

USABILITY EVALUATION OF IRAQ GOVERNMENT WEBSITES

ABDULRAHMAN ZEAIN

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USABILITY EVALUATION OF IRAQ GOVERNMENT WEBSITES

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BY ABDULRAHMAN ZEAIN

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Submitted by Abdulrahman ZEAIN

Approval of the Graduate School of Natural and Applied Sciences, Çankaya University.

Prof. Dr. Can ÇOĞUN

Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Prof. Dr. Sıtkı Kemal İDER Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

Assist. Prof. Dr. EROL ÖZÇELİK

Supervisor

Examination Date: 12.09.2019

Examining Committee Members Assoc. Prof. Dr. Gökhan ŞENGÜL

Atılım Univ.

Assist. Prof. Dr. Murat SARAN

Çankaya Univ.

Assist. Prof. Dr. Erol ÖZÇELİK

Çankaya Univ.

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Name, Last Name: Abdulrahman ZEAIN

Signature: Why

Date: 24.09.2019

ABSTRACT

Usability Evaluation of Iraq Government Websites

ZEAIN, Abdulrahman
M.S., Information Technology Department
Supervisor: Assist. Prof. Dr. Erol ÖZÇELİK
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It is well known that electronic government has the potential to promote economic and social development in any country. Electronic government provides opportunities to enhance administrative efficiency of official institutions in the public sector, to decrease administrative and financial corruption, and to build trust between the citizen and the government. Nevertheless, most initiatives aim to construct a successful and comprehensive electronic government in Iraq failed because they increasingly suffer from usability problems.

In terms of electronic government initiatives in Iraq, the model is problematic in spite of great interest on this critical issue because of the existing bureaucracy and administrative corruption in Iraq. Many researchers have confirmed that this country is considered one of the least developed country in terms of electronic government. Thus, the development of electronic government in Iraq requires the promotion of the usability of electronic government. Considering these needs, the main goal of this study is to evaluate the usability of electronic government in Iraq for three most frequently used websites. A total of 30 subjects participated this usability study. The results showed that these three websites suffered from critical usability problems. Suggestions to minimize these usability problems were discussed.

Keywords: electronic government, usability, accessibility, heuristic evaluation, government websites.

ÖZ

Irak Devleti Web sitelerinin Kullanılabilirlik

ZEAIN, Abdulrahman Yüksek Lisans, Bilgi Teknolojileri Anabilim Dalı

Tez Yöneticisi: Dr. Öğr. Üyesi Erol ÖZÇELİK

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Elektronik devletin herhangi bir ülkede ekonomik ve sosyal kalkınmayı teşvik etme potansiyeline sahip olduğu iyi bilinmektedir. Elektronik devlet, kamu sektöründeki resmi kurumların idari verimliliğini arttırmak, idari ve mali yolsuzluğu azaltmak ve vatandaş ile devlet arasında güven oluşturmak için fırsatlar sunmaktadır. Bununla birlikte, Irak'ta bugüne kadar başarılı ve kapsamlı bir elektronik devlet sistemi inşa eden girişimlerin çoğu, kullanılabilirlik sorunlarından dolayı sıkıntı çektikleri için başarısız olmuştur.

Irak'taki elektronik devlet girişimleri açısından, Irak'taki mevcut bürokrasi ve idari yolsuzluk nedeniyle bu kritik konuya olan büyük ilgiye rağmen elektrik devlet modeli sorunludur. Birçok araştırmacı, bu ülkenin elektronik devlet açısından en az gelişmiş ülkelerden biri olduğu sonucuna varmıştır. Bu nedenle, Irak'ta elektronik devletin gelişmesi, elektronik devletin kullanılabilirliğinin geliştirilmesini gerektirmektedir. Bu ihtiyaçlar göz önüne alındığında, bu çalışmanın temel amacı, Irak'ta elektronik devletin en sık kullanılan üç web sitesi için kullanılabilirliği değerlendirmektir. Bu kullanılabilirlik çalışmasında toplam 30 katılımcı yer almıştır. Araştırmanın sonuçları, bu üç web sitesinin kritik kullanılabilirlik problemleri barındırıyor olduğunu göstermiştir. Bu kullanılabilirlik problemlerini minimize etmek için öneriler tartışılmıştır.

Anahtar Kelimeler: elektronik devlet, kullanılabilirlik, erişilebilirlik, bulgusal değerlendirme, devlet web siteleri.

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TABLE OF CONTENTS

STATEMENT OF NON-PLAGIARISM	iii
ABSTRACT	iv
ÖZ	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	vii
LIST OF FIGURES	ix
LIST OF TABLES	x
CHAPTER ONE	1
INTRODUCTION	1
1.1 Problem of the Study	2
1.2 Significance of the Study	3
1.3 Goals of the Study	3
CHAPTER TWO	5
LITERATURE REVIEW	5
2.1 Overview of E-Government	5
2.2 E-Government	6
2.3 E-Government in Iraq	8
2.4 E-Government Challenges	9
2.5 Usability Evaluation of E-Government Websites	9
2.6 E-Government Usability Dimensions	12
2.6.1 Navigation	14
2.6.2 User-help and Feedback	15
2.6.3 Online Services	17
2.6.4 Accessibility Accommodation	19
2.6.5 Information Architecture	25

2.6.6 Legitimacy	27
2.7 Similar Studies	28
CHAPTER THREE	33
MATERIALS AND METHODS	33
3.1 Design of the Study	33
3.2 Tasks	34
3.3 Participants	34
3.4 Data Collection and Instruments	35
3.5 The Evaluated Websites	35
CHAPTER FOUR	36
RESULTS AND ANALYSIS	36
4.1 Results and Analysis	36
CHAPTER FIVE	52
DISCUSSION	52
5.2 Limitations of the Study	
5.3 Implications for Practice	58
5.4 Implications for Research	58
CHAPTER SIX	59
CONCLUSION	59
REFERENCES	61
CURRICULUM VITAE	72
APPENDIX A	73
OUESTIONNAIRE	73

LIST OF FIGURES

Figure 1: Framework of the Six-Dimensions of Usability	13
Figure 2: Accessibility as a Set of Usability	20
Figure 3: Usability and Accessibility as Separate Ideas	21
Figure 4: Usable Accessibility Concept	21

LIST OF TABLES

Table 1: Navigation Variables [81]	15
Table 2: User-help and feedback variables [25])	16
Table 3: Online services variables [81]	18
Table 4: WCAG 2.0 Guidelines (Compiled from the W3C website)	23
Table 5: Intersection between usability heuristics and WCAG 2.0 success star	ıdards
(Source: Moreno et al.) [92]	24
Table 6: Information architecture variables [81]	26
Table 7: Legitimacy Variable (Source: (Dan et al.) [81])	28
Table 8: Gender of participants	
Table 9: Descriptive statistics on satisfaction	
Table 10: Descriptive statistics on simplicity	
Table 11: Descriptive statistics on effectiveness	38
Table 12: Descriptive statistics on reaction time	38
Table 13: Descriptive statistics on efficiently	39
Table 14: Descriptive statistics on comfort	40
Table 15: Descriptive statistics on easiness	40
Table 16: Descriptive statistics on Productive Quickly	41
Table 17: Descriptive statistics on clearness of error messages	42
Table 18: Descriptive statistics on easy of recovery	43
Table 19: Descriptive statistics on Information Clear	43
Table 20: Descriptive statistics on easiness to find needed information	44
Table 21: Descriptive statistics on Easiness to Understand Information Provided	d45
Table 22: Descriptive statistics on Easiness to Complete Work	46
Table 23: Descriptive statistics on Clearness of Organization of Information	47
Table 24: Descriptive statistics on pleasantness of the interface	48
Table 25: Descriptive statistics on Likeness	48

Table 26: Descriptive statistics on Having Expected Functions and Capabilities	49
Table 27: Descriptive statistics on Overall Satisfaction	50
Table 28: Descriptive statistics on Success	51
Table 29: Descriptive statistics on time consumed	51

CHAPTER ONE

INTRODUCTION

During the last two decades, the proliferation of Information and Communication Technology (ICT) have resulted in great positive changes and enhancements in the interactions between citizens and governments. Phenomenon of electronic government is considered to be one of the most important effect of ICT, through which, ICT promoted its effectivity and proficiency of services. These effects resulted in more economic support and social development at both the local and global levels [1].

Electronic government created by almost 95 percent of countries in the United Nations [2]. Electronic government changes the work environment of conventional governments by promoting electronic government services. Internet and computers are no the unique factors in any e-government form, but rather the gap between the government and citizens' perceptions on e-Government must be taken in account. Usability has gained importance with the transformation of public entities into electronic government to facilitate the usability of systems and decrease costs [3]. Nevertheless, the aspects of usability of electronic government have not been investigated adequately. Web developers always address the functional requirements and endeavor to avoid non-functional necessities associated with usability and website acceptance. Casaló et al. [4] stated that failure in achieving satisfactory levels of usability of electronic government services impends not only electronic government initiatives but similarly the relationship between citizens and government. One of the most significant factors when identifying the success of electronic government project is the usability and this must be reflected to users across electronic government websites. Thus, any electronic government project must take great interest in its design and implementation strategy because it is the cornerstone to the success of a project.

According to Anderson [5], "although few could criticize about the quantity of information on government websites, various have criticized the simplicity with which users can discover specific information" (p. 9).

One of the most significant aspect of usability between users and system is the website interface [6]. Efficiency and effectiveness of use for any system must be the main goal for interface designers and a website must be deliver a pleasant user experience [7] [8] [9].

According to Wu et al. [10], user interface design issues are extremely important for electronic government success. Thus, without good usability on electronic government websites, electronic government would endure to find problems when cooperating with users.

1.1 Problem of the Study

The benefits of an electronic government depend on the effective and efficient management of the country's institutions to promote the provision of public services. Guaranteeing the diffusion of electronic government systems successfully is the main goal of each initiative of electronic government [11]. This issue has motivated many industries and academics to monitor and enhance the usability of these systems of continuously as a means guaranteeing its diffusion successfully [12] [13] [14] [15] [16] [17]. Moreover, [18] stated that despite this, electronic government has witnessed great growth. However, it cannot achieve all of its benefits without determining and processing current and future utilization barriers. Therefore, it is clear that preserving the usability criteria of electronic government is the optimal situation for any country to adopt electronic government.

Several studies and researches in the literature have focused on the approaches of evaluating and promoting usability of electronic governments. However, [19] explain that even though electronic government brings useful visions, the systems of current electronic government are still plagued by many usability problems [13]. Accordingly, many electronic government initiatives have failed because of usability problems [20] [21].

Currently, electronic government projects are considered a great change from everything familiar to the recipients of the society in terms of conventional government services. In spite of Iraqi government initiatives and efforts in recent years to shift to electronic government, there have been many issues that had to be taken into account; for instance, the efficiency and effectiveness of Iraqi electronic government websites, and user satisfaction towards these websites. Furthermore, the lack of studies and researchers who evaluate the usability of Iraqi government websites is a motivation for the current study. This study has the potential to trigger further studies on this subject.

1.2 Significance of the Study

Although developing countries became more interested in electronic government, most of their governments face many challenges to make their websites usable [22]. In spite of these challenges, usability has become one of the most significant elements affecting users. In addition, the success or failure of electronic government services depend on the usability of the websites that these services are provided [23]. Moreover, it seems that there is a lack of studies on the usability of electronic government websites especially in Iraq. This presents us with an important gap in the literature.

One of the most significant elements which affect electronic government is the lack of understanding on the users that will have a negative impact on the usability of websites. This is a very important issue in developing countries such as Iraq. Our study will contribute in identifying the factors which may help to enhance the electronic government websites usability in Iraq.

1.3 Goals of the Study

The main goal of our study is to examine the usability of Iraqi electronic government websites

The study has the following sub-goals as:

— Examining the efficiency of the three most frequently used electronic government websites in Iraq;

 Assessing the effectiveness of the three most frequently used electronic government websites in Iraq;

Evaluating the satisfaction of the three most frequently used electronic government websites in Iraq.

1.4 Research Questions

Our study aims to answer the following main question:

• Are the most frequently used three websites of the Iraq government usable?

The above question is divided into the following sub-questions:

- Are the most frequently used three websites efficient to use?
- Are the most frequently used three websites effective to use?
- Are users satisfied for using these websites?

1.6 Thesis Structure

The thesis includes six chapters as follows:

Chapter One includes an introduction to the present study in addition to a description of the goals and significance of the current study.

Chapter Two provides a literature review about the study and a comprehensive review of a number of web accessibility evaluations. In addition, it delivers the guidelines for web accessibility.

Chapter Three delivers the methodology of the study.

Chapter Four delivers the results of our study.

Chapter Five presents the conclusion of the study.

CHAPTER TWO

LITERATURE REVIEW

This section presents an overview of e-government and a discussion on what e-government usability entails.

2.1 Overview of E-Government

Previous public administration focused on three main models in order to deliver public services, namely face-to-face, telephone, and postal mail services [24]. In the highlight of technological developments during the last two decades, a fourth method was created to provide public services, known as electronic government [25].

Electronic government has gained popularity over the last two decades where it has been adopted by all countries around the world [26] [27]. This has increased the need to develop electronic government abilities to guarantee successful diffusion of electronic government. Electronic government diffusion refers to developing and adopting electronic government solutions [28]. Understanding the issues to diffuse electronic government is considered necessary in order to guarantee the success of electronic government initiatives [29]. Electronic government is a multiphase system that lies between public administration systems and information systems [30].

The prevailing areas of research focused on diffusing electronic government in terms of the technological aspects of electronic government, such as the ability to use online electronic government systems, technological acceptance models, social and economic factors and infrastructure of resources [28]. All of the aspects mentioned above of electronic government dimensions have critical importance to promote the diffusion of electronic government around the world. Nevertheless, in our study, we will focus only on the technological aspects of electronic government such as the usability of electronic government because usability represents the main issue in the technological aspect of electronic government.

In addition, it is clear from the perspective of technology acceptance that usability features, for example perceived ease of use and observed usefulness, are core dimensions [31] [32]. Furthermore, usability will be restricted on specific sites of electronic government where they are widely used in Iraq as platforms of interaction between the government and citizens.

2.2 E-Government

Electronic government, or e-government, can be defined as a set of operations and supportive governmental interaction systems that help and activate the interaction of citizens with government to access provided services. The non-traditional speed of the development of information and communication technology and great efficiency and business efficacy have made a high impact in a wide area of daily work and interaction between citizens, companies and economic activities. Nevertheless, considering technology as a means to decrease costs and increase efficiency is not a good practice because it must interact and respond to agent needs [33]. Gene, Bruce and Karin [34] mention, "The government role has changed from prominent invention to bendable businesses that often have better equipment and more technical expertise. The Internet and associated technologies have donated to globalization by increase both the amount of information existing in the environment and the information flow speed" (p. 1).

The concept of electronic government is an invented idea that allows government to control and manage services. Currently, there are many definitions of e-government. For instance, due to the existing multiphase phenomenon, which includes many fields of studies and scientists from different fields, this diversity, makes the creation of a practical definition of electronic government a very complex issue. Furthermore, e-government has multiple substitute terms such as electronic government, digital government and online government.

E-government includes interactions between different entities. Scientists differ in their classification of electronic government, but most consider the following four classifications:

• Government-to-Government (G2G)

- Government-to-Business (G2B)
- Government-to-Citizens (G2C)
- Government-to-Employees (G2E)

Shuiqing et al. [35] gave electronic government a specific definition, namely that e-government is the engagement of the Internet and World Wide Web for government services information and transmission of these services to citizens. In order to enhance efficiency, efficacy, and the provision of services to citizens, the electronic government concept would depend on information and communication technology. Therefore, electronic government services, operations, provisions and speed should be considered. Reffat[36] discussed that to develop a successful electronic government, it is important to take into account the following advantages:

- Delivery of electronic and integrated public services: Ministries can deliver
 not only electronic services but they can also deliver many added and
 integrated services instead of increasing the number of agencies or offices or
 many websites.
- **Bridging the good digital divide:** Governments can help to allow access to new technology for disadvantaged groups in society.
- Achieving lifelong learning: By making electronic learning more widespread, it is possible to realize and promote the concept of education as something being unending or as something which does not end when a person finishes school.
- Building a government-citizen relationship: Governments may use new technology for treating people as individuals and deliver adapted services.
 People centricity feature put people in more responsible for their relationship with government to gain trust and reassurance in the public sector.
- Creating a more government participative form: Electronic government may lead to enhance democracy. Locally, municipalities can provide much support in online and forum discussions in order to inform decision makers.

2.3 E-Government in Iraq

In 2004, the Iraqi Ministry of Science and Technology (MST) signed a contract with an Italian company to express Iraq's electronic government. At that time, the Iraqi government started to reap the benefits of electronic government technology. This project consisted of three steps, which are summarized as below [37]:

- **First project:** Creation of infrastructures for information technology and providing services to the employees of the Ministry of Science and Technology. The period of this project was two years.
- Second project: Providing two types of service for the employees in every ministry in Iraq and also for the trade sector. The period of this project was five years.
- **Third project:** Planned to provide services to Iraqi citizens. This was a long term project.

Firstly, the Iraqi electronic government project was a small project associated with the electronic traffic system. At the end of 2010, the Iraqi government decided to create a project for electronic government. The most dynamic ministries connected to the office of Prime Minister [37]. The Council of Ministers created the electronic government board in 2009 and it appointed the Ministry of Science and Technology as leader of the board. Since that time, the board provided to each Iraqi ministry electronic government office. The Iraqi government has made the first efforts towards electronic government in 2009. Through an international electronic conference on Iraq in Baghdad with 250 participants from Iraq and the UNDP, the conference received support from the prime minister of Iraq. Moreover, 33 employees from the Iraqi government were sent to obtain suitable training from a UN tutor. The Iraqi government decision makers and UNDP assessed the project and eventually generated new plans for this project in 2011 at the second forum. Furthermore, the UNDP had skilled 200 Iraqi e-government centers around Iraq to produce 10,000 educators. These trainers were needed to inculcate government employees. Finally, in 2012 that board of electronic government conducted the second international conference of electronic government in Iraq. More than 300 people from and various employees of the UNDP

attended this conference. In 2014, they determined to create a new conference of electronic government called "digital local provinces: the bridge to the future" [38].

2.4 E-Government Challenges

The obstacles to electronic governance projects include bureaucratic operations, lack of transparency and equity, lack of resources, lack of trust, lack of citizen participation, digital separation, legal obstacles and poor administration [39] [40]. Consistent with the United Nations E-Government Survey, governments through the world are considered electronic governments as strong approaches which through they can deliver clearness and responsibility, economic growth, social presence, sharing of knowledge, abilities growth, new engagement and better services for health and education.

Electronic governments can motivate the transfer of advanced results, decrease poverty and protect the environment [41]. Electronic governments provide faster access to information with less cost for citizens [42]. The usability of websites is related with the degree to which citizens can access information of website [43]. Citizens adoption success of electronic governance depends on the quality of delivered information, including design, safety and ease of access. Nevertheless, website quality from the perspective of user's associates with usability that is related with searching information easily and accomplishing the tasks in a fast and correct ways [44] [25].

2.5 Usability Evaluation of E-Government Websites

The term 'usability' denotes the aptitude to acquire, to interact and to use a product in order to accomplish its intended goal. The International Organization for Standardization (ISO) 9241-11 defines usability as "The degree to which a product may be used by identified users to accomplish definite objectives with effectiveness, proficiency and fulfillment in the stated perspective of use". Likewise, Neilson has defined the term with ease of using the user interface of a product or service. Neilson made a set of usability heuristic for user interface design that consist of efficiency, remembering, making mistakes and satisfaction. The objective behind measuring usability is to optimize ease of use for products and services. All web designers and developers endeavor to accomplish the highest level of usability for developed websites. In spite of this, several researchers have developed guidelines in order to

help developers to design usable websites; however, limited studies have been conducted on electronic government guideline issues. Governments have recognized the significance of usability of electronic government. Electronic government websites must be usable for all websites users comprising those who suffer from different disabilities [45]. General guidelines are useful in the design phase, but many specific guidelines for electronic government websites are necessary to achieve the intended purpose of these websites. Electronic government websites have not achieved all of their potential because most people cannot use them due to the lack of usability of those websites [25] [19].

Various studies have been conducted in order to measure the usability of electronic government websites in the Arab countries and all over the world. Usability enhancements of governmental websites will lead to an increase in fulfilment for users of those websites. Higher numbers of satisfied users will lead to decreased interaction costs for citizens [46] [47]. Governments face difficulties in finding the best design approaches for websites in terms of communication with users [48]. Therefore, developers must conduct studies to ensure the satisfaction of users of any provided service. Many techniques can be used to achieve this, including user-based testing. User-based testing is considered to be the one of the most valuable method it consists of end users of electronic government websites. Researchers have used this approach for enhancing the usability of websites [49] [50]. Some researchers have the culture of end users and took certain factors such as user experience, disabilities and type of colors and interfaces into account when designing governmental websites [51]. Other studies suggest that evaluation techniques that depend on users must be implemented repeatedly and not once because of the fact that the needs of final users always change over time [52]. In an investigation, taking another evaluation approach by researchers has clarified that it is an effective approach in terms of costs to measure usability of governmental electronic websites [53]. The main challenge faced by researchers in this method is the selection of the most effective strategies for evaluation [54].

If time is limited, the best approach for measuring usability is the use of an automatic tool. A study has examined various usability test tools and it has been discovered that they are more effective than evaluating websites by developers. Furthermore, it has

been found that most developed tools make examinations associated with problems of sight [55]. Another study suggests the evaluators to use of evaluation tools in accordance with web categories, which can be used to preserve the usability level of a website [56]. Current techniques provide a wide set of opportunities to evaluate the use of electronic government websites.

Thus, developers must think to involve the use of all technology categories, services, applications, wireless devices and mobile phones in order to enhance those features for associated parties in electronic government by including citizens, companies and all other governmental units. It is not easy to measure usability and accessibility of various mobile devices using different platforms [57] [58]. South Korea has discussed the importance of having mobile versions of websites of electronic governments. However, there are challenges in finding the best techniques and guidelines [59]. When designing interfaces for mobile applications, developers must also take into consideration different platforms for mobile networks as well as safety considerations [60] [61]. There are few studies on mobile applications for e-government which are still in their early stages.

Usability guidelines that must be conducted in governmental websites differ from guidelines that must be implemented on electronic commerce sites because the nature of the user for each type is different. In addition, electronic government websites do not compete with the other players in the market [62] [63]. Nevertheless, many studies have shown that users face difficulties in using services provided by governments [64] [65]. A field study conducted by Holden et al. found problems on the delivered services [66].

Another field study resulted in discovering that most of the electronic government websites are not reliable in the design nor used principles and topographies [67]. Therefore, there is a necessity for further enhancements in order to fulfill user expectations [68]. According to usability studies, usability guidelines are considered an important example to enhance the quality of governmental electronic websites.

2.6 E-Government Usability Dimensions

The measurement of usability generally entails specific users who perform specific tasks in specific contexts. The concept of usability consists of multiphase dimensions through which specific dimensions are considered suitable only in specific contexts. Any dimension in usability needs to be evaluated to the extent of its suitability in any context before its use in a particular context. The context relies on how to use the system as well as on surrounding circumstances. Furthermore, in specific contexts, the usability dimension may or may not be significant [69]. In our study, we focused on a set of usability dimensions associated with electronic government. In addition, the method of usability evaluation regulates the type of dimensions which can be covered where some usability issues can also be observed by user testing, whereas others could be tested by expert-based approaches. In this study, usability evaluation depends on user testing. In this regard, it was significant to look into usability dimensions that are suitable for electronic government and can be evaluated through experimental evaluations.

Literature on the usability of electronic government websites has dedicated on two sets of heuristics, namely Nielsen's usability heuristics [70] and the six-dimensional framework [25]. Initially, the heuristic was developed by [71], published and used widely to assess the usability of user interface consisting of 10 elements These elements consisted of visibility of system status, compatibility between the system and the real world, controlling user and its independence, reliability and principles, preventing mistakes, gratitude instead of recall, flexibility and effectiveness of use, appealing and minimalist design, helping users to recognize and diagnose as well as recover from errors, and help and certification [70]. Since its creation is more than two decades ago, it has been proven that heuristics can be applied to wide variety of information technology systems [72]. However, scientists over these years have discovered that they need to adapt or expand the Nielsen heuristics in order to improve their applicability in various contexts, such as on electronic government websites [73]. Dissimilar the Nielsen heuristics, the six-dimension framework was developed precisely to evaluate the issues for electronic government websites [25]. This framework development has depended on the collection of many usability variables over a number of years [25]. Later, this framework was evaluated for the first time by

[74] and then modified by [25]. This framework is shown in Figure 1. The dimensions consisted online services, user-help and feedback, legitimacy, navigation, accessibility, information architecture and accommodations of accessibility [75].

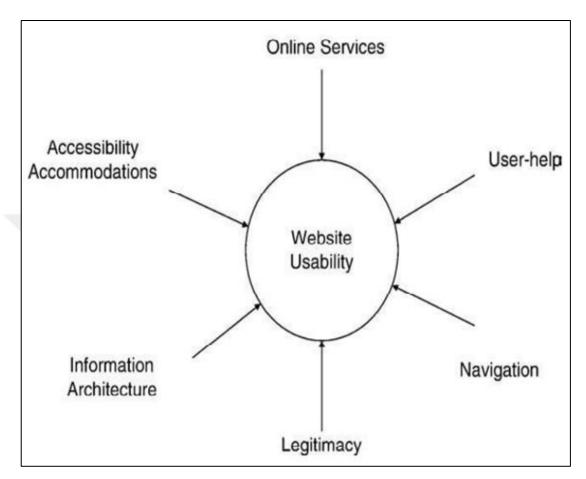


Figure 1: Framework of the Six-Dimensions of Usability [25]

The instrument has examined six dimensions of electronic government websites as clarified in Figure 1 wherein we see that different usability heuristics have been accepted in similar studies. The completeness of the six-dimensional framework and its emphasis on usability of electronic government websites make it a suitable theoretical framework to evaluate the usability of governmental electronic websites in Sub-Saharan Africa. In addition, Web Content Accessibility Guidelines (WCAG) 2.0 are combined with Nielsen's heuristics [76]. Thus, if the accessibility dimension of the six-dimensional framework were assessed depending on WCAG 2.0 criteria, Nielsen's heuristics would have been combined into the six-dimensional framework. Thus, the two heuristics are broadly used to evaluate electronic government websites have been

evaluated. Therefore, this study emphasis on the six-dimensional framework to examine the usability of electronic government websites, with the accessibility dimension depending on WCAG 2.0 criteria. In the following sections, factors will be described in detail.

2.6.1 Navigation

One of the most significant features of electronic government is navigation which allows users to discover the website. Moreover, navigation can be considered to be the user's ability to access and find information effectively [77]. Electronic government websites always include clicking on different links in order to access services and electronic government information. It is necessary to design website with organized menus that users can easily navigate [78]. Shelly, Napier, and Rivers (2009) explained that when the navigation system of a website is being designed, navigation must be accessible. This allows visitors to the website a greater level of participation and discover web pages to acquire information or services that fulfill their needs and expectations [79]. It is known that good navigation on a website allows users to identify their current location on the system and where they have visited as well where they can also visit [25]. [74] that navigation on a website makes it easy for website visitors to identify faster ways to access any needed services. Some of the notified variables used by researchers to examine the navigation of governmental electronic websites comprise electronic government services, links for communication information, links to other agencies and navigation variables. Table 1 shows these navigation variables [80]. Even with the insights gathered from those researches and studies, websites of existing e-government are still beleaguered by many usability problems such as difficulty of understanding content, unpredictable layouts, poor navigation competences, confusion, difficulty to use help functions, and lack of consistency [16]. When information and services are uploaded onto websites, their purpose is public consumption. Thus, the purpose of these websites will be defeated if user is not able to access information or electronic services.

Table 1: Navigation Variables [81]

Navigation Variables	Operational Definitions	
E-government services	E-government services allowed through direct links to	
	conduct many online functions or transactions	
Link to contact	Direct links willingly existing to the host agency	
information		
Link to other agencies	Aptitude to make contacts directly through links with	
	other governmental agencies	
Navigation tools	The number of navigation tools provided to the user	

Moreover, electronic government systems are not beneficial for citizens if they are not able to find the information needed. Therefore, the development of electronic government websites will be hindered if citizens prefer to go to actual offices for accessing electronic government services and any information they require. Consequently, it is still important to evaluate navigation in electronic government and ensure from its design that it facilitates users to find required information. Good navigation is considered a facilitator that allow users to benefit from e-government, thereby increasing the comprehensive navigation experience for users.

2.6.2 User-help and Feedback

Help for the user and response is considered one of the dimensions of usability which supports the use of the system by delivering help on how to use the system and how to access demanded services and information. Factors attributed to helping a user and giving feedback are included in literature [25] and they include information about websites, such as "e-mail us" feedback, index, foreign language exchange, and search. Table 2 explains some of these variables.

Table 2: User-help and feedback variables [25])

User Help and	Operational Definition
Feedback	
About the site	Link about the site for novice user
E-mail us	Self-addressed e-mail template for site help
Feedback	Site comment link
Foreign language exchange	Translated site version(s) for non-native users
Index	Novice-oriented site information listing
DA/wireless	Mobile Internet device access capability
Search	Specific site content locator

The assumption of electronic government requires guaranteeing that all citizens with skills and abilities in are probable users of websites. In this context, it is necessary for electronic government websites to present the features of assistance. According to [80], it is necessary that all governmental websites have useful information that can provide systematic guidelines for users during their visit to the website. Without provision of user help and comments, users will be disappointed when they experience problems with websites [25], such as when it is impossible to identify how to solve problems they encounter during their attempt to access or use electronic government services. Electronic government websites that are characterized by ease of use need to provide an online visual assistance function in all web pages [16]. Similarly, the search function needs to provide accurate information in addition to beneficial evidence to support user search operations [77].

The provision of user assistance and comments is considered to be a vital issue to guarantee that users stay in communication with a website. If users are not able to obtain assistance at any time, they will not be able to use the system efficiently or proficiently after work hours when there is no one available to respond questions in real time. However, user assistance may allow users to learn easily how to overcome problems they may experience in the system.

2.6.3 Online Services

The electronic government online services dimension focuses on the content value and information available for users. In addition, it focuses on the ability of users on accomplishing any required task on a website. [25] Defines dimension of online services as the task that electronic government can complete electronically across an electronic government website at any time using the Internet. The type of services provided by electronic government websites is very important because it identifies the perceived value of the website. For instance, an electronic government website that allows users to file tax returns will have a higher value than one providing only information about taxes in spite of the fact that it is still required that users wait in tax offices to lodge tax returns manually and deal with users. [82] Stated that the satisfaction of customers regarding online electronic government services was far greater than that of paper-based services.

Researchers [25] [80] mentioned that a number of variables related to this dimension comprise basic information, downloadable forms, chat message boards, e-mail updates, communications with officers, employment information, databases, papers/books, forms, applications of electronic commerce and multimedia applications. Table 3 shows the operational definitions of the mentioned online services variables.

Table 3: Online services variables [81]

Online Services Variables	Operational Definitions
Chat areas/message boards	Areas for communication-oriented/organized around a common interest
Communications with officials	Contact information for individuals responsible for the services
Documents/publications	Official printable material from the agency
Downloadable forms	Printable forms that can be assessed on user demand
E-commerce applications	Applications for commerce transactions
E-mail updates	Registration for e-mail update services for the interested users
Employment information	Online access to public job information on demand
Interactive databases	Online access to public databases on demand
Interactive forms	Online form completion and submission on demand
Multimedia applications	Online access to videos or audio clips on demand

The online services list presented in Table 3 includes a general set of services that users can access through electronic government websites. Roach and Cayer emphasize that users may login into electronic government websites to access information and services; it is important for online services provided by governments to deliver real value to users [80]. In order to make electronic governmental websites provide real

value for users, users must be able to access the online services they need [24]. This feature is one of the significant features of electronic government websites that operate widely as a basic dimension in the literature for adopting electronic government. The type and number of online services delivered by an electronic government website determine the value and probable usefulness of the website to people. This is important for electronic government because the perceived value of an electronic government website has a positive effect on user adoption and use of electronic government services [83] [84].

Notwithstanding the above, the online services dimension may include a broad set of electronic government services, the main goal of which is to ensure that delivered services provide real value for people in a manner that makes it beneficial to adopt and use continuously.

2.6.4 Accessibility

Accessibility denotes to the ability to make websites accessible to a broad set of people in spite of their technical abilities and probable disabilities. It must guarantee that all users have equal rights to information and functionality [85]. [95] Defined website accessibility as "a method to web design that purposes for best presence, both in terms of people who use websites and the skills that are used in the process." This means that any person wishing to use electronic government services must be able to access the system in spite of age, disability, culture, income, education and religion [87]. Moreover, they must be able to access websites and enjoy their services despite whether the users have personal computers, mobile phones, tablets, laptops, or the different browser platforms used for accessing websites, such as Netscape, Mozilla Firefox, Google Chrome, Internet Explorer, , or Safari . Therefore, accessibility has great significance particularly in the field of the usability of electronic government because of the need to guarantee the availability of governmental services to all people, including people with disabilities. Previous literature provides three different concepts regarding the relationship between accessibility and usability. Figure 2 presents an illustrative explanation for one of this notion.

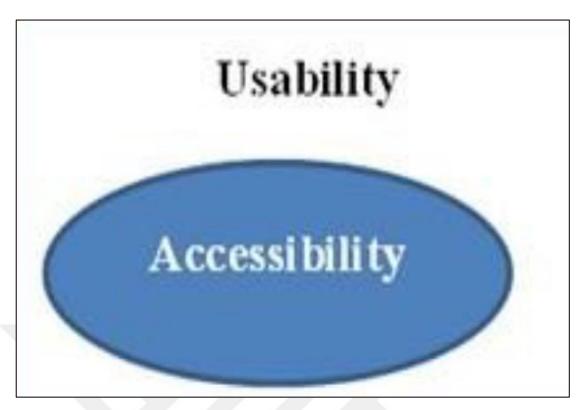


Figure 2: Accessibility as a Set of Usability (Source: Kapsi et al., 2009) [87]

Researchers [88] [89] providing this idea have based their theoretical groundwork on the ISO 9241-11 (1998) usability definition. When web interfaces need to be usable, they need to be first accessible. Another notion is the have usability and accessibility as two separate concepts. Figure 3 shows a descriptive illustration of this notion. This school of thought bases its assertions on the notion that ideas of accessibility are characterized in its nature [87].

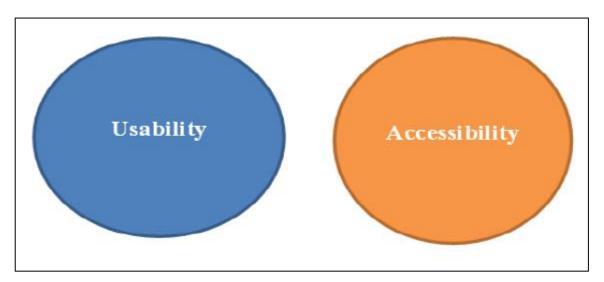


Figure 3: Usability and Accessibility as Separate Ideas (Source: Kapsi et al., 2009) [87]

The last school of thought provides the term *usable*, which is the intersection between ease of use and accessibility. Usable accessibility can be defined as the design of usable interfaces from the perspective of the user and fulfilling the needs of users in design operations and who may encounter any type of restriction on knowledge or functionality [90]. Figure 4 presents the concept of usable accessibility.

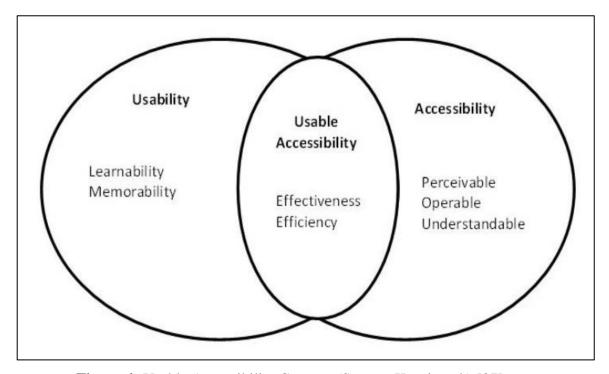


Figure 4: Usable Accessibility Concept (Source: Kapsi et al.) [87]

A usable approach to accessibility considers the intersection between usability heuristics as provided by Nielsen [72] and the WGAC 2.0 delivered by the World Wide Web Consortium (W3C, 2008) [91]. Table 4 offerings the accessibility of WCAG 2.0.

Table 4: WCAG 2.0 Guidelines (Compiled from the W3C website)

Guideline	Description	
1. Perceivable		
1.1. Text alternatives	Providing text alternatives for any non-text content so	
	that it can be changed into other forms (formats) that	
	people need, such as large print, Braille, speech, symbols	
	or simpler language	
1.2. Time-based media	Providing alternatives for time-based media	
1.3. Adaptable	Creating content that can be presented in different ways	
	(such as simpler layouts) without losing information or	
	structure	
1.4. Distinguishable	Making it easier for users to see and hear content,	
	including separating foreground from background	
2. Operable		
2.1. Keyboard accessible	Making all functionality available from a keyboard	
2.2. Enough time	Providing users with sufficient time to read and use the	
	content	
2.3. Seizures	Not designing content in a way that is known to cause	
	seizures	
2.4. Navigable	Providing ways to help users navigate, find content, and	
	determine where they are	
3. Understandable		
3.1. Readable	Making text content readable and understandable	
3.2. Predictable	Making web pages appear and operate in predictable	
	ways	
3.3. Input Assistance	Helping users avoid and correct mistakes	
4. Robust		
4.1. Compatible	Maximizing compatibility with current and future user	
	agents, including assistive technologies	
L		

Table 5: Intersection between usability heuristics and WCAG 2.0 success standards (Source: Moreno et al.) [92]

Usability Heuristics	WCAG 2.0	Specific subcategory*
	Success	
	Criteria	
Visibility of system	2.4	2.4.2/2.4.3/2.4.4/2.4.6/2.4.8/2.4.9/2.4.10
status		
Match between the	3.1 and 3.2	3.1.2/3.1.3/3.1.4/3.1.5/3.1.6/3.2.3
system and the real		
world		
User control and	1.4 and 2.2	1.4.2/1.4.4/1.4.8/2.2.1/2.2.2/2.2.4
freedom		
Consistency and	3.2	3.2.3/3.2.4
standards		
Error prevention	3.3	3.3.1/3.3.2/3.3.4/3.3.6
Recognition rather than	1.3 and 2.4	1.3.1/2.4.2/2.4.6/2.4.10
recall		
Flexibility and	2.4	2.4.1/2.4.3
efficiency of use		
Aesthetic and		
minimalist design		
Help users to recognize,	3.3	3.3.3
diagnose, and recover		
from errors		
Help and	3.3	3.3.5
documentation		pagies visit the WCAG 2.0 guideline

^{*}Notes: To access the specific subcategories, visit the WCAG 2.0 guideline published by the W3C at https://www.w3.org/TR/WCAG20/.

After reviewing these three accessibility approaches, our study adopts the first one that defines accessibility as a subset of usability. This approach directly suits the field of

usability of electronic government where a website of electronic government is usually created to provide services for a broad set of users from different cultures, academic qualifications, levels of income, functions and cognitive abilities and different ages. Moreover, this was the approach followed by previous studies regarding the usability of electronic governments [25] [81].

Most of the studies conducted until now on accessibility on governmental websites have arisen from the developed countries [11] [92] [93] [94]. One of the most common results of these studies is the fact that many electronic government websites face many accessibility problems. In several countries such as the United States of America, it was compulsory for all governmental websites to fulfill accessibility guidelines as stipulated in Section 508 of the Rehabilitation Act [93] [94]. Nevertheless, many electronic government websites in the United States are still facing optimal accessibility problems [11]. This fact implies that accessibility may not be very easy. However, the unique method to promote accessibility to electronic government websites is to check their status for accessibility in order to determine any accessibility problems that threaten these websites in a specific region or country.

2.6.5 Information Architecture

The information architecture of a website includes the basic structure that allows for all the parts of the website to work together harmoniously [95]. Information architecture determines the relationship between a website's content and its functions [96]. Therefore, most aspects of information architecture can be found inside the hidden internal design for final users, which permits users to implicitly experience the design, content, and function of the website [97]. Accordingly, it is not possible to evaluate the information architecture of a website completely without accessing the internal contents of the website. Baker defines the concept of information architecture in the three-dimensional framework with regard to the user interface, which can be evaluated without accessing the internal contents of the website [25]. Thus, the use of information architecture in this study is restricted to the constituents of the information architecture of the user interface of electronic government websites.

The information architecture concept focuses on the ability to use electronic government (in accordance with the six dimensions framework) in terms of organizing, configuring and classifying information effectively. This shows the organization of information on an electronic government website and how it appears to the user for the first time [25] [74]. Information architecture includes the organization and presentation of information of a website especially in the provision of services and functionality. In other words, information architecture includes the organization of information in a system through a number of factors such as the placement of signs, navigation and search functions that promote usability of the system. When the architecture of information is designed carefully, it allows electronic government users to find any needed information easily. Moreover, it allows the easy accomplishment of tasks. Information architecture enables electronic government users to understand how elements associate with each other in the system. Information associating with the structure of the information includes organizations/sections, being userfocused/centric, division of government, branding/structure/metaphor, personalized /customizable characteristics and services [80] [81]. Table 6 illustrates the operational definitions of these elements.

Table 6: Information architecture variables [81]

Information	Operational Definition	
Architecture Factors		
Agencies/departments	Agency or government ministry listings	
User-focused/audience-	User-centric appearance on the site particularly	
centric	directed to new users and to those with little	
	information about information and communication	
	technology and government organizations	
Division of government	Documentation of kind of governments.	
Branding/structure/	Publicly recognizable identity or image or symbol	
Metaphor	communicated; e.g., national flag, logo	
Personalized/customizable	Structures personalized to fulfill users' preferences	
characteristics		
Services	Agency or government ministry's functions being	
	prominent for novice users	

it is difficult for users to find what they need. [98] Focused on the need to organize information carefully on a website in order to facilitate utilization of the system. In general, users abandon a system if they encounter difficulty in its use. Furthermore, since the structure of information has an influence on the ease of use of the system, it becomes necessary in electronic government for this to be noticed and that the ease of use be a significant element that affects the adoption of electronic government [99]. The architecture of information is considered very significant and it is the backbone of other dimensions such as navigation and online services. It is difficult to design effective navigation or search functions on a website, which in itself is considered vital to promoting usability. For instance, the provision of movement paths for users depends on suitable designs for the engineering of website information. In spite of this, the structure of information is hidden and cannot be seen directly. It directs user interaction with electronic government websites and therefore, the user is the overall UX. The reason for this is that suitable architecture of information will facilitate usability and accessibility and it is still necessary that electronic government websites depend on good information structure to deliver acceptable and pleasing UXs. This will guarantee the participation of users and thus, increase opportunities for use of electronic government systems by people.

Without the suitable organization of information on an electronic government website,

2.6.6 Legitimacy

When people use electronic government websites and perform specific tasks, they must ensure that the website with which they are interacting actually belongs to the government. Confirmation of this is usually provided through the legitimacy characteristics on electronic government websites.

Legitimacy delivers evidence of trust for users that a specific website is specialized for official governmental affairs.) [80] Stated that users perceive legitimacy characteristics such that their needs for privacy and safety are authorized by an actual governmental office. In this regard, it is necessary to confirm the characteristics of legitimacy in every part of a website. Legitimacy variables include authentication password or digital signing, contact information, disclaimer statements, privacy policies, security policies and webmaster contacts. Table 7 presents the definitions of these legitimacy variables.

If an electronic government website does not include legitimacy, users will not gain the trust that motivates them to replace physical services with electronic services. Previous electronic government literature has referred to the strong effect of trust in adopting and using electronic government [100]. Many electronic government services need from the user interactions with electronic government websites where users may be required to complete personal data forms. In this context, people need to be ensured that their information will proceed to the suitable electronic government management. The best approach to increase trust in electronic government websites is to guarantee that legitimacy variables appear on all browsers of a website. This refers to the need of checking and identifying that an electronic government website is compatible with legitimacy variables.

Table 7: Legitimacy Variable (Source: (Dan et al.) [81])

Legitimacy variables	Definition
Authentication	Visible machineries to regulate site uniqueness or
password/digital sign	affiliation
Contact information	Contact information for users to address questions to and
	to be guaranteed that it is a trustworthy and official
	government organization
Disclaimer statements	Expose data about the site notifying users or visitors of
	what it is about or not about
Privacy policy	Declarations about the degree to which privacy is honored
	or preserved
Security policy	Declarations about the degree to which security is honored
	or preserved
Webmaster contact	Recognizable website director communication

2.7 Similar Studies

[101] Present a study in which they evaluated usability for Ugandan governmental websites. In this study, they evaluated four websites, namely Ministry of Health, Ministry of Education and Sports, Ministry of Justice and Constitutional Affairs and

Ministry of Foreign Affairs. The results of the study clarified that these four websites were partially usable in terms of design and navigation, but they are poor in terms of identifying legal policies. Moreover, the evaluation results of these websites showed a clear image of what needs to be enhanced according to international website design criteria.

Their study mentioned the electronic government concept and its definition and a comprehensive description of its concept and how it can be applied in four stages, namely (1) website creation, (2) initial two-way interaction, (3) online transactions and (4) comprehensive government portals. They conducted a full evaluation for every page linked to the main page for the four governmental websites.

[102] Evaluated the usability of electronic government for Bangladesh. Firstly, they appraised the literature of electronic government in the country and clarified the importance of computer literacy suffer by this country. They mentioned that computer literacy in Bangladesh had decreased from 70 percent to 68 percent, which was due to the government's interest in this issue. Moreover, they mentioned the interest of their government in electronic government projects in all governmental ministries and institutions.

Their study included an investigation of the extent to which computers occupy our life. They confirmed that 29% of citizens over five years of age use a computer at least once a day and about 30% of the population obtain electronic government services. The study emphasized the usability of electronic government in the first place, that interactions with electronic government must be enhanced, and that users enjoy these services. The main objective of this study was to highlight electronic government websites and their usability by evaluating usability standards in Bangladesh with usability evaluation standard tools. The study concluded that electronic government websites suffer from real usability problems. In addition, they stated that user interfaces need enhancements in order to solve general usability problems and increase citizen acceptance of these websites.

Therefore, practitioners including web designers and developers must follow the current design guidelines in order to design or re-design the Bangladesh electronic

government websites. Apart from this, through the development process of electronic government websites, a practitioner must perform the evaluation of usability from the early phase of web development.

[103] Analyzed and evaluated electronic government websites in Jordan in terms of their accessibility, usability, transparency and responsiveness. The number of investigated websites amounted to thirty governmental websites. In terms of usability, they evaluated these thirty websites separately and they examined the characteristics associated with each website that increase usability and navigation and find the correct information in a flexible manner. The number of characteristics that they checked amounted to 12 characteristics including office phone numbers, office addresses, online publications, external links to other websites, multiple methods of information provision (audio clips, video clips), obtainability of bi-lingual information, site maps, commonly asked questions, online services, email addresses, search capability, and broadcast of events. These 12 characteristics may help to obtain online services and information for citizens. They found that all of these government websites experienced problems associated with accessibility and usability, which makes it difficult for people who suffer from different disabilities to interact with websites effectively. Moreover, the study results pointed out that these websites had problems associated with responsiveness, and therefore, they did not work effectively on different digital devices. In terms of usability, they discovered that most of these websites did not take into consideration user expectation and the needs by the absence of many characteristics that facilitate interaction between users and the electronic government website. Furthermore, the evaluation results and manual testing found that the majority of these websites do not employ the same design where there should be consistency and the use of the same criteria and characteristics.

[104] In their study discussed usability of government websites in Pakistan. They first described the importance of governments providing governmental websites to citizens. They selected a number of government websites and selected thirty participants to solve three tasks for each website. This study reports a user study that was implemented to identify whether the designed outline accomplishes the Nielsen's usability heuristics. For this reason, they had the participants to perform many tasks. The pre-test was completed before conducting these tasks and the users completed

post-test questionnaires after conducting these tasks. Quantitative data was collected based on the completed questionnaires and qualitative data was collected by observing the users. The post-test questionnaire was administered in order to examine the usability heuristics for the selected websites. This questionnaire consisted of three elements of Nielsen's heuristics of usability, which were asked for each website.

The analysis revealed the importance of three features, namely efficiency, memorability and pleasantness. It was perceived that the designed template usability of the Statutory Bodies websites had been enhanced. It was clarified that user replies to the factors of effectiveness, importance and satisfaction were enhanced for the proposed outline. This work is a part of the study which may lead to concepts of enhancing the usability of government websites of Pakistan. Thus, it becomes possible to design rules for electronic government in Pakistan based on these results.

[105] Evaluated accessibility and usability for Libyan government websites and tested many government websites in order to analyze their usability and accessibility criteria. They investigated and tested ten websites. Usability was evaluated by specific tasks. Nielsen's heuristic evaluation method was applied. The researchers monitored the participants while they were carrying out their tasks and taking notes.

The time consumed for each task was 25 minutes. One of the most important evaluated websites was the Management of Scholarships website. This site is very important as it is considered a platform for the mail tracking system for graduate students studying abroad. The results suggested that the website suffered from various usability problems. One of the important difficulties was the difficulty to access the mail tracking system on the website. The other nine websites suffered from many problems regarding usability. The participants of study valued the same usability problems with different levels of severity. For instance, while some of the participants conveyed an exact usability problem to be 'minor' or 'major,' others considered the same problem to be 'catastrophic'. According to the obtained results, more than half of the usability problems were regarded as main and catastrophic.

[106] Presented a study about the usability of Arab government websites. In this study, they clarified that web designers and developers must follow guidelines in order to obtain user-friendly interfaces. They provided 18 guidelines to analyze the usability of government websites in general and Arab government websites precisely.

Additionally, they mentioned how to apply those 18 guidelines in order to evaluate their validity.

These guidelines are separated into three parts: interface design, website content and the logical flow of the website. The website interface design guidelines help the user to be satisfied with the interface when he navigates the website pages. A reliable and well-designed website has the user conclude that the website can be reliable. The content guidelines pertain to how the content is prepared, secured, and updated. The logical flow of the website is significant in making the use of the electronic services easier for the user.

Experiencing difficulties in navigating the website primes a user with the desire to go to a government organization to obtain service or information in place of utilizing the electronic government website. There are several electronic governmental guidelines and directions to design and assess electronic government websites, but having usability guidelines particularly for electronic government websites will make discovering the main problems simple. The results showed that the offered set of guidelines can be used to recognize qualitative matches and dissimilarities with user testing and that the new set is best and suitable to evaluate general and electronic governmental usability.

CHAPTER THREE

MATERIALS AND METHODS

3.1 Design of the Study

The purpose of these tasks is to evaluate the usability of these sites by heuristic evaluation. Heuristic evaluation is considered one of the most important and common techniques for usability problems [107]. This evaluation approach has been used in many studies to evaluate the usability of governmental sites (e.g., [108] [109] [110]). Heuristic evaluation of usability does not require special equipment and it helps on evaluating the site in short time and check its usability problems in order to enhance usability of governmental sites [109]. Nielsen's heuristics (1995) are the most commonly used checking approaches to evaluate usability. In our study, we applied Nielsen's heuristics (1995) to evaluate the three governmental websites mentioned above in order to identify their usability problems.

The current study is based on accomplishing three tasks, namely checking the usability of three governmental websites including the passport websites that consist of many tasks such as finding what document is needed to apply for a new passport, and applying for a new passport as well as printing the application form. The second task is e-government for citizens and includes many tasks such as finding the required documents to lodge complaints about particular problems, submitting complaints regarding university admissions to the Ministry of Higher Education and Scientific Research, entering obtained codes and opening results pages for a problem, changing a phone number on a personal information page, adding a new phone number on a personal information page and changing a password.

The third task pertains to national identity and consists of many tasks including finding documents required for the application for and acquisition of a national identity card as well as printing the application.

3.2 Tasks

Our study includes three tasks which aim to evaluate the interfaces of the selected governmental websites. Our participants were asked to complete our task within a given time. The goal behind the tasks was to have our participants visit every page of the given websites and perform many of the functions available on those websites.

3.3 Participants

The participants in our study were postgraduate Iraqi students studying at different Turkish universities. We reached them in order to participate in our study and accomplish the tasks mentioned previously. Then, they would evaluate each of the websites. The number of participants in this study was 30. The evaluation questions are shown in Appendix A. The demographic information of our participants, including gender, is shown in Table 8.

Table 8: Gender of participants

	Frequency	Percent
Male	22	73.3
Female	8	26.7
Total	30	100.0

Table 8 shows the gender of the participants who participated in our survey. 73.3 percent of the participants were male and 26.7 percent were female. Furthermore, in terms of education level, all of our participants were students and studying for their master and doctorate degree at different Turkish universities. The participants were students whose ages ranged from 25 to 37 years.

3.4 Procedure and Instruments

Our evaluation form, as shown in Appendix A, includes nineteen items. The items of our survey were derived from Tullis and Stetson [111]. Our survey instrument used two Likert scale types, namely 5-point scales to measure the usability of selected governmental websites. These scales included *strongly disagree, disagree, neutral, agree* and *strongly agree*. Prior to starting the tasks, our participants were given information about the goal of this study and details about the evaluation criteria and the instructions to be followed through the evaluation process. We informed our participants about the usability heuristics and asked them to think out loud throughout the evaluation. Each of our three tasks were performed separately. We observed the accomplishment of the tasks and took some notes during the evaluation process. The average time taken for each task was approximately 30 minutes. The demographic information of each of the participants was completed after the evaluation process.

3.5 The Evaluated Websites

In our study, we evaluated the following three websites for their usability:

Passport(http://eservice.iraqinationality.gov.iq/pssservice_ara/start.swe?SWECmd=Start&SWEHo=eservice.iraqinationality.gov.iq&SWECmd=Start&SWEHo=eservice
.iraqinationality.gov.iq)

E-Government of the Citizen (www.ci.iq)

National Identity (http://www.nid-moi.gov.iq/)

CHAPTER FOUR

RESULTS AND ANALYSIS

The main goal of this study is to evaluate usability problems on many Iraqi governmental websites using Nielsen's heuristics evaluation. 30 subjects for three selected websites participated in this usability evaluation study. After conducting the tasks, the participants were asked to complete the forms. The data are analyzed in detail in the following sections.

4.1 Results and Analysis

1. Satisfaction

The effect of website on satisfaction was significant, F(2,58) = 15.49, p < .001. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that satisfaction in ID website was higher than satisfaction in EG, t(29) = -6.29, p < .001. Satisfaction in Passport website was higher than satisfaction in EG website, t(29) = 2.98, p = .006. Satisfaction in ID website was higher than satisfaction in passport website, t(29) = -2.28, p = .03 as shown in Table 9.

Table 9: Descriptive statistics on satisfaction

Descriptive Statistics			
	Mean	Std. Deviation	N
Satisfaction in Passport website	3.0333	0.71840	30
Satisfaction in EG website	2.4667	0.68145	30
Satisfaction in ID website	3.4667	0.73030	30

It is clear in Table 9 that the satisfaction in ID website was higher than both satisfaction in Passport and EG website respectively. In addition, the satisfaction in passport website was higher than satisfaction in EG website.

2. Simplicity

The effect of website on simplicity was significant, F(2, 58) = 20.99, p < .001. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that simplicity in ID website was higher than simplicity in EG, t(29) = -6.53, p < .001. Simplicity in Passport website was higher than simplicity in EG website, t(29) = 4.88, p < .001. Simplicity in ID website was higher than simplicity in Passport website, t(29) = -1.23, p = .229 as shown in Table 10.

Table 10: Descriptive statistics on simplicity

Desc	riptive Statistics		
	Mean	Std. Deviation	N
Simplicity in Passport website	3.3667	0.80872	30
Simplicity in EG website	2.5000	0.73108	30
Simplicity in ID website	3.6000	0.73108	30

Table 10 shows that simplicity in Passport website was higher than the simplicity of ID and EG websites. Moreover, the simplicity in ID website was higher than the simplicity of EG website.

3. Effectiveness

The effect of website on effectivity was significant, F(2, 58) = 9.97, p < .001. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that effectively in ID website was higher than effectively in EG, t(29) = -5.22, p < .001. Effectively in passport website was higher than Effectively in EG website, t(29) = 2.76, p < .010. Effectively in ID website was higher than effectively in Passport website, t(29) = -1.19, p = .243 as illustrated in Table 11.

Table 11: Descriptive statistics on effectiveness

Descriptive Statistics

	Mean	Std. Deviation	N
Effectiveness in Passport website	3.2000	0.88668	30
Effectiveness in EG website	2.6000	0.72397	30
Effectiveness in ID website	3.4333	0.77385	30

It is clear from Table 11 that is the effectivity in ID website was higher than the effectivity in Passport and EG websites. As well as, it is clear form Table 11 that is the effectivity of Passport website was higher than the effectivity in EG website.

4. Reaction Time

The effect of website on reaction time was significant, F(2, 58) = 4.15, p = .021. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that reaction time in ID website was higher than reaction time in EG, t(29) = -3.32, p = .002. Reaction time in Passport website was higher than reaction time in EG website, t(29) = 1.72, p = .97. Reaction time in ID website was higher than reaction time in Passport website, t(29) = -.84, p = .407 (See Table 12)

Table 12: Descriptive statistics on reaction time

Descriptive Statistics

	Mean	Std. Deviation	N
Reaction Time in Passport website	3.2333	0.85836	30
Reaction Time in EG website	2.8333	0.74664	30
Reaction Time in ID website	3.4000	0.81368	30

If we look to Table 12, we can clarify that reaction time in EG website was higher than reaction time of both ID and Passport websites. Furthermore, reaction time in ID website was higher than reaction time in Passport website as stated by the participants of our survey.

5. Efficiency

The effect of website on efficiency was significant, F(2, 58) = 3.73, p = .030. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that efficiently in ID website was higher than efficiently in Passport, t(29) = -2.92, p = .007. Efficiently in Passport website was higher than efficiently in EG website, t(29) = -1.51, p = .142. Efficiently in ID website was higher than efficiently in EG website, t(29) = 1.10, p = .281 (See Table 13).

 Table 13: Descriptive statistics on efficiently

Descriptive Statistics

	Mean	Std. Deviation	N
Efficiency in Passport website	3.0000	0.69481	30
Efficiency in EG website	2.8000	0.92476	30
Efficiency in ID website	3.3000	0.79438	30

Table 13 clarifies that efficiency in ID website was higher than efficiency of Passport and EG websites respectively. In addition, efficiency in Passport website was higher than efficiency EG website.

6. Comfort

The effect of website on comfort was significant, F(2, 58) = 5.97, p = .004. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that comfort in ID website was higher than comfort in Passport, t(29) = -4.04, p = .001. Comfort in passport website was higher than comfort in EG website, t(29) = -2.72, p = .011. Comfort in EG website was higher than comfort in ID website, t(29) = .304, p = .763 (See Table 14)

Table 14: Descriptive statistics on comfort

Descriptive Statistics

	Mean	Std. Deviation	N
Comfort in Passport website	2.8333	0.94989	30
Comfort in EG website	2.7667	0.81720	30
Comfort in ID website	3.3667	0.96431	30

If we look to Table 14, we can see that comfort in ID website is higher than comfort of both EG and Passport websites. Moreover, comfort in Passport website is higher than comfort in EG website.

7. Easiness

The effect of website on ease of use was significant, F(2, 58) = 2.46, p = .094. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that easiness in EG website was higher than easiness in passport, t (29) = -2.15, p = .040. Easiness in ID website was higher than easiness in passport website, t(29) = -1.61, p = .118. Easiness in ID website was higher than easiness in EG website, t(29) = -.757, p = .455 (See Table 15)

Table 15: Descriptive statistics on easiness

Descriptive Statistics

	Mean	Std. Deviation	N
Easiness in Passport website	2.9000	0.71197	30
Easiness in EG website	3.0667	0.90719	30
Easiness in ID website	3.3333	0.88409	30

Table 15 illustrates that it is easy to use ID website more than easy of using both EG and passport websites respectively. Also, it is easy to use EG website than Passport website.

8. Productiveness

The effect of website on productiveness was significant, F(2, 58) = 9.41, p < .001. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that productiveness in ID website was higher than productiveness in passport, t(29) = -4.94, p < .001. Productiveness in passport website was higher than EG website, t(29) = -2.63, p = .014. Productiveness in ID website was higher than EG website, t(29) = 1.47, p = .153 (See Table 16).

 Table 16: Descriptive statistics on Productive Quickly

Descriptive Statistics

	Mean	Std. Deviation	N
Productiveness in Passport website	2.9333	0.94443	30
Productiveness in EG website	2.6333	0.80872	30
Productiveness in ID website	3.4333	0.89763	30

If we look into Table 16, we can see that productiveness of ID was higher for both EG and Passport websites respectively. In addition, productiveness for Passport website is higher than EG websites.

9. Clearness of Error Messages

The effect of website on clearness of error messages was significant, F(2, 58) = 5.342, p = .007. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that clearness of error messages in ID website was higher than clearness of error messages in EG, t(29) = -3.67, p < .001. Clearness of error messages in passport website was higher than in EG website, t(29) = 1.93, p = .063. Clearness of error

messages in ID website was higher than clearness of error messages in Passport website, t(29) = -1.06, p = .30 (See Table 17)

Table 17: Descriptive statistics on clearness of error messages

Descriptive Statistics

	Mean	Std. Deviation	N
Clearness of Error Messages in Passport website	3.1667	0.83391	30
Clearness of Error Messages in EG website	2.7667	0.67891	30
Clearness of Error Messages in ID website	3.3667	0.92786	30

Table 17 clarifies that clearness of error messages in ID website was higher than clearness of error messages of both EG and Passport websites respectively. Moreover, clearness of error messages in Passport website was higher than clearness of error messages EG website.

10. Recovery

The effect of website on recovery was significant, F (2, 58) = .304, p = .586. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that ease of recovery in EG website was higher than ease of recovery in ID, t(29) = -1.313, p = .20. Ease of recovery in ID website was higher than ease of recovery in passport website, t(29) = -.641, p = .526. Ease of recovery in EG website was higher than n ID website, t(29) = -.250, p = .805 (See Table 18).

Table 18: Descriptive statistics on easy of recovery

Descriptive Statistics

	Mean	Std. Deviation	N
Recovery in Passport website	3.2000	0.80516	30
Recovery in EG website	3.6333	3.74611	30
Recovery in ID website	3.4667	0.97320	30

Table 18 shows that recovery in EG website was higher than recovery of both ID and Passport websites respectively. Also, recovery in ID website was higher than recovery in Passport website as stated by the participants of our survey.

11. Clearness of Information

The effect of website on clearness of information was significant, F (2, 58) = 7.27, p = .002. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that information clear in ID website was higher than information clear in EG, t(29) = -4.17, p < .001. Information clear in passport website was higher than information clear in EG website, t(29) = 2.236, p = .033. Information clear in ID website was higher than information clear in Passport website, t(29) = -1.31, p = .199 (See Table 19)

Table 19: Descriptive statistics on Information Clear

Descriptive Statistics

	Mean	Std. Deviation	N
Clearness of Information in Passport website	3.1667	0.83391	30
Clearness of Information in EG website	2.6667	0.80230	30
Clearness of Information in ID website	3.4333	1.00630	30

Table 19 clarifies that information in ID website is clearer than information in both EG and Passport websites respectively. As well as, information in Passport website is clearer than information in EG website.

12. Easiness to Find Needed Information

The effect of website on easiness to find needed information was significant, F(2, 58) = 5.286, p = .008. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that easiness to find needed information in ID website was higher than easiness to find needed information in EG, t(29) = -3.75, p = .001. Easiness to find needed information in passport website was higher than easiness to find needed information in EG website, t(29) = 1.79, p = .083. easiness to find needed information in Passport website was higher than easiness to find needed information in ID website, t(29) = 1.27, p = .213 (See Table 20)

Table 20: Descriptive statistics on easiness to find needed information

Descriptive Statistics

	Mean	Std. Deviation	N
Easiness to Find Needed Information in Passport website	3.4000	1.00344	30
Easiness to Find Needed Information in EG website	3.0000	0.69481	30
Easiness to Find Needed Information in ID website	3.7000	1.05536	30

Table 20 shows that easiness to find needed information in ID website is better than easiness to find needed information in both EG and Passport websites respectively. Moreover, easiness to find needed information in Passport website is better than easy to easiness to find needed information in EG website as clarified by the participants of our survey.

13. Easiness to Understand Information Provided

The effect of website on easiness to understand information provided was significant, F(2, 58) = 9.65, p < .001. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that easiness to understand information provided in ID website was higher than easiness to understand information provided in EG, t(29) = -4.10, p < .001. Easiness to understand information provided in passport website was higher than easiness to understand information provided in EG website, t(29) = 2.64, p = .013. Easiness to understand information provided in ID website was higher than easiness to understand information provided in Passport website, t(29) = -1.87, p = .071 (See Table 21)

Table 21: Descriptive statistics on Easiness to Understand Information Provided **Descriptive Statistics**

	Mean	Std. Deviation	N
Easiness to Understand Information	3.3000	0.79438	30
Provided in Passport website			
Easiness to Understand Information	2.8667	0.77608	30
Provided in EG website			
Easiness to Understand Information	3.6000	0.81368	30
Provided in ID website			

It is clear from Table 21 that it is easiness to understand information provided in ID website than easiness to understand information provided in both Passport and EG websites. As well as, easiness to understand information provided in passport website is better than easiness to understand information provided in EG website.

14. Easiness to Complete Work

The effect of website on easiness to complete work was significant, F(2, 58) = 7.50, p < .001. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that easiness to complete work in ID website was higher than easiness to complete work in EG, t(29) = -4.026, p < .001. Easiness to complete work in passport

website was higher than easiness to complete work in EG website, t (29) = 2.05, p = .050. Easiness to complete work in ID website was higher than easiness to complete work in Passport website, t (29) = -1.72, p = .095 (See Table 22)

Table 22: Descriptive statistics on Easiness to Complete Work

Descriptive Statistics

	Mean	Std. Deviation	N
	2 2222	0.071.42	20
Easiness to Complete Work in	3.2333	0.97143	30
Passport website			
Essings to Complete Work in EC	2 9222	0.01207	30
Easiness to Complete Work in EG	2.8333	0.91287	30
website			
Easiness to Complete Work in ID	3.5333	0.89955	30
	3.3333	0.67733	30
website			

Table 22 shows that easiness to complete work in ID website is higher that easiness to complete work in both Passport and EG websites. Moreover, easiness to complete work in passport website is higher than easiness to complete work in EG website according to the point of view of our sample.

15. Clearness of Organization of Information

The effect of website on clearness of organization of information was significant, F (2,58) = 3.636, p = .033. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that clearness of organization of information in ID website was higher than clearness of organization of information in passport, t (29) = -2.98, p = .006. Clearness of organization of information in passport was higher than clearness of organization of information in EG website, t (29) = -1.31, p = .199. Clearness of organization of information in ID website was higher than clearness of organization of information in EG website, t (29) = 1.28, p = .209 (See Table 23)

Table 23: Descriptive statistics on Clearness of Organization of İnformation **Descriptive Statistics**

			Mean	Std. Deviation	N
Clearness o	of Organization	of	3.1667	1.14721	30
Information in	Passport website				
Clearness o	of Organization	of	2.8333	0.94989	30
Information in	EG website				
Clearness o	of Organization	of	3.4333	1.00630	30
Information in	ID website				

If we look to Table 23, we can see that clearness of organization of information in ID website is higher than clearness of organization of information in passport website and EG website respectively. Moreover, clearness of organization of information in passport website is higher than clearness of organization of information in EG website according to the point of view of our participants.

16. Pleasantness of the Interface

The effect of pleasantness of the interface was significant, F (2, 58) = 5.41, p = .007. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that pleasantness of the interface in ID website was better than pleasantness of the interface in EG, t(29) = -2.72, p < .011. Pleasantness of the interface in passport website was better than pleasantness of the interface in EG website, t(29) = 2.44, p = .021. Pleasantness of the interface in ID website was better than pleasantness of the interface in Passport website, t(29) = -.722, p = .476 (See Table 24).

Table 24: Descriptive statistics on pleasantness of the interface

Descriptive Statistics

	Mean	Std. Deviation	N
Pleasantness of the Interface in	3.2000	0.76112	30
Passport website			
Pleasantness of the Interface in EG website	2.7667	0.77385	30
website			
Pleasantness of the Interface in ID	3.3000	1.05536	30
website			

Table 24 illustrates that pleasantness of the interface in ID website is better than pleasantness of the interface of both passport and EG websites respectively. Moreover, the pleasantness of the interface in passport website is better than pleasantness of the interface in EG websites as stated by the participants of our survey.

17. Likeness

The effect of likeness was significant, F (2, 58) = 4.80, p = .012. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that likeness in ID website was higher than likeness in EG, t(29) = -2.52, p = .017. Likeness in passport website was higher than likeness in EG website, t(29) = 1.83, p = .078. Likeness in ID website was higher than likeness in Passport website, t(29) = -1.756, p = .090 (See Table 25)

Table 25: Descriptive statistics on Likeness

Descriptive Statistics

	Mean	Std. Deviation	N
Likeness in Passport website	3.1333	0.93710	30
Likeness in EG website	2.7667	.77385	30
Likeness in ID website	3.3667	1.09807	30

It is clear from Table 25 that likeness in ID website is better than likeness in both passport and EG websites respectively. In addition, likeness in passport website is better than likeness in EG website according to the point of view of our sample.

18. Having Expected Functions and Capabilities

The effect of having expected functions and capabilities was significant, F(2, 58) = 11.88, p < .001. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that having expected functions and capabilities in ID website was higher than having expected functions and capabilities in EG, t(29) = -4.40, p < .001. Having expected functions and capabilities in passport website was higher than having expected functions and capabilities in EG website, t(29) = 2.97, p = .006. Having expected functions and capabilities in ID website was higher than having expected functions and capabilities in Passport website, t(29) = -2.16, p = .039 (See Table 26)

Table 26: Descriptive statistics on Having Expected Functions and Capabilities **Descriptive Statistics**

	Mean	Std. Deviation	N
Having Expected Functions and Capabilities in	2.9000	0.88474	30
Passport website			
Having Expected Functions and Capabilities in	2.4333	0.77385	30
EG website			
Having Expected Functions and Capabilities in	3.2333	1.10433	30
ID website			

If we look into Table 26, we can see that having expected functions and capabilities for ID website is better than those existed in both EG and ID websites. In addition, having expected functions and capabilities in passport website is better than having expected functions and capabilities in EG website as stated by the sample of our survey.

19. Overall Satisfaction

The effect of overall satisfaction was significant, F(2, 58) = 20.69, p < .001. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that overall satisfaction in EG website was higher than overall satisfaction in ID, t(29) = -6.23, p < .001. Overall satisfaction in passport website was higher than overall satisfaction in EG website, t(29) = 5.81, p < .001. Overall satisfaction in ID website was higher than overall satisfaction in Passport website, t(29) = -1.27, p = .214 (See Table 27.

Table 27: Descriptive statistics on Overall Satisfaction **Descriptive Statistics Overall Satisfaction**

	Mean	Std.	N
		Deviation	
Overall Satisfaction in Passport website	3.1667	0.83391	30
Overall Satisfaction in EG website	2.4333	0.72793	30
Overall Satisfaction in ID website	3.4000	1.06997	30

If we look into Table 27, we can see that our participants are overall satisfaction with ID websites more than their overall satisfaction with both passport and EG websites respectively. Moreover, they overall satisfaction with Passport website more than their overall satisfaction with EG website.

20. Success

The effect of website on success was significant, F(2, 58) = 261.00, p < .001. Paired samples t-tests were conducted for a post-hoc analysis. The result suggested that success in ID website was higher than success in passport website, t(29) = 16.16, p < .001. Success in passport website was higher than success in EG website, t(29) = 16.16, p < .001. Success in ID website was higher than success in EG website, t(29) = 16.16, p < .001. Success in ID website was higher than success in EG website, t(29) = -2.15, p = .038 (See Table 28)

 Table 28: Descriptive statistics on Success

Descriptive Statistics

	Mean	Std. Deviation	N
Success in Passport website	3.0333	0.71840	30
Success in EG website	2.4667	0.68145	30
Success in ID website	3.4667	0.73030	30

If we look into Table 28, we can find that success in ID website is higher than success in both Passport and EG websites respectively. Moreover, success in passport website is higher than success in EG website.

Table 29: Descriptive statistics on time consumed

Descriptive Statistics

	N	Mean	Std. Deviation
Time in Task1 of Passport website	30	90.4000	6.89628
Time in Task2 Passport website	27	362.9630	5.23657
Time in Task2 EG website	30	393.3667	10.64630
Time in Task3 EG website	30	34.6333	4.41380
Time in Task5 EG website	30	62.5000	7.55098
Time in Task2 ID website	30	177.6000	14.60420

CHAPTER FIVE

DISCUSSION

In the previous chapter, we analyzed our study results by using the Statistical Program for Social Sciences (SPSS). At this chapter, we will discuss the results of our study.

As we clarified earlier, our study included three main tasks. The first task is on the Passport website and includes finding what documents are needed to apply for a new passport (normal) and a new passport and to print out the application form. The second task is about the E-Government website and consists of the following sub-tasks: find the required documents to provide a complaint about a particular problem, submit a complaint regarding the admission for the university to the Ministry of Higher Education and Scientific Research, enter the code that is got and open the result page of the problem, change your phone number in your personal information page, add a new phone number in your personal information page and change your password. The last task is on the National identity website and includes finding the documents required to obtain the national identity and applying for a national ID with print demand.

1. Satisfaction

The results suggested that the effect of website was significant on satisfaction. The satisfaction was highest for ID website and lowest for EG website. There may be several reasons for these results. It may be easier for the participants to do the tasks in ID website. However, it may be hard to the tasks in EG websites. This may be due to the reason that the website color is not suitable for all ages and experiences or the website may not work in multiple screen sizes.

2. Simplicity

Our results suggested that effect of website was significant on simplicity. Obtained results suggested that simplicity was highest for passport website and lowest for EG website. This means that our participants find simplicity when performing tasks in passport website and they face difficulty when they perform tasks in EG website. Therefore, it is hard for them to deal with EG website. This may be caused by many reasons such as the website interface and menus have not been designed simply. In addition, fulfillment of the tasks may require repeated questions and procedures that are not easy to understand.

3. Effectiveness

The results suggested that effect of website was significant on effectiveness. The highest effectiveness was on ID website and lowest on EG website. This result suggests that participants can use and perform tasks by using ID website effectively. Nevertheless, they may find difficulty when they perform tasks by using EG website. This may be due the fact that the EG website did not accept uploaded documents and images in multiple formats.

4. Reaction Time

The results of our study suggested that effect of website was significant on reaction time. The highest reaction time was for EG websites and lowest for passport website. Participants can perform tasks quickly through EG website. However, they may perform their tasks slowly with passport website. It takes more time for the passport website to load because thousands of people may apply for different issues at the same time.

5. Efficiency

The results suggested that effect of website was significant on efficiency. Highest efficiency was on ID website and EG is the website with lowest efficiency. This means that participants can perform their tasks efficiently by using ID website. Though they may face inefficiency problem when perform their tasks by using EG website. This problem may be caused by many factors inability to upload different format of

documents and images in the EG website. In addition, this website may not operate efficiently all the time.

6. Comfort

Our results suggested that effect of website was significant on comfort. Website with highest comfort was ID website and website with lowest comfort was EG website. This denotes that our participants can perform their tasks in comfort by using ID website. Nevertheless, they may face discomfort when they use EG website. The type of questions asked by the website may not be simple and understood by the users. In addition, the website may ask detailed information and these information may cause discomfort on users.

7. Easiness

The results suggested that effect of website was significant on easiness. ID website is the websites that is the best website in terms of easiness of use and passport website is most difficult website in terms easiness of use. This means that our participants can easily work on ID website. Nevertheless, they may face difficulty while using passport website. Difficulty can be caused by many issued such as easiness to navigate and to reach the required information.

8. Productiveness

The study results suggested that effect of website was significant on productiveness. Website with highest level of productiveness is ID website and website with lowest productiveness is the EG website. This result refers that our participants found unproductivity when using EG website. This unproductivity may be caused by many reasons such as the website may not support full transaction accomplishment or it may require attendance of each applicant in order to complete the transaction. In addition, the EG website may need expert users to finish some specific transactions.

9. Clearness of Error Messages

The results suggested that effect of website was significant on clearness. Our study results clarified that the website with highest level of clearness is the ID website and

websites with lower clearness is the EG website. This denotes that information and tasks in EG website is not clear when compared with ID and passport websites. The reason of this problem may be that the website may refuse transactions of users without clear error messages.

10. Recovery

Our study results clarified that effect of website was significant on recovery. It is clarified that website with highest level of recovery is the EG website and website with lowest level of recovery is the passport website. This means that participants' tasks in passport website cannot be recovered easily. EG, website may not have enough undo operations to have the previous state without damaging the current state.

11. Clearness of Information

The study results suggested that effect of website was significant on clearness of information. Results of our study showed that the website with highest level of clearness is the ID website and the website with lowest clearness of information is the EG website. This result suggested that participants face difficulty to interpret information and procedures in EG website. EG website may ask from users for information and documents that are not easy to understand.

12. Easiness to Find Needed Information

Our study results suggested that effect of website was significant on easiness to find needed information. Our study results found that website with highest easiness to find need information is the ID website and the website with lowest easiness in finding needed information is the EG website. This means that participants have problems and difficulties in finding needed information in EG website. The EG website has huge information and it requires too much time for any person to find specific information. This makes the website practically inefficient and ineffective.

13. Easiness to Understand Information Provided

Results of our study suggested that the effect of website was significant on easiness to understand information provided. The study results found that website with the highest level of easiness to understand information provided is the ID website and website with the lowest level of easiness to understand information provided is the EG website. This may due to difficulty to interpret information generated from the website and difficulty to fill specific fields in order to accomplish the transactions.

14. Easiness to Complete Work

Study results suggested that the effect of website was significant in easiness to complete work. Website with the highest easiness to complete work is the ID website and the website with the lowest easiness to complete work is the EG website. This shows that our participants find difficulty to complete work when using EG website. This is because of huge information in the EG website and too much time needed to find the required information. This makes the website practically inefficient and ineffective.

15. Clearness of Organization of Information

Results of our study suggested that the effect of website was significant in clearness of organization of information. Our study results revealed that the website with the highest level of clearness is the ID website and the website with the lowest level of clearness is the EG website. This means that participants found difficulty in clearness of information when using EG website. Information in EG website may not be organized and thus, person may face difficulties to find needed information.

16. Pleasantness of the Interface

Our study results suggested that the effect of website was significant in pleasantness of the interface. The website with the highest level of pleasantness of the interface is the ID website and the website with the lowest pleasantness of the interface is the EG website. This result shows that participants are not pleasant of the interface when they perform tasks in EG website. This may be due to the website colors and font size. Font type may not be suitable for all types of users and users may face difficulty when they browse the website and search for specific information.

17. Likeness

The results of the study suggested that the effect of website was significant on likeness. According to the results of our study, the website with highest likeness is the ID website and the website with lowest likeness is the EG website. This refers that our participants do not like EG website when they perform their tasks and this may be, font type and font size of the website.

18. Having Expected Functions and Capabilities

Results of our study suggested that effect of website was significant on having expected functions and capabilities. The website with highest functions and capabilities is the ID website and the website with lowest functions and capabilities is the EG website. This means that EG website include little functions and capabilities.

19. Overall Satisfaction

Our study suggested that the effect of website was significant on overall satisfaction. The website that has the highest overall satisfaction is the ID website and the website having lowest level of overall satisfaction is the EG website. This means that our participants are not satisfied with EG website when they performed their tasks.

20. Success

Study results suggested that the effect of website was significant on success. The website with highest level of success is the ID website and the website with lowest level of success is the EG website. This result refers that our participants cannot perform well their tasks by using the EG website.

5.2 Limitations of the Study

In this study, we tried to analyze the usability of three important governmental websites in Iraq. The analysis process for those sites are accomplished by taking the views of our sample of students who study in different universities in Turkey. Most of those students work in important governmental positions and have experience in information technology. Restrictions accompanied with our study are similar to those accompanied with survey studies. In addition, due to the fact that the researcher is in Turkey the number of participants at this study is only 30 participants. Thus, limited sample size is another limitation of the study.

5.3 Implications for Practice

Results obtained from this study has an important implication on different countries especially developing countries, which need to decrease usability problems, exist in their governmental websites. Our results can be considered as a base for comprehensive operations in order to develop usability of governmental websites because most of our participants stated by the emergence of problems associate with usability of the sites. Therefore, these sites need to continuous development in order to promote and increase their benefits. In order to overcome the usability problems in the governmental sites, we reach the suggestions as follows:

- Develop a time plan in order to promote usability of current governmental websites.
- Design a website in order to be usable by all levels and experiences of people.

5.4 Implications for Research

Since our study is exploratory and interpretive, thus, it provides many opportunities for future studies in terms of usability problems of governmental and non-governmental websites. Future studies at the current field may depend on our results and check the usability problems that are faced. In addition, it is possible to employ different research methodologies to answer the same research questions. Our results may be compared with results of future researches.

CHAPTER SIX

CONCLUSION

Recently, the importance of electronic government websites has increased markedly in order to provide electronic services to citizens regardless of their age or cognitive and physical ability. Guaranteeing usability and ease of use for any website for all citizens is a basic goal for any governmental website. In this study, we tested the usability of three governmental websites, namely Passport, E-Government of the Citizen and National Identity. Each website was tested with many tasks: the Passport website was tested with three tasks, namely finding what application documents are required for a new passport (normal), applying for a new passport and printing the application form. The second website, E-Government of the Citizen, was tested with six tasks, namely finding the required documents to lodge complaints about a particular problem, submitting complaints regarding university admission to the Ministry of Higher Education and Scientific Research, entering codes acquired by users and opening the results page of users' problems, changing phone numbers in personal information pages, and changing passwords. The third task, relating to National Identity website, consisted of two tasks, namely finding documents required to obtain a national identity card and applying for a national identity card and printing the application.

The results were obtained from a number of participants, all of whom are postgraduate Iraqi student studying at different Turkish universities. The participants stated that our website suffered from many usability problems in addition to factors such as time being consumed in accomplishing specific tasks and the flexibility of the website. Therefore, governmental authorities, administrators and developers must focus on solving usability problems for these websites in order for these websites to be accessible by the highest number of citizens. In our study, we tested usability with a number of tasks and obtained important data associated with usability, which is a critical issue in the evaluation process of any website.

The main limitation of usability evaluation in our study was using only tasks that we mentioned earlier. In a future study, our target groups will include the disabled and elderly from Iraq in order to evaluate the usability of government websites in Iraq. In addition to heuristics evaluation, many usability evaluation approaches can be used to offer a better understanding of usability problems.

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CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: ZEAIN, Abdulrahman

Date and Place of Birth: 25 April 1991, ALANBAR

Marital Status: Single

Phone: +90 5436933031

Email: abdulrahman2015pro1991@gmail.com

EDUCATION

Degree	Institution	Year of Graduation
M.Sc.	Çankaya University	2019
B.Sc.	Computer Science and Information Technology/ University of Anbar	2016
High School	AL-Zaeton High School	2010

WORK EXPERIENCE

Year	Place	Enrollment		
2014	Western Engineering Projects,	Lab Technician in		
2014	University of Anbar	Computer Engineering Lab		

FOREIGN LANGUAGES

Advanced English, Beginner Turkish

APPENDIX A

QUESTIONNAIRE

Usability Satisfaction Questionnaires

1. Overall, I am satisfied with how easy it is to	o use this system.	
Strongly Agree Agree	Neutral Disa	gree Strongly disagree
2. It is simple to use this system.		
Strongly Agree Agree	Neutral Disa	gree Strongly disagree
3. I can effectively complete my work using t	his system.	
Strongly Agree Agree	Neutral Disa	gree Strongly disagree
4. I am able to complete my work quickly using	ng this system.	
Strongly Agree Agree	Neutral Disa	gree Strongly disagree
5. I am able to efficiently complete my work to	using this system.	
Strongly Agree Agree	Neutral Disa	gree Strongly disagree
6. I feel comfortable using this system.		
Strongly Agree Agree	Neutral Disa	gree Strongly disagree
7. It was easy to learn to use this system.		
Strongly Agree Agree	Neutral Disa	gree Strongly disagree
8. I believe I became productive quickly using	g this system.	
Strongly Agree Agree	Neutral Disa	gree Strongly disagree
9. The system gives error messages that clearly	ly tell me how to fix proble	ems.

	Strongly Agree	A	Agree		Neutral		Disagree		Strongly	disagree
10.	Whenever I make	e a mis	take us	ing the	e system,	I reco	over easily	and o	quickly.	
	Strongly Agree	I A	Agree		Neutral		Disagree		Strongly	disagree
11.	The information ((such a	ıs on-lii	ne helj	o, on-scre	een me	essages an	d othe	er	
docı	umentation) prov	ided w	ith this	syster	m is clear	î .				
	Strongly Agree	A	Agree		Neutral		Disagree		Strongly	disagree
12.	It is easy to find t	he info	ormatio	n I ne	ed.					
	Strongly Agree	A	Agree		Neutral		Disagree		Strongly	disagree
13.	The information j	provide	ed with	the sy	stem is e	easy to	understar	nd.		
			A		NT 4 1	4	p. [G. 1	••
	Strongly Agree	_	Agree		Neutral	Ш	Disagree		Strongly	disagree
14.	The information i	is effec	ctive in	helpir	ng me con	mplete	e my work	•		
	Strongly Agree		Agree		Neutral		Disagree [Strongly	disagree
15.	The organization	of info	ormatio	n on t	he systen	1 scree	ens is clear	r.		
	Strongly Agree	A	Agree		Neutral		Disagree		Strongly	disagree
16.	The interface of t	his sys	tem is	pleasa	nt.					
17	Strongly Agree I like using the in		Agree		Neutral		Disagree [Strongly	disagree
1/.	Tike using the in	nerrace	or uns	sysic	111.					
	Strongly Agree		Agree		Neutral		Disagree [Strongly	disagree
18.	This system has a	all the i	tunctioi	ns and	capabili	ties I e	expect it to	have	?.	
19 (Strongly Agree Overall, I am sati		Agree	S syste	Neutral		Disagree		Strongly	disagree
	Strongly Agree	A	Agree		Neutral		Disagree		Strongly	disagree

Gender: Male Female
The Tasks (Passport)
1- Find what documents you need to apply for a new passport (normal).
2- Apply for a new passport and print out the application form.
The Tasks (E-Government of the citizen)
1- Find the required documents to provide a complaint about a particular problem.
2- Submit a complaint regarding the admission for the university to the Ministry of
Higher Education and Scientific Research.
3- Enter the code that you got and open the result page of your problem.
4- Change your phone number in your personal information page.
5- Add a new phone number in your personal information page.
6- Change your password
The Tasks (National Identity)
1- Find the documents required to obtain the national identity.

- 2- Apply for a national ID and print the demand.