer satisfaction in various e-services domains.

The respondents of this research were pharmaceutical wholesalers and importers whereas future studies are advised to increase the sample size. Studies should focus on incorporating other customers of the eRIS site to enhance the level of validity and generalization.

Another limitation of this research is questionnaire language which was in English. Most of the respondents who are not familiar with the English might not thoroughly understand the given items in the survey instrument, which could enhance the confusions in the given questions that might affect reliability of the data set. Therefore, future studies are suggested to include local languages.

Finally, the methodology adopted in this work could serve as a basis for studying customers' satisfaction with other electronic services offered by the governments of Ethiopia and in other countries.

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Appendices

Appendix (a): Questionnaire

ST. MARY'S UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF MASTERS OF BUSINESS ADMINISTRATION

Dear respondents;

My name is BiniamTadele. The purpose of this study is for a partial fulfillment of the requirements for the Masters of Business Administration in St. Mary's University School of Graduate Studies. 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: 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 e-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 survey on the perception of the actual e-service provided by EFDA via eRIS and part three is on the overall customer satisfaction on the quality of e-service provided by EFDA.

The questions don't take you more than 5 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.

BiniamTadele: +251910542543

Email: biniamabeeelo@gmail.com

Part One: Background Information

Please make a tick mark **(X)** 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 eRIS.**

    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 eRIS. For each statement, please show the extent to which you believe eRIS has the feature described by the statement. There is no right or wrong answers. Circle any of the numbers that best shows your perceptions and feeling about eRIS.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
EF1	The eRIS site provided by EFDA is easy to use	1	2	3	4	5
EF2	The eRIS site map is well organized and easy to follow.	1	2	3	4	5

EF3	The eRIS site is customized to individual users' need.	1	2	3	4	5
EF4	The eRIS site provide up to date/fresh information.	1	2	3	4	5
T1	Acquisition of user name and password for eRIS site is secure,	1	2	3	4	5
T2	Only the necessary data are provided for authentication on the eRIS site.	1	2	3	4	5
T3	Data provided by users on the eRIS site are archived securely.	1	2	3	4	5
T4	Data provided by users on the eRIS site are used only for the reason submitted.	1	2	3	4	5
RL1	Forms on the eRIS site are downloaded and uploaded in short time.	1	2	3	4	5
RL2	The eRIS site is available and accessible whenever you need it.	1	2	3	4	5
RL3	The eRIS site performs the service successfully upon first request.	1	2	3	4	5
RL4	The eRIS site provides service in time.	1	2	3	4	5
RL5	The eRIS site pages are downloaded quickly enough.	1	2	3	4	5
RL6	The eRIS site works properly with your default browser.	1	2	3	4	5
S1	Employees (EFDA) showed a sincere interest in solving users' problem.	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 eRIS will be sought after. Please circle a number that shows yours overall level of satisfaction with respect to the e-service rendered by EFDA via eRIS.

Level of Customers Satisfaction

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

Thank you for participating in this Survey.

Google Forms sample email

Dear Sir/Madam,

Greetings!

I'm currently conducting a research entitled THE QUALITY OF E-GOVERNMENT SERVICE AND ITS ROLE IN ACHIEVING CUSTOMER SATISFACTION: THE CASE OF ETHIOPIAN FOOD AND DRUG AUTHORITY for a partial fulfillment of the requirements for the Masters of Business Administration in St. Mary's University School of Graduate Studies. In connection with this, I kindly request your participation in this brief survey.

Your participation in the survey is completely voluntary and all of your responses will be kept confidential.

Thank you very much for your time and cooperation.

Survey Link: https://docs.google.com/forms/d/e/1FAIpQLScQ7bNhksy4YF5bKraTCi092dLxeHBXFKTxT7OpWn ML5lugsA/viewform?usp=pp_url

Stay Safe!!!
BiniamTadele
+251910542543
Whats App, Telegram, Viber.

Appendix (b):

Appendix (b1): Factor Loading

Rotated Component Matrix[a]

	Component			
	1	2	3	4
The eRIS site is easy to use	.089	.148	.833	.081
The eRIS site map is well organized and easy to follow	.205	.265	.787	.173
The eRIS site is customized to individual users' need	.111	.158	.821	.194
The eRIS site provide up to date information	.200	.196	.796	.170
Acquisition of user name and password for eRIS site is secure	.156	.270	.133	.756
Only the necessary data are provided for authentication on the eRIS site	.184	.091	.164	.786
Data provided by users on the eRIS site are archived securely	.272	.091	.098	.824
Data provided by users on the eRIS site are used only for the reason submitted	.293	.032	.227	.780
Forms on the eRIS site are downloaded and uploaded in short time	.817	.139	.111	.214
The eRIS site is available and accessible whenever you need it	.810	.202	.075	.165
The eRIS site performs the service successfully upon first request	.845	.125	.189	.219
The eRIS site provides service in time	.822	.139	.143	.135
The eRIS site pages are downloaded quickly enough	.826	.047	.118	.167
The eRIS site works properly with your default browser	.719	.214	.126	.196
Employees (EFDA) showed a sincere interest in solving users' problem	.195	.835	.158	.011
Employees give prompt replies to users' inquiries	.180	.830	.218	.041
Employees have the knowledge to answer users' inquiries	.164	.800	.195	.170
Employees have the ability to convey trust and confidence	.121	.788	.184	.293

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Source: SPSS output (survey data, 2020)

Appendix (b2): Composite Reliability (CR),KMO and Bartlett's test of sphericity

Efficiency:

Reliability Statistics

Cronbach's Alpha	N of Items
.880	4

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.822
Bartlett's Test of Sphericity	Approx. Chi-Square	352.702
	Df	6
	Sig.	.000

Trust:

Reliability Statistics

Cronbach's Alpha	N of Items
.863	4

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.828
Bartlett's Test of Sphericity	Approx. Chi-Square	306.987
	Df	6
	Sig.	.000

Reliability:

Reliability Statistics

Cronbach's Alpha	N of Items
.921	6

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.905
Bartlett's Test of Sphericity	Approx. Chi-Square	702.588
	df	15
	Sig.	.000

Support:

Reliability Statistics

Cronbach's Alpha	N of Items
.885	4

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.790
Bartlett's Test of Sphericity	Approx. Chi-Square	372.889
	df	6
	Sig.	.000

Source: SPSS output (survey data, 2020)

Appendix (c): Multiple Linear Regression Assumptions
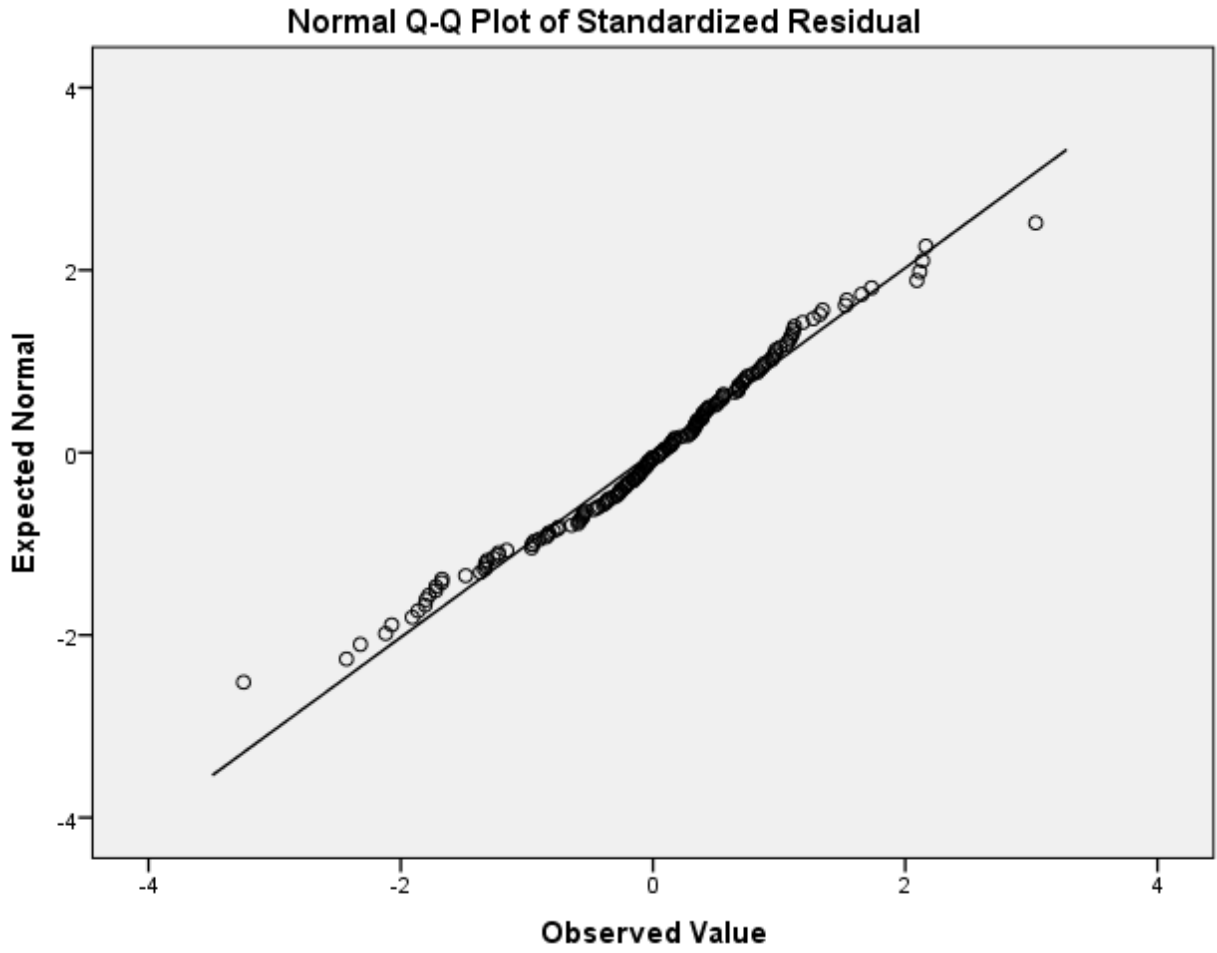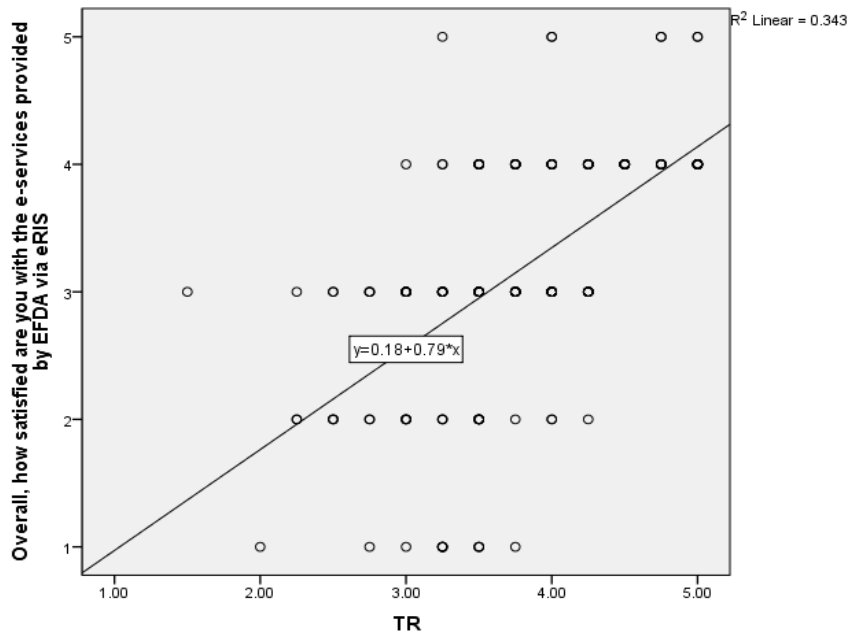
Appendix (c1): Normality of standardized residuals

Histogram

Dependent Variable: Overall, how satisfied are you with the e-services provided by EFDA via eRIS

Mean = 3.23E-16
Std. Dev. = 0.988
N = 168
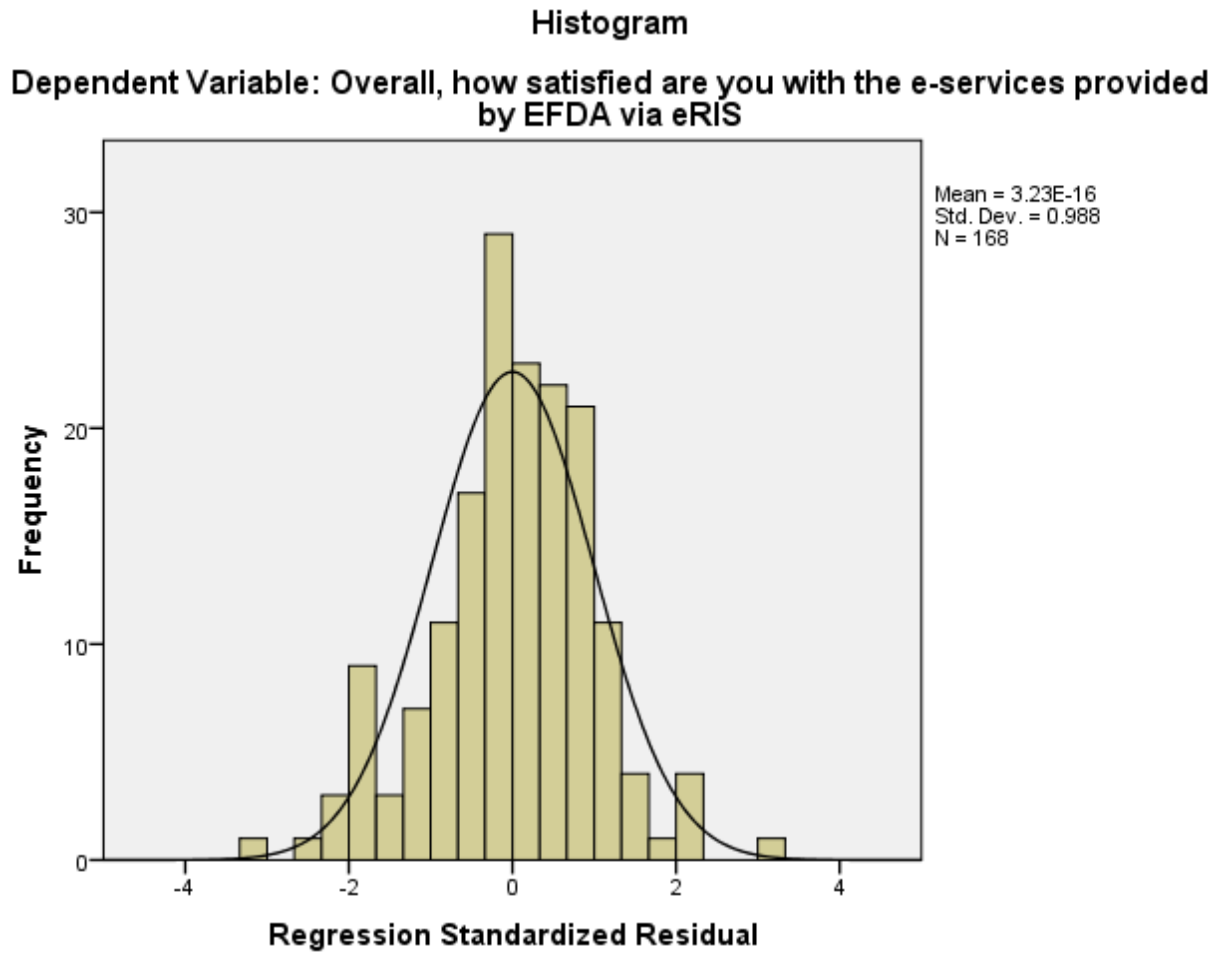
Source: SPSS output (survey data, 2020)
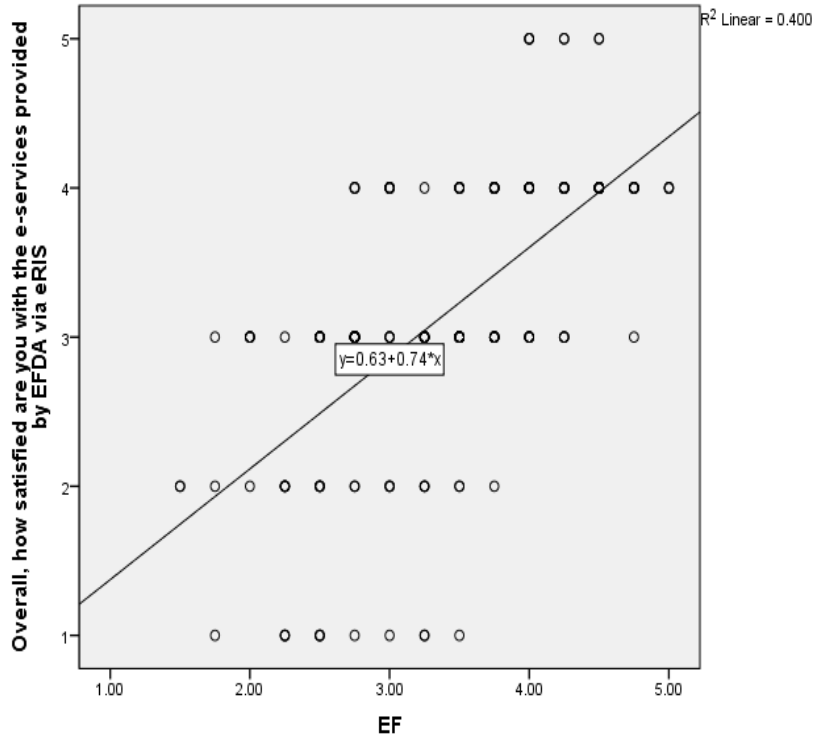
Normal P-P Plot of Regression Standardized Residual

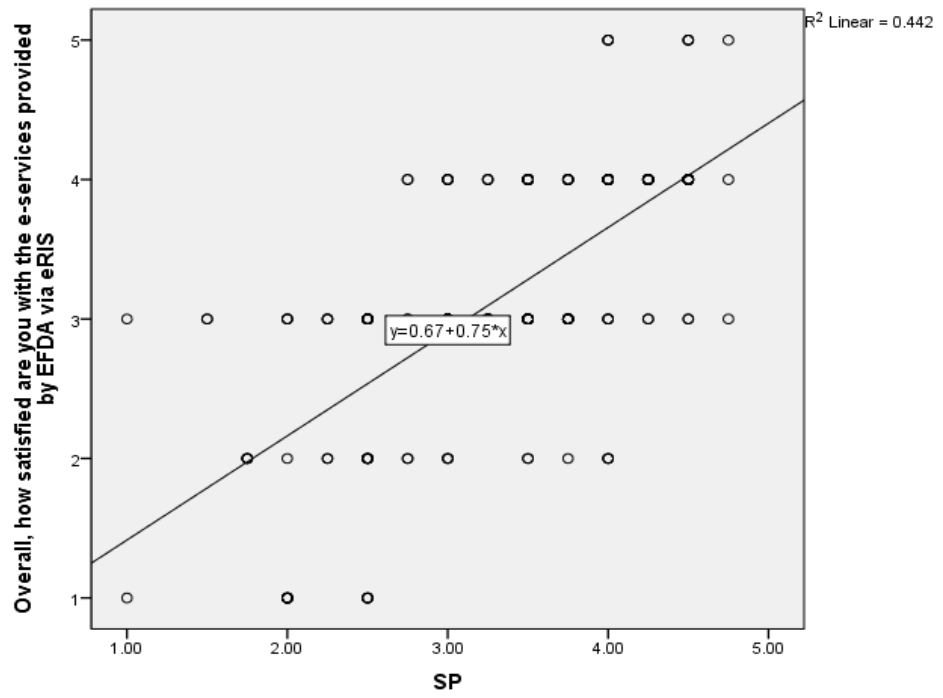### Dependent Variable: Overall, how satisfied are you with the e-services provided by EFDA via eRIS

Source: SPSS output (survey data, 2020)

Normal Q-Q Plot of Standardized Residual
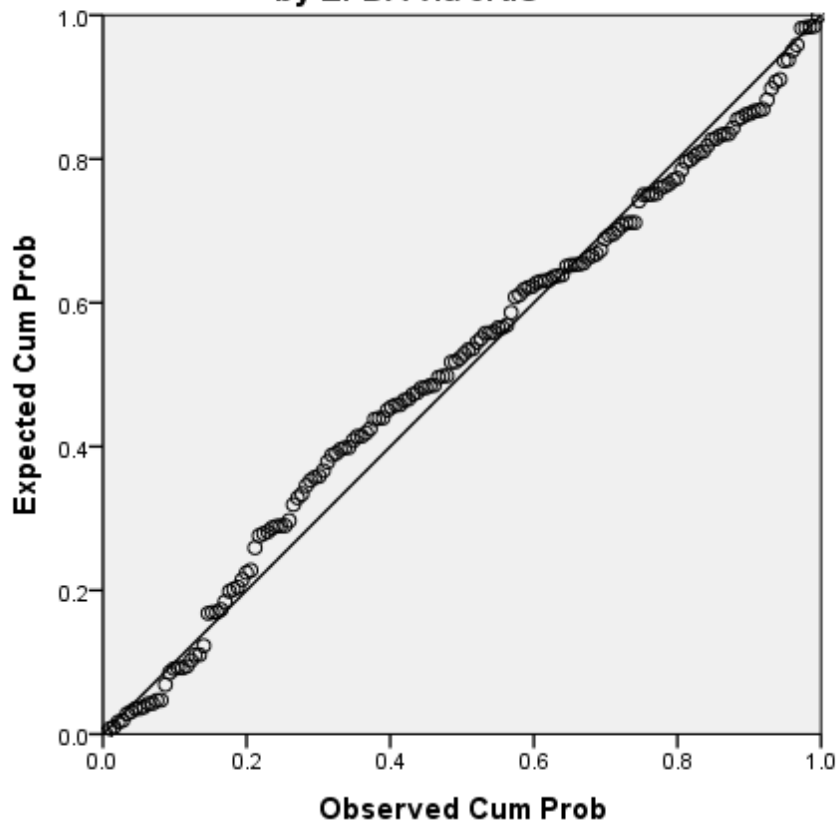
Source: SPSS output (survey data, 2020)

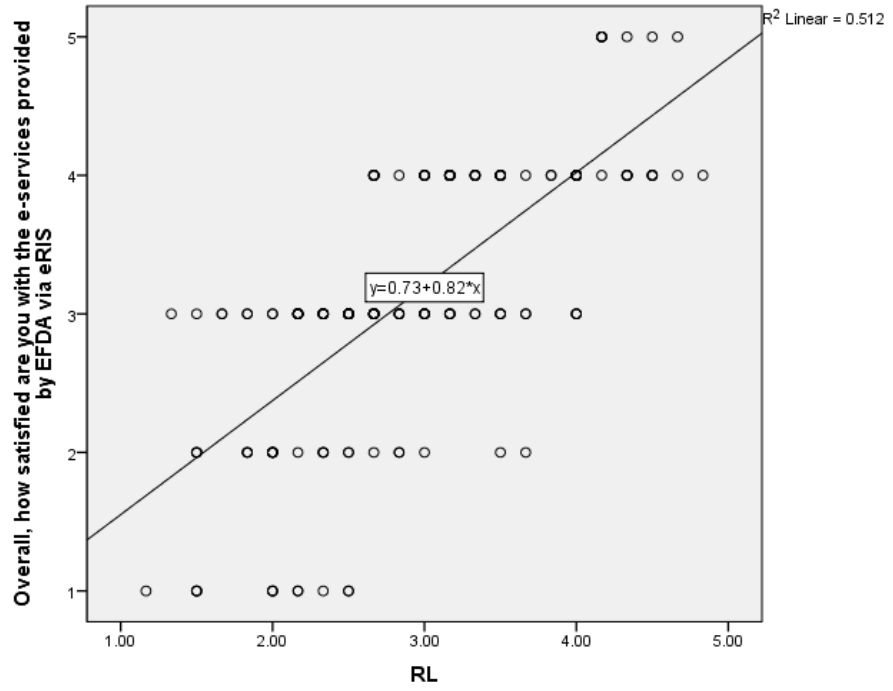**Appendix (c2): Homoscedasticity**

Scatterplot

Dependent Variable: Overall, how satisfied are you with the e-services provided by EFDA via eRIS
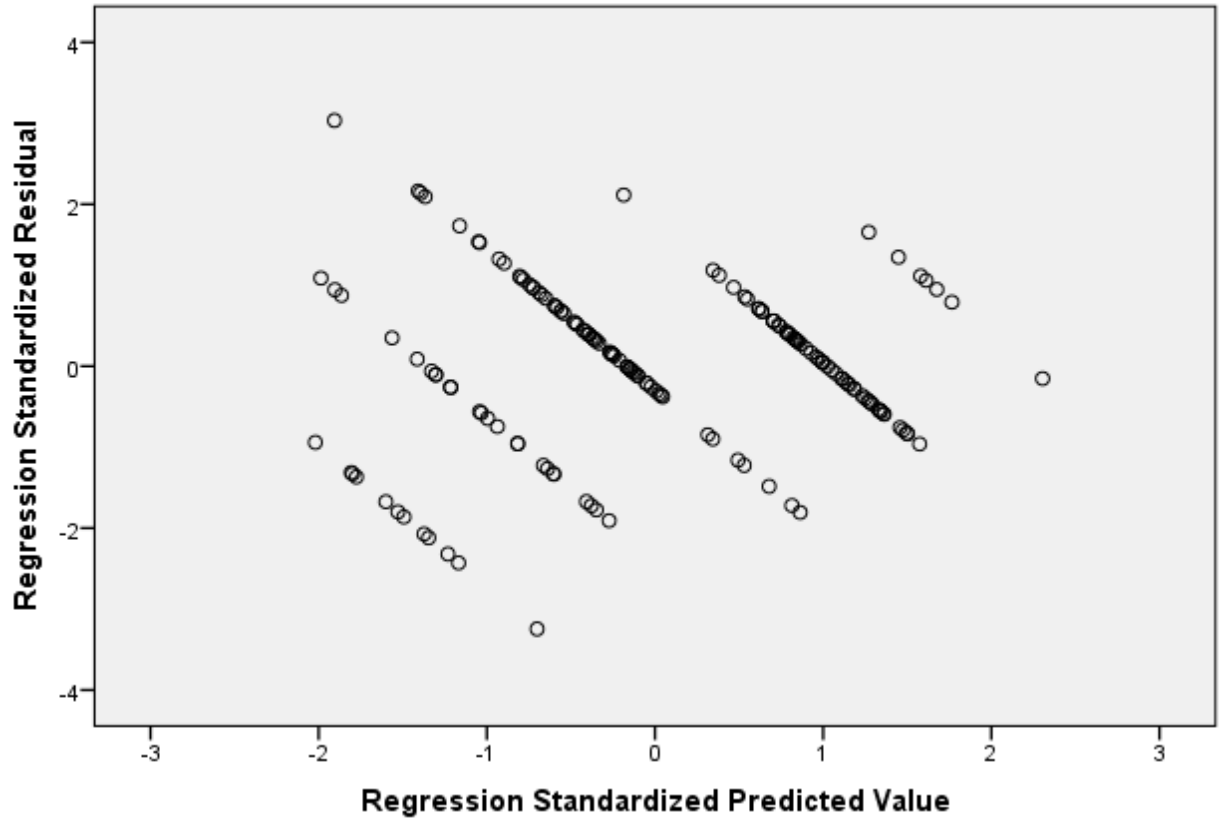
Source: SPSS output (survey data, 2020)

Appendix (c3): Linearity

Source: SPSS output (survey data, 2020)