

**ANALYZING THE ADMINISTRATIVE AND STAFF REQUIREMENTS OF E-
GOVERNMENT SERVICES AND PRIORITIZING THE DEPLOYMENT WITH
MODULAR DESIGN: IRAQI CORRECTION SERVICES CASE STUDY**

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ABSTRACT

ANALYZING THE ADMINISTRATIVE AND STAFF REQUIREMENTS OF E-GOVERNMENT SERVICES AND PRIORITIZING THE DEPLOYMENT WITH MODULAR DESIGN: IRAQI CORRECTION SERVICES CASE STUDY

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Iraqi Correction Services (ICS) is a department within the Ministry of Justice. Most services are provided through traditional paper and pen system. This system causes delays in service provision time and work over-load on ICS staff which translates into a high cost of service provision. Analysis of the collected data showed the priority should be given to the following services when automating ICS services: Requests of permission for official work, Sharing inmate status information, Rehabilitation services for released inmates, Requests for inmates' visits, Legal email services, Informatory services for inmate families, announcement of ICS responsibilities, Controlled and filtered email services between inmates and their families. The results of the analysis also point to the web-based service delivery as the most preferred user interface in automation of the services.

Keywords: E-government; Iraqi Correction Service; automation; modular design.

Öz

Irak Tutuklu Hizmetleri, Adalet Bakanlığı bünyesinde bir kurumdur. Bu kurumda hizmetlerin çoğu klasik kağıt-kalem sistemi ile verilmektedir. Bu çalışma şekli hizmet sunumunda zaman kaybına, kurum çalışanları üzerinde iş yükü yığılmasına sebep olmakta ve bütün bunlar da hizmet sunumunda yüksek maliyetlere neden olmaktadır. Tutuklu Hizmetleri kurumundaki süreçlerin otomasyonu için yapılan veri analiz çalışmalarının neticesinde öncelik verilecek hizmetler şunlardır: Resmi iş takibi için müsaade süreçleri, tutuklu durum bilgisinin paylaşımı, tutukluluk durumu sona eren kişilerin rehabilitasyon süreçlerinin takibi, tutuklu ziyaret izni süreci, resmi e-posta hizmeti, aile bilgilendirme hizmetleri, kurum sorumluluklarının ilanı, tutuklular ve aileleri arasında kontrollü ve filtrelenmiş e-posta hizmeti. Analiz sonuçları aynı zamanda otomatik hizmet sunumunda daha çok web tabanlı arayüzlerin tercih edildiğine işaret etmektedir.

Anahtar Kelimeler: E-devlet; Irak Tutuklu Hizmetleri; Otomasyon; Modüler tasarım

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To who doses the cup empty to irrigate me drop of love, to who tried to give us a moment of happiness, to who reap the thorns from my way and paving me the way to the science, the big heart (my dear father).

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TABLE OF CONTENT

ABSTRACT	iv
Öz	v
ACKNOWLEDGMENTS	vi
TABLE OF CONTENT	vii
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF SYMBOLS AND ABBREVIATIONS	xiii
CHAPTER I	
INTRODUCTION	2
1. BACKGROUND	2
2. STATEMENT OF THE THESIS PROBLEM:	6
3. IMPORTANCE AND SIGNIFICANCE OF THE APPLICATION:.....	6
4. THESIS’S OUTLINE	7
CHAPTER II	
THE E-GOVERNMENT PHENOMENON	8
1. WHAT IS THE E-GOVERNMENT?.....	10
1.1. Definitions of E-government.....	10
1.2. Main Goals of E-governments	11
1.3. Stakeholders in E-government	11
2. TYPES OF E-GOVERNMENT APPLICATION	12
2.1. Government-to-Government G2G	12
2.2. Government-to-Citizen G2C	12
2.3. Government-to-Business G2B	13
2.4. Government-to-Employee G2E.....	13
2.5. Government-to-Nonprofit G2N.....	13
2.6. Nonprofit-to-Government N2G.....	13

2.7.	Citizen-to-Government C2G	13
2.8.	Business-to-Government B2G	14
3.	STAGES OF E-GOVERNMENT	15
3.1.	Layne and Lee's Study (Four Stages)	16
3.2.	UN-ASPA's Study (Five Stages)	18
3.3.	Schelin's Study	19
3.4.	Limitations of Layne and Lee's and UN-ASPA's Study	20
3.5.	Gartner Study (Four Stages)	20
3.6.	Moon's Study	21
4.	E-GOVERNMENT'S ARCHITECTURE	22
4.1.	The Enterprise Architecture EA	23
4.2.	Interoperability Frameworks (IA)	24
4.3.	Web Service Architecture	25
5.	The E-GOVERNMENT ADVANTEGES	25
5.1.	Government-to-Government advantages (G2G):	25
5.2.	Government to Citizen advantages (G2C)	26
5.3.	Government-to-business advantages (G2B)	26
6.	ACCEPTANCE OF E-GOVERNMENT SERVICES	27
CHAPTER III		
LITERATURE REVIEW		
		33
1.	IRAQ	33
2.	SAUDI ARABIA	36
3.	UGANDA	37
4.	TURKEY	37
5.	MALAYSIA	37
6.	OMAN	38
7.	UK	39

8.	USA	39
9.	KENYA	39
 CHAPTER IV		
	RESEARCH METHODOLOGY	40
	Introduction.....	40
1.	Research Approach	40
2.	Study Sample	40
3.	Research Hypothesis.....	41
3.1.	Whole sample	41
3.2.	ICS Administrators and Employees	41
3.3.	Other Governmental Employees	42
3.4.	Citizens	43
4.	Instrument	44
4.1.	Instrument development	44
4.2.	Instrument validation.....	45
5.	Statistical Analysis.....	45
 CHAPTER V		
	RESULTS	48
1.	Demographics	48
2.	Frequency of IT Usage	50
3.	User Perception of the Importance of Automation of ICS Services.....	52
4.	Technology Preferences.....	54
5.	Hypotheses Testing.....	56
5.1.	Whole sample	56
5.2.	ICS employees.....	61
5.3.	Other governmental employees.....	63
5.4.	Citizens	64

CHAPTER VI

DISCUSSION AND CONCLUSIONS65

- 1. Discussion.....65
- 2. Conclusions.....68

REFERENCES.....70

APPENDICES79

- 1. Appendix 1: Q1 ICS Employees.....79
- 2. Appendix 2: Q2 Other Governmental Employees.....82
- 3. Appendix 3: Q3 Citizens.....85

LIST OF TABLES

Table 1: Characteristics of the Different Types of E-Government [21].....	14
Table 2 The E-government Typology [27].....	19
Table 3: Advantages of E-government.....	27
Table 4: Summarized the literature that related with acceptance of e-governments services.	29
Table 5: Factors extracted from previous studies.....	30
Table 6: The higher repeated extracted factors.	31
Table 7: The higher repeated extracted factors definition.....	32
Table 8: Summary of the 3 questionnaires used in this study.....	44
Table 9: Demographic of the study sample.....	49
Table 10: Chi-square (χ^2) test results for the whole sample.....	50
Table 11: Frequency of IT usage in the study sample.....	51
Table 12: User perception of the importance of IT based automation of ICS services ranked in order of relative importance	53
Table 13: Preference ranking of automation platforms as reported by study participants	55
Table 14: Hypotheses test results for H1.....	58
Table 15: Hypotheses test results for H2.....	60
Table 16 Univariate correlation test results for H3.	61
Table 17: Univariate correlation test results for H4.	62
Table 18: Hypothesis test result for H5.....	63
Table 19: Hypothesis test results for H6.	64

LIST OF FIGURES

Figure 1: Pathway to e-Government in Iraq 2007-2010	4
Figure 2: Citizen e-Government in Iraq	4
Figure 3: Types of E-government	12
Figure 4: Stages of E-government	16
Figure 5 Dimensions and stages of the E-government.....	18
Figure 6: Moon's study stages.....	22
Figure 7: Age and gender distribution of respondents broken by ICS beneficiary category	48
Figure 8: Number of respondents frequently (>20 times/day) use various IT applications in the whole sample.....	51
Figure 9: Relative importance of automation of various ICS services as perceived by respondents in the whole sample.....	53
Figure 10: Preference ranking (median) of automation platforms as reported by study	55

LIST OF SYMBOLS AND ABBREVIATIONS

DOI	Diffusion of Innovation
E-commerce	Electronic commerce
E-government	Electronic government
E-governance	Electronic governance
ERM	Electronic records management systems
G2B	Government to business
G2C	Government to citizen
G2E	Government to employee
G2G	Government to government
G2N	Government to Nonprofit
ICS	Iraqi correction services
ICT	Information and communication technology
M-government	Mobile government
PKI	Public Key Infrastructure
SOA	Service Oriented Architecture
SSL	Secure Sockets Layer
TAM	Technology Acceptance Model
USAID	United States Agency for International Development
UTAUT	Uniform Theory of Acceptance and Use of Technology
XML	Extensible Markup Language

CHAPTER I

INTRODUCTION

1. BACKGROUND

Nowadays, we live in an advanced stage of knowledge and scientific progress in all of the life aspects. The populations of earth must benefit from technology, which is one of the results of the current progressive science, to change their lives for better.

The revolutions of information technology and communication techniques have been contributing virtually in removing the borders between countries, so the world has become a small village. For this reason, any events that take place in certain region on the earth can immediately affect the entire world by the information and communication technology (ICT). It is not surprising that the advanced technology also existed in the communication field and in the information displaying means such as live broadcast, modern telephone, mobile technologies, and world wide web.

During this phase, many restrictions have been canceled, the markets have been opened, and competition between companies has been increasing. The citizens tend to use computers and internet in their daily life and get electronic services from private sectors (e-commerce) [1]. The effect of modern technology in all life aspects has been enormously growing to the extent that it has played a major role in the introduction of significant changes concerning the provision of public services to the consumers in the public sector. Many terms have appeared, such as, E-government, E-governance, and intelligent government. In this context, the government in every county looks forward to applying E-government services in all of its transactions to ensure that it will provide its services to the citizens in an efficient and effective way.

The internet, that is one of the information and communication revolution achievements, provides an empower ability for the process of transiting the government agency from a bureaucratic paradigm that depends on standardization, departmentalization, and cost-efficiency, to an electronic government paradigm, which depends on coordinated network building, external cooperation, and consumer services [2].

E-government initiatives can achieve their goals after realizing that the world nowadays and its innovation requires a highly-advanced society. So, each government and its population are looking forward to including three main features to their society to make it a more developed one, and those features are: accountability, flexibility and good governance [3].

The Iraqi government, that is one of the developing countries governments, wants to benefit from the scientific progresses to serve its citizens and other public consumers' services by using ICT tools. At the end of the war in April 2003, Iraq needed too many efforts to reconstruct its infrastructure in different fields which have been destroyed during the war. In the technology field, the international community has assisted Iraq to reconstruct its technology infrastructure, and it also has helped its new government by transiting it gradually to what is called "E-government services."

In 2004, Italian government had assisted the Iraqi government to take place in ICT world society [4]. Following this initiative, many initiatives have occurred to develop the Iraqi electronic government project such as, the Iraqi Ministry of Science and Technology in cooperation with the United States Agency for International Development (USAID) that has established a strategy from 2007-2010. Planned pathway to e-government in Iraq which was developed in this initiative is shown in Figure 1 [5].

One of the most successful initiatives of E-government application in Iraq is the citizen E-government website that was achieved by the General Secretariat of the Ministers Council as shown in Figure 2. In this website, the citizen can write and send electronically a complaint that is related to an Iraqi ministry or an agency. The citizen will be provided with a transaction number to follow his request through the website. The next step, the citizen's request will be sent to related agency then the response will be sent back to citizen's E-mail or communicated to the citizen by telephone.

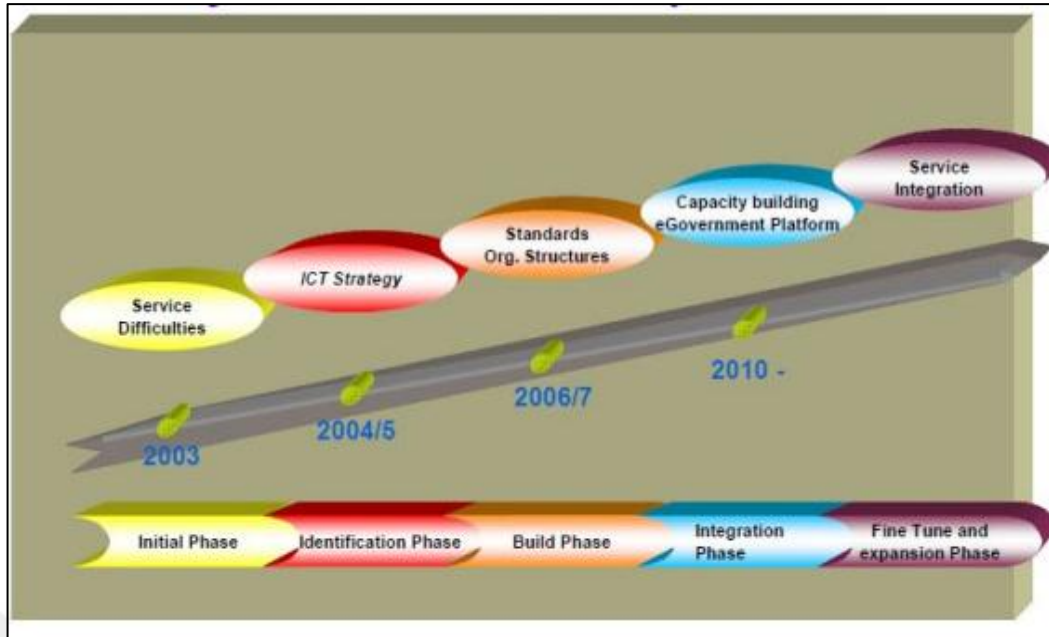


Figure 1: Pathway to e-Government in Iraq 2007-2010 [5]



Figure 2: Citizen e-Government in Iraq [7]

Iraqi correction services (ICS) is one of the agencies in the Ministry of Justice in Iraq. The ICS's main role can be expressed as to take care of the inmates, rehabilitate them during their stay in ICS, prepare them to be good citizens after the release, and help them to coexist with the community [8]. The ICS's responsibilities and the departmental organization have been published in official newspaper that is named "Alwaqayie" in number (4228) on 23.02.2012. Substantial responsibilities of ICS are listed below [9]:

- To publish ICS's events monthly.

- To prepare scientific studies of the phenomena that occur in the prisons and to study the methods of developing the performance of the ICS's staff.
- To communicate religious and ethical knowledge to inmates through the well-designed programs.
- To teach inmates how to read, write, and to encourage them to continue their education.
- To help ex-inmates to find the right jobs that suit their potentials.
- To pay attention to vocational training: to prepare training programs and courses in cooperation with the related authorities.
- To liaise with governmental authorities and non-governmental parties to provide social and psychological care for inmates.
- To handle inmate-affairs: imprisonment, release, and amnesty.

ICS service consumers can be categorized into four groups:

1. Inmates.
2. Inmates' family and citizens.
3. ICS's employee.
4. Other government agencies.

ICS benefits from some e-government applications to provide electronic services to other government agencies and vice versa (G2G) such as, the Criminal Justice Project [10] connected with the directorate-general for retirement [11]. There are some official emails for inquiries and for hot complaint forms which are provided to inmate's families, and to citizens in addition to other official emails which are provided to receive and send to/ or from other government agencies.

The Criminal Justice Project consists of a central database that is designed to exchange inmate-information between related ministries and agencies. The connection with directorate-general for retirement is to exchange the information about retired ICS employees.

The current e-government services in ICS are not at the level of what they were looking for; the majority of ICS services have not been automated so far, especially those services that are provided to inmates, inmate's family and citizens. The transition to e-government services in all of the ICS services is our noble goal, but, in

fact, it needs an expensive budget and a considerable effort. Although, directors of the ICS have planned the transition to e-government services such as, training the ICS's staff in Iraq or in abroad in order to use modern technology and to allocate the budget to purchase modern equipment which is necessary for the construction of the electronic infrastructures; however, these efforts are still not enough to meet the requirements for a successful transformation.

2. STATEMENT OF THE THESIS PROBLEM:

The declination that has affected the Iraq's entire budget and that has affected also the ICS's budget is due to many reasons: the first one, the Iraqi war on terrorism; it led to a significant conversion for a big part of the country's financial spending towards the military forces in order to rescue and liberate its cities from terrorists and to restore security in the area. The second one, the global decrease in the oil prices.

The urgency of applying E-government services in ICS and the current financial situation force the decision maker to determine the prioritization of ICS's services to automate it as a part of E-government functionality processes.

This study aims to develop an integrated e-government deployment model with a case study on ICS. The objective of the deployment model is to deliver ICS's services in an effective and an efficient way, and to enable the ICS's employees to satisfy the ICS service consumers' needs in a modern and a stylish way by using available ICT facilities. This new way of service delivery aims also to avoid problems that used to exist in the customary ways; the delay in time of responding to consumers, and the high amount of money that it costs. So, an integrated framework system has been studied to identify and prioritize the ICS services that will better be delivered via ICT means. Additionally, a transition plan which expedite efficient changeover for ICS is proposed as well.

3. IMPORTANCE AND SIGNIFICANCE OF THE APPLICATION:

This study will contribute in determining the fields and the requirements that are necessary for a successful transition to e-government services in various IC's departments. What are the challenges that may face this project and how to overcome these challenges? In the case, if the findings of this study will be applied in the ICS,

it will contribute in enhancing ICS services in an effective, accurate and a fast way. Furthermore, the installation of e-government services will contribute in combating administrative corruption, decreasing the processing time in routine procedures, and homogenizing the procedures in all ICS's departments across various provinces in Iraq. It also contributes in moving gradually the employees who work in offices to work in security. Finally, when ICS has a website on the internet, it shall give citizens, inmate's family, etc., the opportunity to have information about ICS'S services, to know the time that is suitable to visit inmate, or to just use the website to inquire about specific information. Yet there are a lot of advantages that just cannot all be listed here.

4. THESIS'S OUTLINE

This thesis consists of six chapters except the references and the appendices. The first chapter presents the introduction while the second one accounts for some basic concepts and definitions related to E-government applications. The third chapter contains a review of literature related to our studies. The fourth chapter explains the methodology and the tool (survey) developed for the study then comes the fifth one which contains the data and results presentation. The sixth chapter contains discussion of the findings and conclusion of our study.

CHAPTER II

THE E-GOVERNMENT PHENOMENON

You have noticed in chapter 1 how the information and communication technology (ICT) revolution have played a main role in changing the daily life of the all humans on the earth. Nowadays, we can consider the ICT as effective tools to promote the progress of societies, and it also can be considered as the standard of progress and wealth for the countries. In addition, it can be used for the exchange of international interests between nations [12].

One of the greatest achievements of the revolutions of ICT is the development of the internet. It can be considered as a means of communication and interaction between individuals without the geographical restrictions [13]. So, the widespread usage of the internet usage has led to convergence of the whole world into a small village.

The capability of using the ICT in the private sector for provision of electronic services to customers led the humans to be more familiar with using technology tools in their daily life [4]. So, this makes a pressure on the public sector, which refers to the governmental agencies, to move their focus to provide electronic services to their citizens.

During this revolution of information in addition to the rapid and the successive developments in the ICT, which depends on the internet use, computers, and on the computers networks applications, it is necessary that the governments develop their agencies in parallel with this progressive technology and the rise of the private sector' need for electronic services. Indeed, the majority of countries have sought to make a technical infrastructure within their governments to connect their agencies together.

The deployment of the internet and the e-commerce within the private business sector also, significantly, helps in customizing users to online services and preparing them to the public sector. Roy [41] explains that: “much of the e-government work reflects the private sector activity that has both encouraged and pressured public sector organizations to act in a similar manner” (p. 48). This has led to the appearance and wide spread use of new terms and phenomenon such as, e-government, e-governance, m-government, and smart government.

The e-government service, in simple words, means the use of ICT by the governmental agencies in providing public services to various consumers (citizens, businesses, governmental employees, government, and nonprofit organizations).

Due to the emergence of this phenomenon (e-government) in the governmental agencies, the daily routine of government's transactions has started to transit from the regular way to the electronic way to benefit from technology facilities in order to deliver public services to the consumers [14]. The intention behind this transition in government transactions is to remove the restrictions imposed by the geographical boundaries to get public services, to eliminate the administrative and the financial corruption, and to free the consumers from service queues and other numerous advantages.

This chapter consists of six sections: in the first section, from a literary perspective; we presented how the e-government has been defined. Furthermore, the chapter also includes a presentation about the main goals of the e-government. Finally, e-government stakeholders are identified in the first chapter.

In the second section, from literary perspective; we presented why the e-government services are categorized into (8) types according to which type of stakeholders that they serve.

In the third section, the evidences on the transition processes from former government services to electronic government (e-government) services are not a straightforward process are presented. So, we presented some studies that are related with the stage of e-government development.

In the fourth section, we presented why the e-government architecture must be able to show various aspects of e-government works in one piece. This section consists from three subsections: Enterprise Architecture EA, Interoperability Frameworks (IA), and Web service architecture. In the fifth section, we reviewed the advantages of e-governments.

In the last section, due to our thesis topic that is related with the public services' delivering processes to citizens, we will review systematically the studies that are related with the acceptance of e-governments services from the citizens' perspective.

1. WHAT IS THE E-GOVERNMENT?

1.1. Definitions of E-government

E-government services have spread widely throughout the world and yet there is a lack of agreement among researchers about the true meaning of e-government [91]. It has been noticed in previous studies that the term e-government differs according to the context and direction of the writer [91]. The researchers have defined e-government slightly in different words; each one of them has defined e-government from his point of view [15]. Therefore, there are several definitions of e-government proposed to reveal the essence of e-government, such as, the definition of e-government by Norris and Moon [16] in which they said that it is the electronic aids that enable the governments to provide their services around the clock (24/7).

Snead and Wright have defined e-government as an accepted government procedures with the ability to provide government's services and required data to its beneficiaries in an effective and an efficient way at different sectors of state in many countries [17].

The World Bank has defined the e-government in its AOEMA report: “E-Government refers to the governmental agencies' use of information technologies (such as Wide Area Networks, the internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. These technologies can serve a variety of different ends: better delivery of the government services to citizens, improving interactions with business and industry, citizen empowerment through the access to information, or to give more efficiency to the government management. The resulting benefits can be: less corruption, increased transparency, greater convenience, revenue growth, and/or cost reductions” [18].

Lieber has defined the e-government as a better decision to implement commerce activities of buying, selling, or any business related with stakeholders [19].

Roy has defined electronic government (e-government) as the continuous innovation in providing services to the public, the involvement of citizens, in the governance of the transformation of internal and external relations using technology, especially the internet [41].

From our point of view, we define the e-government as the ability of the government's ministries and agencies to provide the information and services to beneficiaries from public services electronically with the lowest costs in an effective, transparent, equal, quick, and in an accurate way without restriction of location and time limitation by using a modern ICT with a security insurance for the users' information and for the database of agencies. By connecting the definition of the electronic government (e-government) with the topic thesis, we can define the electronic government (e-government) procedurally as how far the Iraqi correction services agency (ICS) will use ICT (computers, computers networks, internet, etc.) to enhance the public services that are delivered to various services consumers (inmates, inmates' family, citizens, governmental employees who do not work in ICS, and nonprofit organizations' employees).

1.2. Main Goals of E-governments

The major objective of e-government according to Nour et al and ESCWA [44, 45] include: enhancing the quality of services provided by the government and delivering them to citizens; improving government interaction with companies, industries and citizens in the other side; increasing the transparency of agencies and governmental organizations by increasing the accessibility and visibility of relevant information.

1.3. Stakeholders in E-government

Stakeholders participating in e-government can be classified as described next [47]. Firstly, e-government beneficiaries include citizens, corporations, government and government workers. Gil Garsia and Martinez-Moyano named the users "the demanders" for e-government services [46]. Secondly, monitoring the progress of e-government application and controlling the reform of public institutions is conducted by political decision makers. Thirdly, public institutions and individuals that are working as policy makers, directors, coordinators, and administrators. Gilles Garcia and Martinez-Moyano described government directors as "suppliers" of e-government services [46]. In addition, programmers enable and support e-government applications. Finally, partners and service providers, such as the private industrial sector for the necessary provision of ICT infrastructure required for e-government implementation.

2. TYPES OF E-GOVERNMENT APPLICATION

The e-government applications (see figure 3) can be categorized into 8 types according to which type of stakeholders that they will serve at the end in order to bring an important available to the government, public, business, workers, and other nonprofit, political, and charity organizations [21]. Those types are: Government-to-Citizen (G2C), Citizen-to-Government (C2G), Government-to-Business (G2B), Business-to-Government (B2G), Government-to-Employee (G2E), Government-to-Government (G2G), Government-to-Nonprofit (G2N), and Nonprofit-to-Government (N2G). We will go to list some details about the e-government application's types and sum up them in a Table 1.



Figure 3: Types of E-government [38]

2.1. Government-to-Government G2G

In this category, the government is connected with itself without the contribution of the citizens. This category is also known as "E-Administration". It connects many departments of the central and state governments through internet, police services, E-Court, etc. [22].

2.2. Government-to-Citizen G2C

In this category, the governmental agencies are directly connected with the citizens in order to deliver public services on demand and provide all technology's facilities to deliver information and services to citizens without the restrictions of time or location. The public information and services are available around the clock

(24/7 twenty-four hours a day per seven days a week) to citizens. G2C service includes services like issue of driver licenses cards, certificates, passports, etc. [22, 23].

2.3. Government-to-Business G2B

This category connects the private sector with the government's agencies. The governmental agencies provide various public services to the various private sectors. It encourages the implementation of the e-transactions initiatives like e-purchase, and the progression of an electronic store for the government procurement which includes services demanded by business companies like new or renewal of licenses, bills, taxes payment, etc. [21, 22].

2.4. Government-to-Employee G2E

In this category, an interaction and a connection are provided between the governmental agencies and their employees. Applying those services is beneficial to the governmental agencies as well as to their employees. In those services, the employees are allowed to access to their related information online [22]. Furthermore, this initiative can make the application to governmental jobs paperless through automation of the civil services and internal communication between employees [21].

2.5. Government-to-Nonprofit G2N

The governmental agencies communicate and exchange information with nonprofit agencies, political parties, and social institutions, legislatures, and so on [21].

2.6. Nonprofit-to-Government N2G

Data exchange and communication among the governmental agencies, nonprofit agencies, political parties, social institutions, legislatures, etc. [21].

2.7. Citizen-to-Government C2G

Design an electronic webpage within each governmental agency's web site to receive suggestions and complaints from citizens about the current electronic services provided by the governmental agencies. Actually, this is one of the objectives of the e-government project which is represented in gaining the

confidence and the satisfaction of the citizen about the current services and his participation in developing or adding new electronic services because the citizen, eventually, is the beneficiary of the services [20].

2.8. Business-to-Government B2G

E-government plays an important role in the private sector by linking the businessmen with the official government institutions in easier ways. This process will provide to the businessmen the ability to get official information about mercantile affairs and to achieve related transactions online, for example: paying taxes, obtaining permissions for business work or renewal old one, accessing into special government tender's information, and making transactions that are related with it. The e-government services prevent the financial extortion and the administrative corruption by preventing the friction with the governmental staff where all business transactions are accomplished through the websites of the governmental institutions [24].

Table 1: Characteristics of the Different Types of E-Government [21]

Items	Example on information types	Online Communications	Transaction
G2C and C2G	Information inquiry by citizens or corporations regarding licensure of new businesses, taxes, records, regulations, political programs, administrative affairs, etc.	Information inquiries on administrative and production processes; communication with political and authoritative parties, etc.	Providing internet-based services and publishing results; e-voting, internet based solutions, internet based participation, etc.
G2B and B2G	Information inquiry by citizens or corporations regarding licensure of new businesses, taxes, records, regulations, political programs, administrative affairs, etc.	Information inquiries on administrative and production processes; communication with political and authoritative parties, etc.	Providing internet based services and publishing results; e-transactions for accounting, electronic revision and supervision, e-purchase, etc.

Items	Example on information types	Online Communications	Transaction
G2G	The data exchange between different administrations and managerial levels in relation to governmental actions and regulations, decision-making, data, projects or programs, resolutions, and so on.	Information exchange between different authorities and different managerial levels for discussion; communication in negotiation and decision-making; interacting about business, regulations, projects or programs, and so on.	Inter-organization flow of work and data exchange; exchange of policies and solutions via the internet; management of information and knowledge, and so on.
N2G and G2N	Exchange of info about organizational acts, managerial strategy, data, records, rules, political programs, contextual information to decisions and so on.	Information exchange between different organizations and agencies for discussion; negotiation and decision-making; interaction in relation to administrative work.	Inter-organizational work; policies exchange, solutions, data, and information; knowledge management, etc.

3. STAGES OF E-GOVERNMENT

The transition of the governmental institutions from a bureaucratic paradigm that depends on standardization, departmentalization, and cost-efficiency, to the electronic government paradigm that depends on the coordinated network building, external cooperation, and services' beneficiaries is not a straightforward transition [1]. Due to this transition, tremendous operations and procedures are accompanied that represented in changes within the regulatory, administrative, and legal procedures in the governmental institutions, and that coordinate the linkage between the services consumers and the governmental agencies [20, 23].

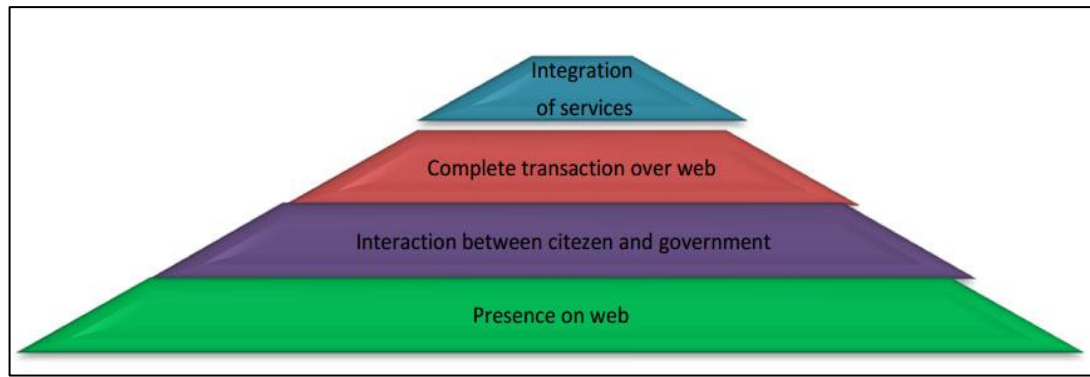


Figure 4: Stages of E-government [38].

Numerous strategies may be carried out by the government's agencies to upgrade to e-government services. E-government can be implemented in stages or phases see Figure 4. These processes differ from countries to another depending on the situation. The government's agencies are not restricted to the implementation of the transition process to the e-government in sequence (finish from one of the stages to start another) because these stages are not correlated (each one of them does not depend on the other). The final goal is to implement the transition to e-government services in an excellent and a short manner.

From a literary perspective, the researchers have described e-government's transition development as constructed models that contain stages [25]. Below, we will review some studies that are related to this topic.

3.1. Layne and Lee's Study (Four Stages)

The first model offered by Layne and Lee describes the e-government projects, which are composed of four stages. The first stage is cataloguing, while the second is transaction, and the last two stages are vertical integration, and horizontal integration. These stages are categorized according to the e-government integration and the technological and the organizational complexity increase as illustrated below and as shown in Fig(5) [23, 25].

3.1.1. Cataloguing

In this stage, the government's agencies are not familiar enough with the internet, so they prefer to decrease this danger through making a small plan, which is about dedicating the efforts in this stage on posting the government's information online by creating websites for the governmental agencies; thus, a single-way connection between the government and the services consumers is allowed [23, 25]. The

initiatives on this stage are targeted on organizing an online existence for the governmental agencies, for example, the public services consumers can only search for specific information about the government and view the details that are related to it and download them [23].

3.1.2. Transaction-based:

This stage is an extension of the first stage in which the services consumers are allowed to transact with the governmental agencies electronically; thus, a two-way connection between the government and the services consumers is allowed. So the effort of the e-government initiatives in this stage is specific to the posting of the database link on online interfaces. For example, the inhabitants are able to renew their licenses, and pay their fines online. From the government point of view, the existence of the website is bringing lots of advantages, such as:

- The time that the governments' staff will not waste in giving a basic question about services and procedures.
- It seeks to raise citizens' convenience and minimize the workload on the government's employees.
- Citizens use this information to know the details of the procedures, and to learn where to go when they are looking for the government services and the post-service support.

3.1.3. Vertical integration:

In this stage, the main concern is about the integration of the governmental agencies' work with the counterparts that operate within the same scope of work online [25]. For example, the process of sharing between the ministry of justice and other related ministries.

3.1.4. Horizontal integration:

This stage is about the integration of the governmental agencies' work with the counterparts that operate within a different scope of work online and that post to utilize out of a central portal.

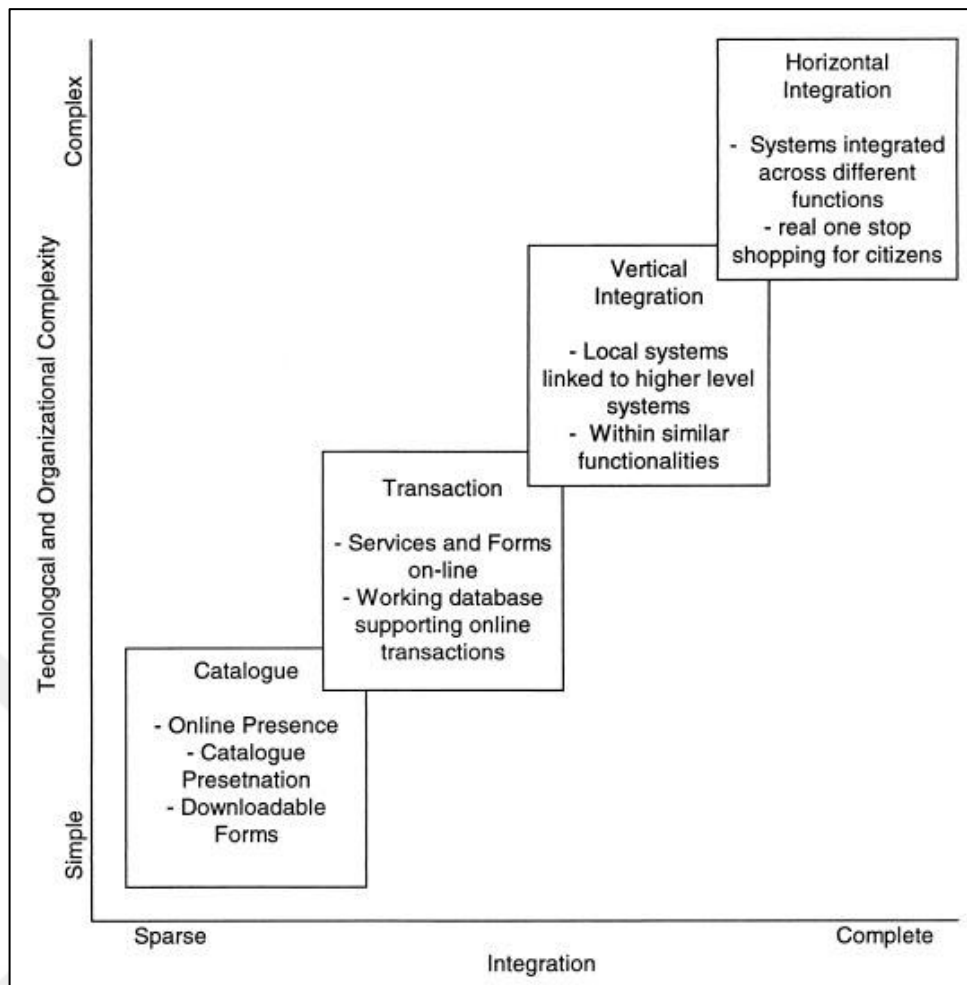


Figure 5 Dimensions and stages of the E-government

3.2. UN-ASPAs Study (Five Stages)

The second model is presented by the United Nations and the American Society for Public Administration (UN-ASPAs). It depicts the stages as a deputy of the government offices and services with an electronic form. The classification in this model depends on the public services' nature that is offered by the governmental agencies to the public services consumer in each stage. The number of stages that have been proposed in this model is five that represented in: emerging, enhanced, interactive, transactional, and seamless.

3.2.1. Emerging:

In this stage, the e-government initiatives are represented only as isolated sporadic official sites. The information is uncompleted, basic, and static.

3.2.2. Enhanced and interactive:

The e-government initiatives are slightly enhanced; the official information that is offered by official web sites is up to date with an extra regularity. Official web sites are increasing; therefore, information is becoming more dynamic via the e-government interactive stage; users can download various application forms, consult officials, interact via the websites, schedule appointments and submit requests.

3.2.3. Transactional:

In this stage, the services consumers are allowed to pay to get particular services and implement financial transactions online.

3.2.4. Seamless:

A full integration of the electronic services across the governmental agencies; as a consequence, the electronic services can be getting within the limits of the administrative and the legal controls.

3.3. Schelin's Study

As you have noticed, there is a big similarity between the previous two models. This similarity is shown in the UN-ASPA's study in the 'emerging' and 'enhanced' stages that are almost the same as the Layne and Lee's cataloguing stage. The 'interactive' and 'transactional' stages are hassling to the 'transaction' stage of Layne and Lee. The 'seamless' stage involves both the vertical and horizontal integration [25].

Schelin have organized a topology that is composed from the previous two models as illustrated in Table 2.

Table 2 The E-government Typology [27].

Stage	Direction	Scope	Tools	Inter-connectivity
emerging web presence	Managerial	Few services, if any	Only web	No connection to other sites or services
enhanced web presence	Managerial, informational	Few forms, no transactions	Web, e-mail	Links to local agencies
interactive web presence	Informational, users, managerial	Number of forms, online submissions	Web, e-mail, portal	Some links to state and federal sites
transactional web presence	Informational, users	Many forms and transactions	Web, e-mail, digital signatures, PKI, portals, SSL	Some links to state and federal sites

Stage	Direction	Scope	Tools	Inter-connectivity
seamless web presence	Users	Mirror all services provided in a person by mail and telephone	Web, e-mail, PKI, digital signatures, portal, SSL, and other available tools	Crosses departments and layers of the government

3.4. Limitations of Layne and Lee's and UN-ASPA's Study

It could be argued that the Layne and Lee (2001) model and the UN and ASPA (2002) model as well, as the stages strategy to e-government initiatives, are undesirable. Stages of e-government are no longer always following each other carefully in sequence or in a linear order. In addition, these models may not be suitable yet to the e-government application in the developing countries, so these countries have an opportunity to overcome their failures. It may be argued that the learning curve in the developing countries is moving faster; they can implement the requirements of all the stages roughly together [25].

3.5. Gartner Study (Four Stages)

In this study, the e-government execution is divided into four stages according to the plan that enables the decision makers to know the development level of the e-government initiatives. Those stages are [22]:

3.5.1. Presence:

It is the basic building block to start implementing the e-government project. In this stage, the starting point is to construct websites for the government institutions through which the citizen can get simple information about the government organization, such as, procedures, regulations, and laws in addition to how a citizen can complete his official transaction and working hours in a governmental institution.

3.5.2. Interaction:

In this stage, the services consumers (citizens, business, government, and nonprofit organizations) can simply interact with the governmental agencies to get the required e-government services. But the e-government services are, at this stage,

still not able to achieve their objective because they are restricted only to simple interactions to get specific public services.

3.5.3. Transaction:

During this stage the e-government services became complicated; in this stage the services consumers can pay taxes, renew their licenses, and procure their contracts.

In this stage the services consumers can get public services in anytime and anywhere. The interaction in this stage is higher than the previous stage (interaction).

3.5.4. Transformation:

It is the last stage of the e-government developing procedure; in this stage the e-government services have almost simulated the services of the regular government under administrative and legal rules. This model is one of the models that are interested in the citizen centralization by using the ICT, and under the basis of the regulatory and administrative rules.

3.6. Moon's Study

Moon's model consists of five stages, the first stage is described as "information", the second one is described as "two-way communication", the third one is described as "transaction", the fourth one is described as "integration", and the fifth and the last stage is described as "participation" [20, 29]. This model is not different a lot from the model of Hiller and Bélanger [30] due to the same stages that have been used in both studies. These stages are shown in Figure (6).

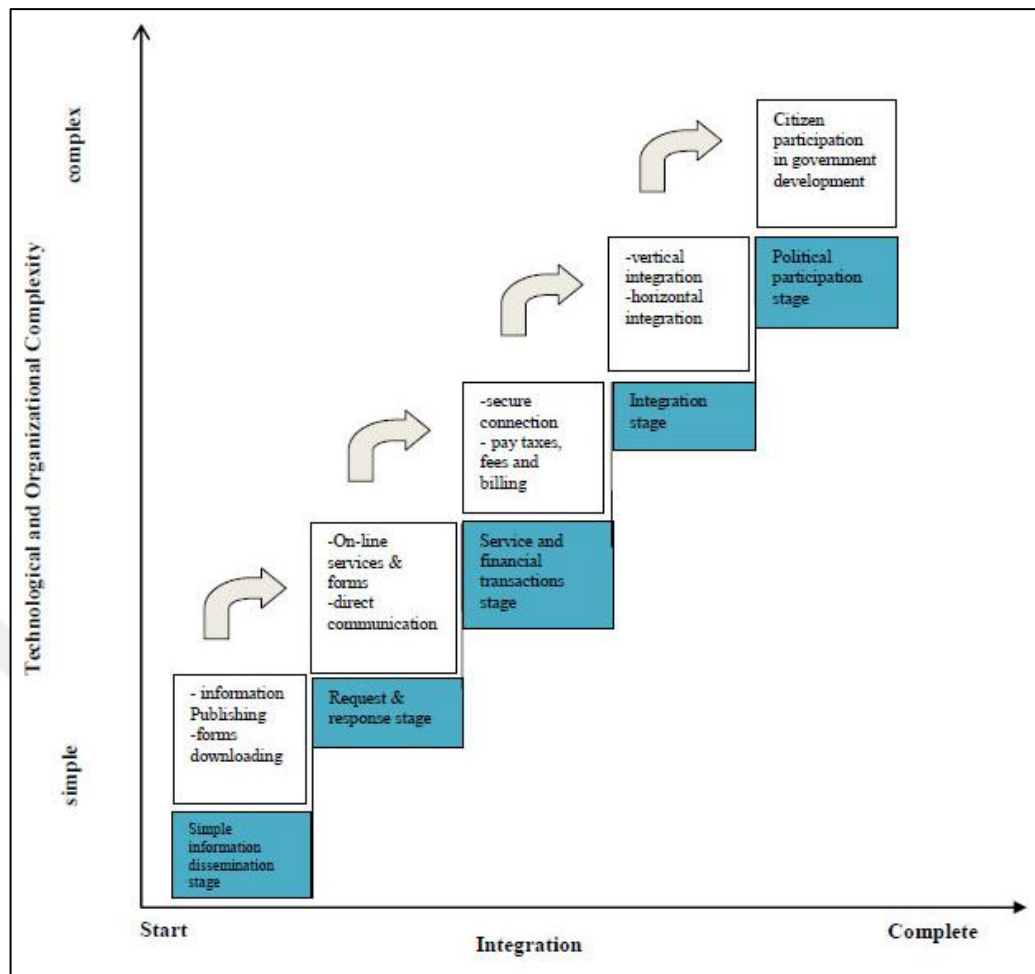


Figure 6: Moon's study stages [20]

4. E-GOVERNMENT'S ARCHITECTURE

E-government's architectures have begun as management instruments. They fundamentally concentrated on the technical information and communication technology (ICT) aspect of the government [86]. Now a days, the enormous development in the information and communication technology (ICT) necessitated the e-government architecture expansion to deal with the diverse aspects of the government, such as business, citizen, and information technology, and then to connect them to the governance and to the technological aspect of the government. This requires the collaboration of the programmer, the policy maker, and the budget in addition to IT offices in designing, implementation of services, and business construction.

E-government's architecture must be able to show the various aspects of the e-government works as a one piece: business process, data/information, applications,

and technology infrastructure. It is anticipated that the e-government architectures will contribute effectively in reshaping the government through delivering public services and solving problems like efficiency, accountability, and interoperability between the government's institutions inside and outside the state [31]

The success of the e-government initiatives depends on a lot of factors that differ from the perspective of the services consumers. Besides, it may also differ from a country to another. For example: the potential of the country's economic, political, and secure situation is depending on how far the country's infrastructure is developed, how far the citizen is accepting the e-government services, and so on. The software engineering considered the e-government architectures as an essential factor of the e-government initiatives success [32].

The terms: architecture, interoperability framework, and reference architecture are sometimes confusing and they are used alternatively. A framework is actually a number of applications and tools. It provides a set of tools that support the e-governments applications interoperability. Architectures have an essential role in not just listing the e-government applications but in organizing them too. Interoperability means the ability of the "ICT" and the business processes to exchange data and to share information and knowledge. The framework is more than a simple set of Service Oriented Architecture (SOA) application [31].

As a result of a large number of studies and researches, a wide range of e-government architectures have emerged (Interoperability Frameworks, Enterprise Architecture, XML [Extensible Markup Language] Architecture, and Web Services Architectures). Moreover, there are various architectural designs for the e-governments in a number of countries (The European one-stop government, Service Development Framework [UK], The US Federal Enterprise Architecture [FEA], etc.). In next subsections, we will review a literary diversity that is related to the e-government architectures [18].

4.1. The Enterprise Architecture EA

Governments from all over the globe increasingly depend on the internet services to achieve functional efficiency in core missions with citizens, the production, and governments. Efficient and economic designs for these e-governmental functions

require a strong, and a scalable approach to EA that integrates strategic impetuses with business needs and technological methods.

Despite the term “enterprise” is referred to as a corporation, it should be agreed that, in several conditions, an enterprise may exceed traditional structural limits. To confirm an active mapping and needs tracing, commercial design was integrated into the conception. The inclusion of business and ICT conceptions was a great advancing move in the development of the EA. Despite the advanced designs were kept also technically-run, the agreement between the business requirements and IT keys developed very rapidly [35].

As a whole, the important causes [34] for improving an EA are: agreement, integral, alteration, marketplace, and union. An EA presents real aids to the enterprise and to people who are concerned with developing the enterprise. The EA can find realities about the work, purposes, and business establishment in a comprehensible ways to support better organization and for make decisions. Additionally, the EA enhances communication between the business organizations and IT organizations within the company through a standardized communication language. It also supplies architectural sights that aid in debating the great systems complication and enables success of broad and complicated settings [35].

4.2. Interoperability Frameworks (IA)

The government must provide a smooth flow of information as permitted through the offices of the individual departments. To reach this aim, interoperability structures have been designed [31]. The e-government schemes developed very quickly to the degree that they have great quantities of information in the database. Combined work between the e-government structures is so essential for joining and transferring data between various structures. Thus, the necessity of combined work in the e-government is increasing every year.

The outlines of combined work is referred to as a group of bases and guidelines that designate the means in which organizations have accorded, or should reach agreement, to work together. So, an interoperability framework is not a fixed text and it might change over time as technologies, principles, and organizational needs [31]. European Commission has defined combined work as the capability of data, connection technology (ICT) systems, and backing to data reciprocity and to allow

the involvement of data and facts. Several models of interoperability were proposed to solve different problems in the e-government environment where interoperability is an essential requirement in the design and application of a great number of e-governmental enforcements with various information sources as numerous examples of combined work in e-governmental organizations with different data sources in the e-government enforcement [33].

4.3. Web Service Architecture

Network services, as a whole, are a circulated computing construction and they are referred to as one of the most important progresses in the field of the computer structural design in the last 3 decades [86]. The aim of any spread computing design is to permit interconnect and exchanging information in programs between the different environments. The term “Service-Oriented Architecture” (SOA) is associated with a pioneering integrating concept based on a coordinated set of international standards that already have an extensive consent from different organizations [31].

The aim of this standard is to enhance the compatibility of several software systems and, at the same time, reducing the high cost of software integration. SOA is based on current internet protocols and data models like http and XML which are supplemented by other standards [31]

5. The E-GOVERNMENT ADVANTEGES

While e-government includes a broad collection of activities, we can classify it to 3 distinct areas. They are between 2 relationships, government and populations, and between government and business. Each one has a different number of benefits. However, some common advantages include improving the efficiency, reliability, and the quality of services for the respective groups [22]. Below we are going to list some of the advantageous types of the e-government then we will summarize them in table (3).

5.1. Government-to-Government advantages (G2G):

The G2G sector is the corner stone of the e-government. It is marked that governments at the combination, country, and locally must develop and modernize their specific interior systems and techniques before the automatic contacts with

populations and business are presented. Government to government sector in e-government includes involvement of information and guiding electronic exchanges between different governmental organizations.

Several benefits are associated with G2G creativities one of which the most important is the cost reduction achieved by less time required for transaction completion as well as less number of employees required. Another advantage is an improvement in the management of public resources [22].

The aim of G2G headway is to reformulate and upgrade the definitive techniques between the governments by streamlining the investment and the coordination. To construct a model for implementing the neighborhood government is nearly the same thing as creating a nation [36].

5.2. Government to Citizen advantages (G2C)

The citizens' sector has the major section of the e-government benefits. Government to Citizen (G2C) enables the citizen communication with the government, which is the main goal of the e-government. This tries to make dealings, as payment of excises, renovating licenses, and having certain advantages, as well as saving time, and facilitation to do what you need. Government to citizen creativities also tries to improve the contact to the community information via using websites. Citizens have a supportive access to the government information and organizations from everywhere at every time by those methods that are made for the use of different channels [38]. Furthermore, the provision of governmental services through a "single window" is one of the main objectives of executing these initiatives. This means that citizen who need services that require a variety of tasks involving multiple departments without contacting each department individually. Thus, the G2C initiatives are driven by an urge to provide "better government" through improving efficiency and other more reliable outcomes [22].

5.3. Government-to-business advantages (G2B)

Government to business (G2B) can provide important competences for both governments and people. G2B fuses various organizations by exchanging the center of the government and the business parts, including scattering of methods, designs, standards, and directions. These systems focal points are a result of the government

ways of benefiting from business online experiences in extents, for instance, e-showcasing methods. The government to-business G2B is useful as the G2C system; they have the same way in redesigning the capability and nature of correspondences and trades with business. It constructs the value and straightforwardness of government contracts and augments [38]. The G2B is useful for cost reduction and increasing the purchase efficiency in the government [22]. Table 3 shows the benefits of the e-government [86].

Table 3: Advantages of E-government.

Government	Business	Citizen
<ul style="list-style-type: none"> - It saves time and cost. - It improves the employee's productivity. - Reduce excess tasks. - It removes corruption. - Accelerate procurement services. - Improves efficiency and effectiveness of government performance. 	<ul style="list-style-type: none"> -It removes routines with the government. - Reduce cost and increase efficiency- It makes more business. - Makes interaction with government easier. - Accelerate procurement services. 	<ul style="list-style-type: none"> - It reduces time and cost. - It provides easy way to access required information. - It provides multiple options for service delivery, such as, SMS, website, and e-mails. - Always and anywhere services. - It improves response to a particular request. - Promotes the democratic process. - It reduces the bureaucratic process.

6. ACCEPTANCE OF E-GOVERNMENT SERVICES:

E-government applications can potentially enhance the efficiency of government operations and service provision to its customers. Governments have embarked on applying e-government as a tool to enhance performance level and to achieve cost-effective outcomes among other important benefits. But this important project has faced many obstacles, such as citizen's trust in coping with the electronic services and the nature of data traded, and also the collaboration between the government organizations [51]. According to (ESCWA, Zahran, Evans, Yen, and Nour et al),

there are certain obstacles and challenges that exist in the actual implementation of e-government in the Middle East's regions such as: [45, 46, 48, 49]

- Inability of beneficiaries to use the computer and internet due to poor education levels and computer illiteracy.
- Inadequate infrastructure to implement and use e-government specially in remote areas that require high cost to build such infrastructure.
- Lack of acceptance by citizens especially in rural and remote areas as a result of lack awareness about the importance and benefits of e-government.
- Changes in work process which has been perceived by many managers and decision makers as risks that requires appropriate management and economic support for successful implementation.
- Current legislation doesn't accept the electronic aspects and processes of e-government application.
- The heterogenous aims among different governmental departments and the inconsistent use of e-government tools.
- The existence of digital divide.

Building citizens' trust towards e-government services has been advocated by scholars as being deterministic for their adoption intentions towards public e-services. Due to our thesis topic that is related with the delivery of public services to citizens, we will review studies that are related with the acceptance of e-governments services from the citizens' perspective.

The acceptances of e-government in different countries such as Kuwait, Saudi Arabia, China, and India have been studied by several authors [52, 53, 54, 55, 56]. Moreover, several models for adoption of e-government technologies have been developed and validated, such as Technology Acceptance Model (TAM), Diffusion of Innovation Theory (DOI), and Uniform Theory of Acceptance and Use of Technology (UTAUT). Every model attempts to predict and explain a person's behavior through the analysis of several independent variables. These studies are useful in comprehending the effects of individual's knowledge and provide insights about the adoption and attractiveness of e-government application. Furthermore, such studies have emphasized numerous factors that affect the decision to initiate the development of e-government services like, ease of use, perceived risks,

dependability, compatibility, external effects, internet safety, interpersonal effect, relative benefits, image, hedonic motivation, cost, value, etc. [50, 52,59,74, 75,76].

In Table 4, we have summarized the literature review that is related with the acceptance of e-governments services from the perspective of citizens according to the author, country, model, and the method that is used in the study.

Table 4: Summary of the literature related to the acceptance of e-governments services.

no	Author	country	Model(s) used	Method used
1	Lemuria Carter and France Belanger [58]	USA	Moore and Benbasat's (1991) perceived the characteristics of innovating	Quantitative
2	Carter and Bélanger [59]	USA	TAM, DOI, and web trust models.	Quantitative
3	Lean et al [60]	Malaysia	TAM, DOI, and web trust models	Quantitative
4	AL Awadhi and Morris [54]	Kuwait	UTAUT	Quantitative
5	Weerakkody et al. [61]	Saudi Arabia	UTAUT	Quantitative
6	Alateyah, Chang and Wills [52]	Saudi Arabia	UTAUT and Trustworthiness	Quantitative
7	Ali, H. and Ali, T. [62]	Kingdom of Bahrain	TRAM Model	Quantitative
8	Ahmed et al. [63]	Sudan	TAM	Quantitative
9	Liu et al.[64]	china	TPB & TAM& SST	Quantitative
10	Shajari and Ismail [65]	Iran	Trustworthiness	Quantitative
11	Alomari and Sandhu [66]	Jordan	DOI & TAM	Quantitative
12	Ozkan and Kanat [67]	Turkey	TAM& TPB	Quantitative
13	Shareef, Archer, and Dwivedi [68]	India	TAM	Quantitative
14	Tung and Rieck [69]	Singapore	create a theoretical framework	Quantitative
15	Al-Shafi and Weerakkody [70]	Qatar	UTAUT	Quantitative
16	Sinawong et al. [71]	Cambodia	TAM& TAM2 & DOI	Quantitative

From the literature review that we have listed in table (4), it can be noticed that most of the studies have used TAM model more than other models.

We have seen how that the construction of certain models is very close in meaning to the construction of other models. For instance, the “performance expectancy” and “usefulness and relative advantage” in TAM and DOI models, respectively, have similar meanings. This is also true for “the ease of use” in TAM model and the “expectancy” in UTAUT model [72]. Therefore, structures that have close meaning are being mixed in our work.

Table 5 shows factors that significantly affect the adoption of e-government services as extracted from our review of literature. These factors have been specified according to relevant particular models [52, 54, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71].

Table 5: Factors extracted from previous studies.

No	Construct	Frequency	Authors
1.	image	2	Carter and Belanger [58] Lean et al. [60]
2.	compatibility	3	Carter and Belanger [59] Carter and Bélanger [58] Shajari and Ismail [65]
3.	perceived ease of use	5	Carter and Bélanger [59] Alateyah, Chang and, Wills [52]. Ali, H. and Ali, T. [62] Ahmed et al. [63] Alomari and Sandhu [66]
4.	trustworthiness	7	Carter and Bélanger [59] Lean et al. [60] Weerakkody et al. [61] Alateyah, Chang, and Wills [52] Alomari and Sandhu [66] Ozkan and Kanat [67] Sinawong et al [71]
5.	perceived relative advantage	3	Lean et al. [60] Sinawong et al [71] Shajari and Ismail [65]
6.	performance expectancy	10	AL Awadhi and Morris [54] Carter and Belanger [59] Ali, H. and Ali, T. [62] Weerakkody et al. [61] Ahmed et al.[63] Liu et al.[64]

No	Construct	Frequency	Authors
			Alomari and Sandhu [66] Lean et al. [60] Shajari and Ismail [66] Sinawong et al [71]
7.	effort expectancy	3	AL Awadhi and Morris [54] Weerakkody et al. [61] Al-Shafi and Weerakkody [70]
8.	social influence	5	Awadhi and Morris [54] Tung and Rieck [69] Al-Shafi and Weerakkody [70] Alomari and Sandhu [66] Tung and Rieck [69]
9.	facilitating conditions	1	AL Awadhi and Morris [54]
10.	Perceived service quality of the web-based service	1	Liu et al.[64]
11.	perceived behavioral control	1	Ozkan and Kanat [67]
12.	Attitude	1	Ozkan and Kanat [67]

Table 6 lists the most commonly cited factors extracted from our review of literature.

Table 6: The higher repeated extracted factors.

Factor	Frequency
performance expectancy	10
trustworthiness	7
perceived ease of use	5
social influence	5
compatibility	3
perceived relative advantage	3

The factors in Table 6 are ordered based on their frequency of use from the previous studies to illustrate their relative weights in influencing the acceptance of e-government services. The definitions of each of these factors are mentioned in Table 7.

Table 7: The higher repeated extracted factors definition.

Factors	Definition
perceived ease of use	It affects people's attitude in using the system, which affects people's intention toward using a system, which, in turn, defines the actual amount of system usage [58].
compatibility	The degree to which a creativity is compatible with current values, beliefs, experiences, and requirements of adopters [58].
trustworthiness	Beneficiaries should be confident in the government and the used technology as well [58].
Perceived relative advantage	The extent with which an innovation is perceived as superior to the current standards [59].
performance expectancy,	The extent to which employees believe that system usage will enable them to enhance and boost their job performance [77].
social influence	The effect of the reference group on the beneficiaries' behavior. The reference group involves relatives, spouses, friends, and colleagues [78, 79].

CHAPTER III

LITERATURE REVIEW

This chapter reviews briefly some literature related to the study. Due to the fact that the study scope is Iraq, most of the reviewed literature that was conducted in governmental agencies of Iraq and only one study from each one of various countries is selected for review.

This chapter includes six sections. The first section consists from five studies that were conducted in various government agencies in Iraq. In the second section, one study conducted in Saudi Arabia is reviewed. In the third section one study conducted in Uganda is reviewed. In the fourth section one study conducted in Turkey is reviewed. In the fifth one study conducted in Malaysia is reviewed. In the sixth section, one study that was conducted in Oman is presented.

1. IRAQ

Mohammed and Karim [80] performed a research to determine the possibility of application of e-government services in the General Authority for Taxation in Iraq from the perspectives of its employees. The study includes theoretical and practical parts. The data of the theoretical part have been collected from articles, PhD or master theses and books from related literature; while the data of the practical part have been extracted from observing the daily routine in the respective agency, questionnaire and interview with the sample of the study. The sample of the study consisted of the top management, head of departments and sections and number of employees in General Authority for Taxation Iraq. The revealed variety of points that are summarized as shown below:

- The sample of the study don't tend to use e-government services, and they didn't persuade that current staff has enough knowledge and ability to be ready to implement e-government services.
- The sample of the study didn't convince of the necessity of hiring new employees who have enough knowledge in technology to implement e-government services in their agency.

- The sample of the study didn't convince or were not confident that the top management has enough knowledge about e-government and they were not willing to adopt it or implement it.
- The study revealed that the respective agency doesn't have enough technology infrastructures to be ready for implementing e-government services. In spite of there are enough financial allocation to do this.

According to the results of this study, the researchers presented some recommendations as follows:

- There is a need to educate and convince the cadres of the General Authority for Taxation at all levels of the necessity of applying e-government service in the Directorate as it supplies a suitable solution to the majority problems that happen in their agencies.
- The researchers suggested expanding the dependence on the electronic systems especially the applying and using oracle database system to supply faster and better
- There is a requirement to familiarize the managerial structure to ensure the implementation of the e-government in the future.

Another study has been conducted by Hasan and Eubayd [81] to determine the implementation of the concept of e-government for the Civil Status Department and the related government-agencies in the governorate of Basra. In this research, databases have been created for the Department of Statistics in Basra General Hospital and Alkawani hospital including information about the birth and the death certificates. A database also has been created for the Basra Health Department, which is considered as the central database for all the hospitals and the of birth and death offices in Basra. A database had been created in the Department of Civil Status citizenship and was linked with the Basra Health Department. The citizens have been linked via Civil Affairs Department to fill their application forms including the photograph of the citizen. The Department of Governorate Security was linked to the database of the Civil Status to add the required information about any citizen in the field of security of the governorate only. Finally, the databases were connected the Department of certificate of Iraqi nationality and the Department of Civil Affair. This

study had been performed on the Oracle database system v10. The study reached to the following advantages:

- Providing better capabilities related to speed and accuracy.
- Providing better control related to protection, security and safety measures.
- Reduction of illegal operations.
- Transparency and anti-corruption measures.
- Saving time and effort to citizens and eliminating routine in conducting transactions.
- Do not lose data because it is available in more than one place and in several databases.
- It has been done to make multiple numbers of civil status cards per person does not affect the integration data, and has been found a solution to make the first version of civil status card number to remain permanent for each Civil status cards issued in the future to the citizen.
- Keeping up with developed countries.

Saeed's master thesis [86] proposed that the integrated system to be one of e-government applications. The aim of the study provides a solution to receive the requests of the citizens who are willing to work in the ministry of education in Iraq. That was considered the largest civil ministry in Iraq. The questionnaire had been used to test the adoption of e-government services which is most critical factor to success in e-government initiatives. The study revealed that 69% of sample's study had responded positively about the adoption of the e-government services.

Hassn's Master thesis [82] proposed Graphical user interface (GUI) as one of e-government services. The purpose of this system was to show citizen's information (first name, last name, birth date and so on) after comparing citizen's photo with images that were stored in the database. Another purpose of this work was to inhibit the fraud. The methodology of this study is qualitative.

Another study had been performed to test the efficiency of using the e-government applications in improving the performance of local governments (from the administrative, technical and citizens affairs) in office of the province of Babylon [83]. The researcher applied an electronic method of work processes and compared

the outcomes after application of this method with the standard paper-based procedure applied in the office of the province of Babylon.

The results of the study were summarized in the following items:

- There was a big impact for the usage of the electronic applications to increase the speed and the efficiency of the performance in the office of the province of Babylon.
- Connecting the sections that were working in the Office of the province with each other electronic network and systems especially in the administrative and the technical fields and the citizens' affairs which lead to the increase of the control over the performance both by decision-maker's officials or other regulatory authorities with the aim of ensuring the transparency and the integrity.

2. SAUDI ARABIA

Alqahtani's master thesis [84] aimed to determine the role of applying e-government services in the administrative development in the general directorate of civil defense according to the perspective of its employees. The data had been collected by questionnaire. The study reached multiple results. Some of these results are listed below:

- Study sample greatly agreed with the activation application of the electronic government services that led to administrative growth in the particular agency.
- The study showed that there were abundant challenges that encountered the request of e-government in the particular agency.

The recommendations of this study were:

- It is necessary to provide employees who have technology knowledge, technical infrastructure, and database system to store data and periodically maintenance for supporting the application of the electronic government services in the respective agency.
- It is important to stimulate senior management to support the transformation of the e-government services.

3. UGANDA

A researcher proposed a web-based application that enables government employees and officials to manage prisons centrally. The application features included easy access to any data available, record tracing and instant report generation about any specific prisoner. To collect information about the prison system before designing the proposed software system, the researcher had observed closely the daily routine, conducted interviews with prison's employee and performed some questionnaires. The proposed system was developed using MySQL database, PHP, CSS, JavaScript and HTML. The proposed system had been tested and was validated for functionality [85].

4. TURKEY

İskender's PhD thesis [90] aimed to determine if there were relations between the probable e-government transition success factors in Turkey and between the eighteen success factors that usually considered in the literature which led to successes e-government services. The methodology that was used in this study is quantitative. The study considered that the transition to e-government success, factors depended on eighteen success variables and independent on variables in relational model. This research is multidimensional quantitative study. It took into account only data collected from citizens who use e-government services and also it took into account data that are collected from governmental employees. Besides, it took into account technical, social, organizational, economic, political and legal dimensions. The data were collected from four centers and four local Turkish government agencies. The study got more than 400 responds that were collected from both citizens and governmental employee after common survey was implemented. The study revealed that the relationship between the probable success factors and the transformation success and did not cause or affect relationships as mentioned in the qualitative studies in the literature.

5. MALAYSIA

The Saman & Haider's study [87] described the e-Court as well as E-Shariah implementation and its impact. E-Court and E-Shariah was one of the seven pilot projects under several e-government applications in Malaysia. Another thing that has

been discussed was the implementation of electronic records management systems (ERMS) in Malaysian courts. E-Courts project was created to: permit online case filling, instance access to the document through trial and save human resource.

E-Shariah is a web communication system that combines different electronic services with the objective to reinforcement efficiency and effectiveness of Shariah courts processes. E-Shariah is proposed instead of manual system of all Shariah courts operations.

The data were gathered by interviews, surveys, observations and document reviews. The study revealed that using electronic records in Malaysian courts provide a lot of advantages for both citizens and the government.

6. OMAN

In Oman [89], a study conducted to investigate the internal and external factors affecting e-government implementation in governmental agencies. Study had been carried out by empirical study (qualitative research) in large ministry of Oman to examine e-government services efforts and identify the obstacles that faced e-government services during the last 3 years. The study reveal that: economic, political and social as well as technological issues can consider it as the largest challenge that face implementing e-government services from an institutional opinion. The practical implications from this study for policy makers and e-government project implementers in Oman can be summarized as follows:

- The challenges that were founded in this study referred that it is not easy to carry out the e-government project practically so it was necessary to concentrate on developing strategies that participated in diminishing the harmful outcome of these challenges.

There is a need to consistence the efforts of different governments, institutions, leaders, decision makers and implementers to ensure delivering high quality public services to people.

7. UK

Anaraki, Plugge, & Hill [92] made a study under the title “Delivering primary care in prison: the need to improve health information”. The data have been collected

through visiting all the four male adult prisons in the Thames Valley area and piloted one-to-one semi-structured interviews with healthcare staff to examine the info presented to them, the worth and expenditures of the data, and their existing information systems. The result of study depended on the primary care staff records in prisons which represented almost all the clinical data contained on the paper, but they do not have access to electronic clinical records nor to the internet. The main supposed obstacles to applying health technology in prisons were fears about potential cracks of security and discipline in prisons, concern about data security and the culture that gives low priority to health in prisons. The study revealed that to provide 'equivalence of care' for prisoners, primary care trusts need to apply full electronic clinical records in prisons and to ensure that staff have access to resources on the internet.

8. USA

Shelton, et al [93] suggested that the most promising applications for tele-monitoring is for chronic illnesses such as cardiopulmonary disease, asthma, and heart failure in the home. Fetal heart rate monitoring and infant cardiopulmonary functions were also monitored at a distance, as well as coagulation, or the level of activity of elderly people, assessed by the intelligent home monitoring devices. Hospitals, clinics, and prisons all used tele-monitoring, as they had ambulances equipped with systems connected to the receiving hospital. The obstacles to the development of tele-monitoring include the initial costs of systems, physician licensing, and reimbursement.

9. KENYA

Nyagowa et al [94] conducted a study to evaluate the contribution of four of the seven e-School dimensions to the success of the pilot phase of the New Partnership for Africa's Development (NEPAD) e-School project in Kenya. Survey and observations were used to collect information. The study conclusion, ICT infrastructure quality, content and communication quality, training effectiveness made considerable contributions to the success of the pilot phase of the NEPAD e-School project in Kenya.

CHAPTER IV

RESEARCH METHODOLOGY

Introduction

This chapter describes the research approach and methodology including details about the sample studied. It also outlines the data collection instrument with some details about its development and validation. The chapter also defines the data collection procedure as well as the procedure used in statistical analysis of the collected data.

1. Research Approach

The aim of this study is to test the feasibility of using the E-government applications in developing the ICS and determine the optimum technology to implement the application based on preferences of the application beneficiaries. Based on this goal, the descriptive methodology will be used in our research as it is the most suitable and feasible approach to achieve this goal.

2. Study Sample

Our study aims to collect data from any person working in/with or dealing with ICS or may be affected by automating the ICS services (collectively referred to in this study as ICS beneficiaries). Based in literature review and field analysis, we identified that ICS beneficiaries can be classified under four main categories:

- ICS managers and employees.
- Other governmental employees whom work requires dealing with ICS staff.
- Inmates.
- Citizens, who are either inmates' families or people seeking to employed by the ICS.

A convenient sample of 50 participant from each category that will be selected randomly to participate in the study. Sampling will consider including participants from various demographic categories (age, gender, administrative positions, experience level, educational level ... etc.) to ensure conclusiveness of the result. For the inmates category, a required security permission could not be obtained so they

were excluded from the study. Selected participants were surveyed in the General Directorate of ICS in Baghdad province, Iraq in the period from 10 May 2017 to 6 June 2017.

3. Research Hypothesis

To achieve the aim of the study, 6 hypotheses were formulated and tested. Hypotheses were classified to be tested either through data collected from the whole sample of the study or through a specific category of the sample. The hypotheses are as follows:

a. Whole sample

- H1: ICS beneficiary category does not have a significant effect on their preference level on using web interface for automating ICS services.
- H2: Education level does not have a significant effect on their preference level on using web interface for automating ICS services.
- H3: Familiarity with a technology does not have a significant impact on the technology preference of users in automating ICS services.

b. ICS Administrators and Employees

- H4: The Administrative position of an ICS worker does not have a significant impact on his/her preferences or perceptions towards ICS services automation. To facilitate testing this hypothesis, it was broken down into 9 sub-hypotheses as follows:
 - H4₁: The administrative position of an ICS worker does not have a significant effect on his perceived importance of introducing legal email services.
 - H4₂: The administrative position of an ICS worker does not have a significant effect on his perceived importance of response time to incoming emails.
 - H4₃: The administrative position of an ICS worker does not have a significant effect on his perceived utility of automating ICS services through web interface.
 - H4₄: The administrative position of an ICS worker does not have a significant effect on his perceived importance of promotion of trust through announcing the ICS responsibilities on a website.

- H4₅: The administrative position of an ICS worker does not have a significant effect on his perceived importance of sharing inmates' status information with his/her family electronically.
- H4₆: The administrative position of an ICS worker does not have a significant effect on his perceived importance of legal communication by using IT means.
- H4₇: The administrative position of an ICS worker does not have a significant effect on his perceived importance of automating inmate-rehabilitation services.
- H4₈: The administrative position of an ICS worker does not have a significant effect on his perceived utility of a controlled and filtered email service availability between inmates and their close relatives.
- H4₉: The administrative position of an ICS worker does not have a significant effect on his perceived importance of automating the inmate-visit permission procedure.

c. Other Governmental Employees

- H5: The Administrative position of a governmental employee who deals with ICS services does not have a significant impact on his/her preferences or perceptions towards ICS services automation. To facilitate testing this hypothesis, it was broken down into 5 sub-hypotheses as follows:
 - H5₁: The administrative position of a governmental employee working with ICS staff does not have a significant effect on his perceived importance of introducing legal email services.
 - H5₂: The administrative position of a governmental employee working with ICS staff does not have a significant effect on his perceived importance of response time to incoming emails.
 - H5₃: The administrative position of a governmental employee working with ICS staff does not have a significant effect on his perceived utility of automating ICS services through web interface.
 - H5₄: The administrative position of a governmental employee working with ICS staff does not have a significant effect on his perceived importance of promotion of trust through announcing the ICS responsibilities on a website.

- H5₅: The administrative position of a governmental employee working with ICS staff does not have a significant effect on his perceived importance of automating procedure for getting permission to enter to ICS for official work.

d. Citizens

- H6: The relative degree with an inmate does not have a significant impact on a citizen's preferences or perceptions towards ICS services automation. To facilitate testing this hypothesis, it was broken down into 9 sub-hypotheses as follows:
 - H6₁: The relative degree with the inmate does not have a significant effect on citizen's perceived importance of introducing legal email services.
 - H6₂: The relative degree with the inmate does not have a significant effect on citizen's perceived importance of response time for the incoming emails to the ICS.
 - H6₃: The relative degree with the inmate does not have a significant effect on citizen's perceived importance of automating ICS services through a web interface.
 - H6₄: The relative degree with the inmate does not have a significant effect on citizen's perceived importance of promotion of trust by announcing the ICS responsibilities on a website.
 - H6₅: The relative degree with the inmate does not have a significant effect on citizen's perceived importance of automating employment services.
 - H6₆: The relative degree with the inmate does not have a significant effect on citizen's perceived importance of sharing inmates' status information with their families electronically.
 - H6₇: The relative degree with the inmate does not have a significant effect on citizen's perceived importance of legal communication through IT means.
 - H6₈: The relative degree with the inmate does not have a significant effect on citizen's perceived importance of a controlled and filtered email service availability between inmates and their close relatives.
 - H6₉: The relative degree with the inmate does not have a significant effect on citizen's perceived importance of automating inmate-visit permission procedure.

4. Instrument

a. Instrument development

In order to collect data required for testing the formulated hypotheses, three questionnaires were developed. The first Questionnaire (Q1) was used to collect data from ICS employees, while (Q2) was used for other governmental employees and (Q3) was used to collect data from citizens.

Each questionnaire consisted of two parts. Part 1, was related to respondents' demographic and socio-economic characteristics as well as the degree with which the respondent was adopting IT tools in his/her daily life. All questions in this part were closed (multiple choice questions) so that the response received is consistent throughout all responses. Continuous variables, like age, were transformed to categorical variables to close-end the questions.

The second part consisted of Likert's-style questions that collect information about respondents' perceived importance of automating various ICS services as well as their preference toward the automation technology. Respondents answer questions by choosing a score out of a 5-point scale ranging from 1 (least important/least preferred) to 5 (most important/most preferred).

Questions in all 3 questionnaires were similar with some limited category specific differences that were summarized in Table 8. Appendices 1, 2, and 3 give complete details about the questions used in the questionnaire and the answer choices for these questions for Q1, Q2, and Q3 respectively.

Table 8: Summary of the 3 questionnaires used in this study

Part Number	Question Number(s)	Q1	Q2	Q3
Part 1	1,2	Collect information about the age and gender		
	3,4	Administrative position and work experience and education level (3a, 3b)	Education level and visitor/inmate relationship	
	5	The degree of different technology adoption and use		

Part Number	Question Number(s)	Q1	Q2	Q3
Part 2	1-9*	Measure the relative perceived importance of automating various ICS services		
	10**	Ranking various technologies that can be used for automating ICS services in order of personal preference		

* In Q2: there are only 1-5

** In Q2: this question is number 6

b. Instrument validation

For the purpose of validating the survey questions and ensuring that every question measures what it is supposed to measure, the questionnaire has been reviewed academically by the supervisor and a senior researcher. The survey was then translated to Arabic in a back-to-back manner to ensure functional equivalence of the terms used in the two languages (English to Arabic to English). The survey was then piloted through 5 participants from the sample of the study to check comprehensibility of the questions and point out any possible ambiguity. After making minor modifications based on reviewers' and participants' comments, the survey was ready for use in collecting information from target sample. Reliability of the part 2 questions (measuring perceived importance of ICS service automation) was tested through Cronbach's alpha coefficient with values above 0.8 considered acceptably reliable.

5. Statistical Analysis

As all questions were formulated in close-ended manner, all data obtained from the questionnaire was treated as ordinal data except for some demographic and socio-economic variables such as gender and administrative positions which were treated as nominal variables. Median and range were used to summarize ordinal variables, and frequencies and percentages for categorical nominal data. Chi-square (χ^2) goodness-of-fit test was used to test if the distribution of the demographic variables in our sample was similar to the population distribution of that variable.

Univariate analysis through Least-squares-regression was used for hypotheses testing, i.e., to determine if the independent variable in hypothesis significantly affects the dependent variable.

All tests were 2-tailed; p -values > 0.05 were considered statistically insignificant, <0.05 significant, and <0.01 highly statistically significant. Statistical analysis of all data was done by SPSS computer program V. 22 (IBM Corp., Armonk, NY).

Before presenting the test results it is worth to explain conducted-tests and presentation notation used. In following two paragraphs details about Chi-Square goodness-of-fit and Least-square-regression tests are given.

The Chi-Square goodness-of-fit test [95] is utilized to investigate if the distribution of a variable is significantly from the expected (population) distribution. When will present Chi-square result in Table 10 the below elements means:

Variable: Variable that required to measure it.

Categories: Choices that belong to variable.

Frequency: The number of study's sample that had selected this choice.

Chi-Square: The result of the Chi-Square test, which shows the extent of a relationship between the variables and is compared to a specific tabular value of the identifier, whether it expresses a correlation or not.

Degree of freedom: The degrees of freedom are a factor of the test and are calculated by subtracting 1 of the number of choices for the variable.

Significance: p -values > 0.05 were considered statistically insignificant, <0.05 significant, and <0.01 highly statistically significant.

The least squares regression [96] is a statistical method for approximating variables in a dependent variable, which has linear relation with one or more independent variables. Depending on the fitting of the straight line (referred to as the regression line or the best fitting of the line) to the practical data (plotted as a scatter diagram). This method targets at deriving good relation (best fitting), that may be utilized to forecast future values of one variable when the value of the other is identified. It has this name because, in its computation, the addition of the squared

deviations of the computed (future) values from the measured (past) values of the variables is reduced.

When will present least squares regression result in Table 14, 15, 16, 17, 18 & 19 the below elements means:

Hypothesis Number: Hypothesis number.

Dependent Variable: Its value effect by independent variables.

Explanatory Variable: Independent variable its value effect on dependent variable's value.

Constant and Coefficient: value specialized for test.

R-squared : A factor that determines how much of the change in the dependent variable is explained by the change in the explanatory variable. It indirectly indicates the degree of (dependency) between variables, and how useful one variable is in predicting the value of the other.

CHAPTER V

RESULTS

1. Demographics

A total of 150 responses were received by participants in this survey. The surveyed participants were categorized into three categories: ICS employees, employees of other supporting governmental agencies (other employees) and citizens visiting the ICS department for job application or requesting a permission to visit an inmate. A questionnaire was prepared for obtaining data from inmates but the survey has not been conducted because the permission was not granted by the ICS administration.

Of the 150 responses received, 13 responses were excluded because they were either incomplete, invalid or inconsistent. The excluded responses were 3 from ICS employees, 4 from other employees and 6 from citizen. Table 9 summarizes the demographic characteristics of the studied sample. The age and gender of respondents broken by ICS beneficiary category is illustrated in Figure 7. The label government employees in the figure indicates employees of governmental agencies other than the ICS who work to support the ICS services. The colored legends represent the age categories.

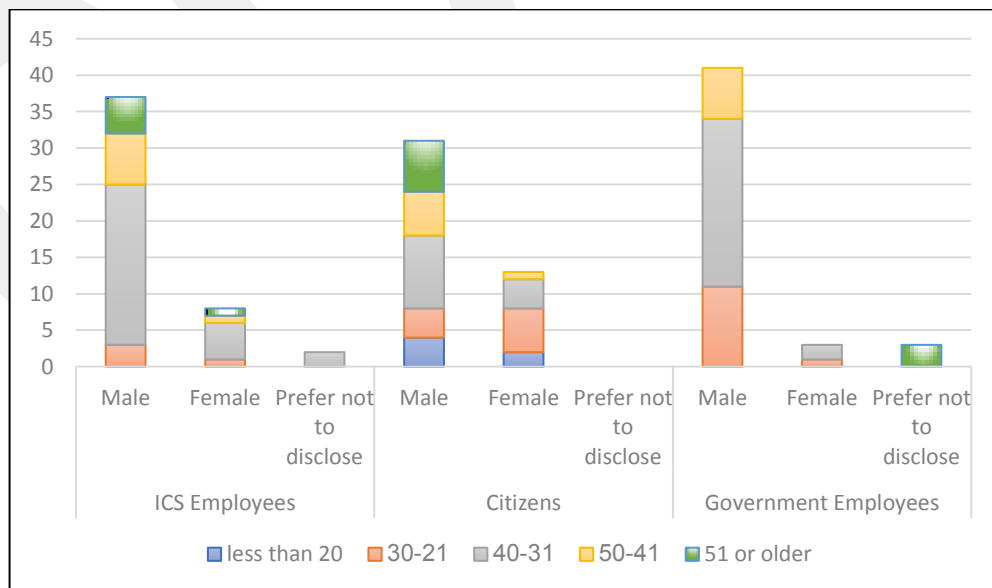


Figure 7: Age and gender distribution of respondents broken by ICS beneficiary category

Table 9: Demographic of the study sample

Characteristic		ICS Employees		Other Employees		Citizens		All Sample	
		n	%	n	%	n	%	n	%
Valid Responses		47	100	46	100	44	100	137	100
Age Category	less than 20	0	0.00	0	0.00	6	13.64	6	4.38
	21-30	4	8.51	12	25.53	10	22.73	26	18.98
	31-40	29	61.70	25	53.19	14	31.82	68	49.63
	41-50	8	17.02	7	14.89	7	15.91	22	16.05
	51 or older	6	12.77	3	6.38	7	15.91	16	11.67
Gender	Male	37	78.72	41	87.23	31	70.45	109	79.56
	Female	8	17.02	3	6.38	13	29.55	24	17.51
	Prefer not to disclose	2	4.26	3	6.38	0	0.00	5	3.64
Education Level	Primary School	1	2.13	1	2.13	3	6.82	5	3.64
	Secondary School	3	6.38	24	51.06	29	65.91	56	40.87
	Bachelor	42	89.36	21	44.68	12	27.27	75	54.74
	Postgraduate	1	2.13	1	2.13	0	0.00	2	1.45
Administrative Position	Director General	2	4.26	0	0.00				
	Director of the department	2	4.26	1	2.31				
	Director of the division	15	31.91	4	8.51				
	Civil Servant	27	57.45	20	42.55				
	Procedural force	1	2.13	0	0.00				
	Other	0	0.00	22	46.81				
Experience in profession	Less than 5	7	14.89	3	6.38				
	6 - 10 Years	25	53.19	20	42.55				
	11 -15 Years	9	19.15	15	31.91				
	More than 15 years	6	12.77	9	19.15				
Relationship to inmate	1 st degree					24	54.55		
	2 nd degree					11	25		
	3 rd degree					1	2.27		
	4 th degree					1	2.27		
	Non-relative					7	15.91		

Chi-square (χ^2) goodness-of-fit test showed that non-significant difference ($p < 0.05$) in the distribution of demographic variables (age, and education level) between the whole study sample and the general population, whereas the distribution of gender was significantly different. This means that sample respondents have demographic characteristics similar to the general population (except for gender) and the results of the survey can be reliably generalized to the whole population of interest. Table 10 summarizes the results of the χ^2 test for the whole study sample.

Table 10: Chi-square (χ^2) test results for the whole sample

Variable	Categories	Frequency	Chi-Square	Degree of freedom	Significance
Education level	Primary	5	5.195	3	0.158
	Secondary	56			
	Bachelor	75			
	Postgraduate	2			
Age	<20	6	1.935	4	0.748
	21-30	26			
	31-40	68			
	41-50	22			
	51 or older	16			
Gender	Male	109	109.945	2	<0.0001
	Female	24			
	Prefer not to disclose	5			

2. Frequency of IT Usage

The survey revealed that the studied participants show good command of technology use to varying degrees. A large proportion of the sample reported using Facebook and Twitter very frequently, viz, more than 40 times per day (45.25% and 49.63%, respectively). However, the percentage is relatively lower for other technologies such as mobile short message (SMS) and emails. Specifically, participants that have reported using SMS and Email more than 40 times daily were 2.91 and 11.76%, respectively while more than 50% of the sample reported using these technologies less than 10 times/day. Table 11 Summarizes the daily frequency of information technology use in different categories of participants and in the whole

sample. Figure 8 demonstrates the number of respondents who use various IT applications frequently (more than 20 times daily) in the whole studied sample.

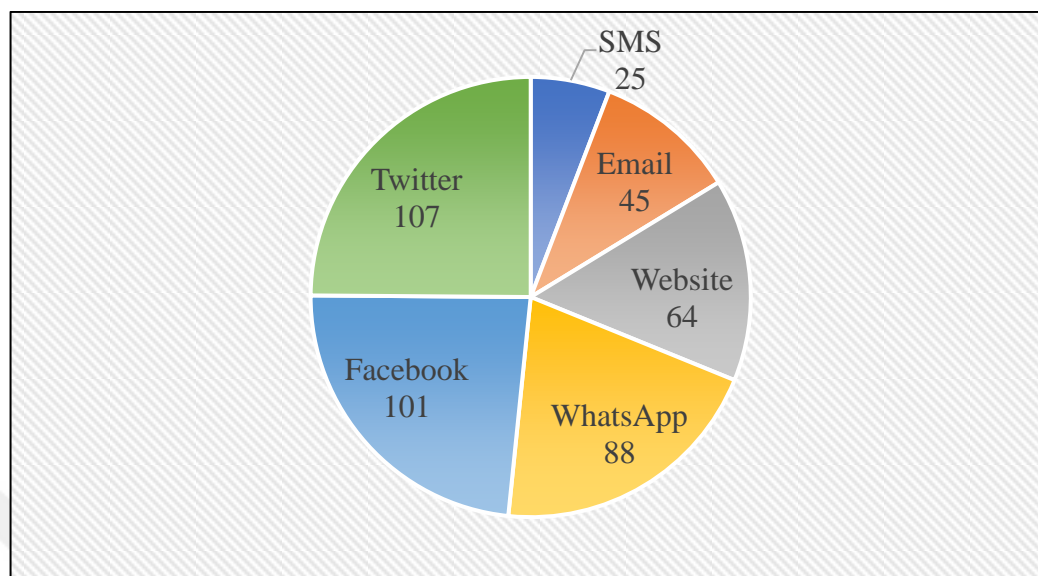


Figure 8: Number of respondents frequently (>20 times/day) use various IT applications in the whole sample

Table 11: Frequency of IT usage in the study sample

IT Application		ICS Employees		Other Employees		Citizens		All Sample	
		n	%	n	%	n	%	n	%
SMS	Less than 10	15	31.91	26	55.32	35	79.55	76	55.47
	11 - 20	16	34.04	15	31.91	6	13.64	37	27.00
	21 - 40	12	25.53	6	12.77	3	6.82	21	15.32
	More than 40	4	8.51	0	0.00	0	0.00	4	2.91
Email	Less than 10	15	31.91	26	55.32	30	68.18	71	51.82
	11 - 20	11	23.40	8	17.02	3	6.82	22	16.05
	21 - 40	13	27.66	8	17.02	8	18.18	29	21.16
	More than 40	8	17.02	5	10.64	3	6.82	16	11.67
Website	Less than 10	17	36.17	10	21.28	8	18.18	35	25.54
	11 - 20	11	23.40	16	34.04	12	27.27	39	28.46
	21 - 40	8	17.02	8	17.02	14	31.82	30	21.89
	More than 40	11	23.40	13	27.66	10	22.73	34	24.81
WhatsApp	Less than 10	1	2.13	7	14.89	2	4.55	10	7.29
	11 - 20	13	27.66	12	25.53	15	34.09	40	29.19
	21 - 40	18	38.30	10	21.28	17	38.64	45	32.84
	More than 40	15	31.91	18	38.30	10	22.73	43	31.38

IT Application		ICS Employees		Other Employees		Citizens		All Sample	
		n	%	n	%	n	%	n	%
Facebook	Less than 10	2	4.26	3	6.36	2	4.55	7	5.10
	11 - 20	12	25.53	14	29.79	4	9.09	30	21.89
	21 - 40	14	29.79	9	19.15	16	36.36	39	28.46
	More than 40	19	40.43	21	44.68	22	50.00	62	45.25
Twitter	Less than 10	5	10.64	5	10.64	0	0.00	10	7.29
	11 - 20	7	14.89	7	14.89	7	15.91	21	15.32
	21 - 40	12	25.53	12	25.53	15	34.09	39	28.46
	More than 40	23	48.94	23	48.94	22	50.00	68	49.63

3. User Perception of the Importance of Automation of ICS Services

Generally, most of the participants in total declared that they consider IT based automation of ICS service important to varying degrees. For instance, 73.72% of the sample participants reported they believe that the use of legal email services is important/very important. We summarize data regarding this topic in table 12. The table shows that ICS employees rank email response time as the most important factor to be considered when automating ICS services followed by provision of services through a web-based platform. The provision of controlled and filtered email services between inmates and their families was, however, ranked as least important service to considered in ICS automation (ranking based on the total number of important/very important responses). On the other hand, other governmental employees reported that automating the entry requests for official work is the most important while legal email services as the least important. Citizens ranked automation of family services as the most important and announcing ICS responsibilities on the website as the least important.

Figure 9 depicts the number of respondents who rate the importance of automation of various ICS services as important/very important in the whole sample (relative importance is the proportion of people who rated a specific service as important/very important to the total number of the same rating given to the four services that are common in the three questionnaires).

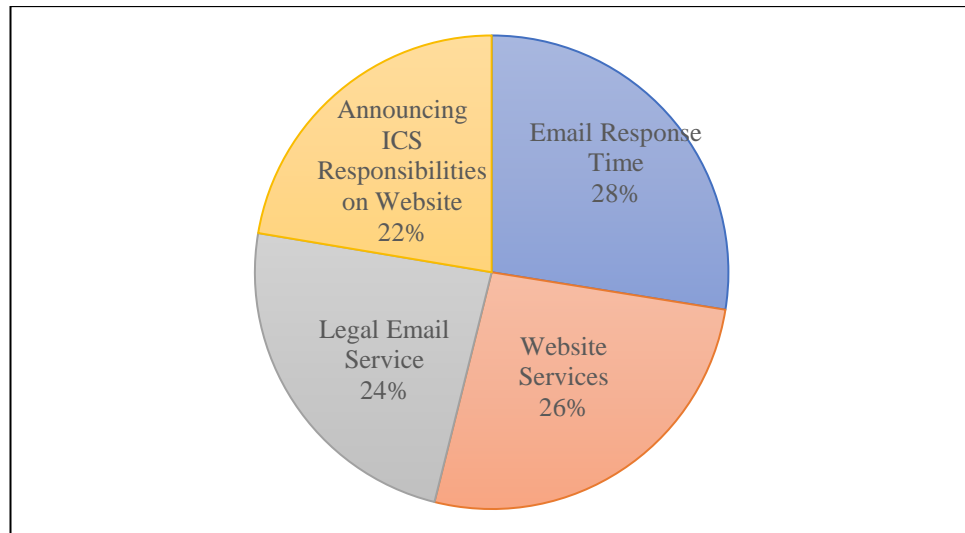


Figure 9: Relative importance of automation of various ICS services as perceived by respondents in the whole sample.

Table 12: User perception of the importance of IT based automation of ICS services ranked in order of relative importance

Service/Importance	ICS Employees		Other Employees		Citizens		All Sample		
	n	%	n	%	n	%	n	%	
1. Automating Request of Permission for Official Work	Unimportant		0	0.00					
	Moderate		0	0.00					
	Important		11	23.40					
	Very important		36	76.60					
2. Email Response Time	Unimportant	4	8.51	0	0.00	3	6.82	7	5.10
	Moderate	3	6.38	1	2.22	8	18.18	12	8.75
	Important	23	48.94	13	28.89	17	38.64	53	38.68
	Very important	17	36.17	31	68.89	16	36.36	64	46.71
3. Website Services	Unimportant	2	4.26	0	0.00	4	9.09	6	4.37
	Moderate	7	14.89	1	2.22	10	22.73	18	13.13
	Important	21	44.68	12	26.67	19	43.18	52	37.95
	Very important	17	36.17	32	71.11	11	25.00	60	43.79
4. Sharing Inmate Status Information on Website	Unimportant	4	8.51			2	4.55		
	Moderate	9	19.15			13	29.55		
	Important	21	44.68			21	47.73		
	Very important	13	27.66			8	18.18		
5. Automating Rehabilitation for Released Inmates	Unimportant	5	10.64			4	9.09		
	Moderate	8	17.02			9	20.45		
	Important	14	29.79			25	56.82		
	Very important	20	42.55			6	13.64		

Service/Importance		ICS Employees		Other Employees		Citizens		All Sample	
		n	%	n	%	n	%	n	%
6. Automation of Requests for Visits	Unimportant	3	6.38			7	15.91		
	Moderate	11	23.40			11	25.00		
	Important	24	51.06			10	22.73		
	Very important	9	19.15			16	36.36		
7. Legal Email Service	Unimportant	7	14.89	0	0.00	9	20.45	16	11.67
	Moderate	9	19.15	1	2.27	8	18.18	18	13.13
	Important	24	51.06	17	38.64	15	34.09	56	40.87
	Very important	7	14.89	26	59.09	12	27.27	45	32.84
8. Automation of Family Services	Unimportant	7	14.89			1	2.27		
	Moderate	12	25.53			9	20.45		
	Important	21	44.68			14	31.82		
	Very important	7	14.89			20	45.45		
9. Announcing ICS Responsibilities on Website	Unimportant	11	23.40	0	0.00	12	27.27	23	16.78
	Moderate	8	17.02	1	2.13	11	25.00	20	14.59
	Important	20	42.55	11	23.40	15	34.09	46	33.57
	Very important	8	17.02	35	74.47	6	13.64	49	35.76
10. Email Service between Inmate and Family	Unimportant	14	29.79			11	25.00		
	Moderate	14	29.79			3	6.82		
	Important	13	27.66			10	22.73		
	Very important	6	12.77			20	45.45		

4. Technology Preferences

The studied participant's ranked website services as the most useful IT application to be used as basis for automation of ICS services. The median value for importance of the website application was 7 (for most important) whereas the importance scores of Facebook and Twitter were lowest and ranked 2 and 1, respectively. Table 13 and figure 10 show the relative ranking of importance of different IT applications as perceived by the study participants.

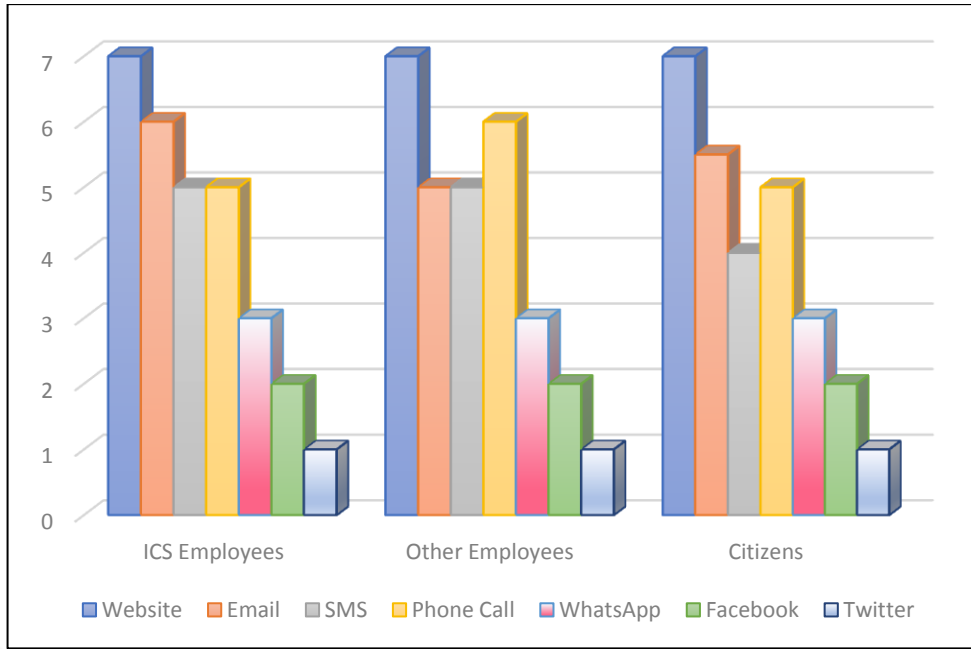


Figure 10: Preference ranking (median) of automation platforms as reported by study

Table 13: Preference ranking of automation platforms as reported by study participants

Service/Importance	ICS Employees			Other Employees			Citizens			
	n	median	range	n	median	range	n	median	range	
Website	7	28	7	3 - 7	24	7	1 - 7	27	7	1 - 7
	6	7			6			7		
	5	6			4			5		
	4	4			8			3		
	3	2			1			1		
	2	0			3			0		
	1	0			1			1		
Email	7	9	6	1 - 7	6	5	1 - 7	8	5.5	2 - 7
	6	15			15			14		
	5	11			15			9		
	4	5			8			7		
	3	4			2			4		
	2	2			0			2		
	1	1			1			0		
SMS	7	2	5	1 - 7	8	5	1 - 7	7	4	2 - 7
	6	9			9			6		
	5	13			12			8		
	4	14			12			17		
	3	5			5			3		
	2	3			0			3		
	1	1			1			0		
Phone Call	7	7	5	1 - 7	9	6	1 - 7	2	5	4 - 7
	6	5			18			15		
	5	13			10			18		
	4	13			7			9		
	3	6			1			0		
	2	2			1			0		
	1	1			1			0		

Service/Importance	ICS Employees			Other Employees			Citizens		
	n	median	range		n	median	range		n
WhatsApp	7	1	1 - 7	0	3	1 - 5	0	3	1 - 6
	6	5		0			2		
	5	2		2			4		
	4	7		6			7		
	3	20		23			15		
	2	11		10			10		
	1	1		6			6		
Facebook	7	0	1 - 6	0	2	1 - 5	0	2	1 - 4
	6	6		0			0		
	5	2		1			0		
	4	2		1			1		
	3	9		8			12		
	2	23		28			25		
	1	5		9			6		
Twitter	7	0	1 - 4	0	1	1 - 5	0	1	1 - 3
	6	0		0			0		
	5	0		3			0		
	4	2		4			0		
	3	1		6			9		
	2	6		5			4		
	1	38		29			31		

5. Hypotheses Testing

5.1. Whole sample

5.1.1. Hypothesis 1

In order to properly analyze H1, we have divided it into 7 sub-hypotheses. Each one examines the effect of user type on a different technology preference. Univariate regression analysis result for each sub-hypothesis is reported individually below followed by table 14 which summarizes the results for all sub-hypotheses together.

H₁₁:

Univariate regression analysis of H₁₁ showed that user type didn't have significant effect on the website preference level since p-value of 0.099. This means that there is not sufficient evidence to reject H₁₁. In other words, relation between user type and website preference level is statistically found to be insignificant in this study. So that we cannot say user type has impact on website preference level.

H₁₂:

Univariate regression analysis of H₁₂ showed that user type didn't have significant effect on the email preference level since p-value of 0.94. This means that

there is no sufficient evidence to reject H1₂. In other words, relation between user type and email preference level is statistically found to be insignificant in this study. So that we cannot say user type has impact on email preference level.

H1₃:

Univariate regression analysis of H1₃ showed that user type didn't have significant effect on the SMS preference level since p-value of 0.085. This means that there is no sufficient evidence to reject H1₃. In other words, relation between user type and SMS preference level is statistically found to be insignificant in this study. So that we cannot say user type has impact on SMS preference level.

H1₄:

Univariate regression analysis of H1₄ showed that user type did have a significant effect on the phone preference level since p-value of 0.009. This means H1₄ is rejected (Users of different categories have different preference towards using phone call as ICS service automation technology).

H1₅:

Univariate regression analysis of H1₅ showed that user type did have a significant effect on the WhatsApp preference level since p-value of 0.014. This means H1₅ is rejected (Users of different categories have different preference towards using WhatsApp as ICS service automation technology).

H1₆:

Univariate regression analysis of H1₆ showed that user type did have a significant effect on the Facebook preference level since p-value of 0.005. This means H1₆ is rejected (Users of different categories have different preference towards using Facebook as ICS service automation technology).

H1₇:

Univariate regression analysis of H1₇ showed that user type did have a significant effect on the Twitter preference level since p-value of 0.009. This means H1₇ is rejected (Users of different categories have different preference towards using Twitter as ICS service automation technology).

To sum up, the analysis of H1 showed that there is an agreement between users of different categories on their preference toward using websites, email, and SMS services. However, ICS beneficiary category significantly affects the degree with which users prefer using phone calls, WhatsApp, Facebook, or Twitter. Table 14 summarizes the regression analysis results for H1.

Table 14: Hypotheses test results for H1.

Hypothesis Number	Dependent Variable	Explanatory Variables	Constant (SE)	Coefficient (SE)	Significance	R-squared
H1 ₁	Website preference level	User type	6.68 (0.49)	-0.51 (0.3)	0.099	0.029
H1 ₂	Email preference level	User type	5.19 (0.45)	0.02 (0.28)	0.94	<0.001
H1 ₃	SMS preference level	User type	4 (0.44)	0.49 (0.28)	0.085	0.032
H1 ₄	Phone preference level	User type	3.89 (0.46)	0.77 (0.29)	0.009*	0.071
H1 ₅	WhatsApp preference level	User type	3.98 (0.39)	-0.62 (0.25)	0.014*	0.064
H1 ₆	Facebook preference level	User type	3.53 (0.4)	-0.72 (0.25)	0.005*	0.084
H1 ₇	Twitter preference level	User type	0.72 (0.34)	0.57 (0.22)	0.009*	0.071

SE= Standard Error

* Significant

5.1.2. Hypothesis 2

H2₁:

Univariate regression analysis of H2₁ showed that education level did not have a significant effect on the website preference level since p-value of 0.855. This means that there is no sufficient evidence to reject H2₁. In other words, relation between educational level and website preference level is statistically found to be insignificant in this study. So that we cannot say educational level has impact on website preference level.

H2₂:

Univariate regression analysis of H2₂ showed that education level did not have a significant effect on the email preference level since p-value of 0.083. This means that there is no sufficient evidence to reject H2₂. In other words, relation between educational level and email preference level is statistically found to be insignificant in this study. So that we cannot say educational level has impact on email preference level.

H2₃:

Univariate regression analysis of H2₃ showed that education level did have a significant effect on the SMS preference level since p-value of 0.001. This means H2₃ is rejected (respondents of different educational levels have different preference towards using SMS as ICS service automation technology).

H2₄:

Univariate regression analysis of H2₄ showed that education level did not have a significant effect on the phone preference level since p-value of 0.72. This means that there is no sufficient evidence to reject H2₄. In other words, relation between educational level and phone preference level is statistically found to be insignificant in this study. So that we cannot say educational level has impact on phone preference level.

H2₅:

Univariate regression analysis of H2₅ showed that education level did not have a significant effect on the WhatsApp preference level since p-value of 0.246. This means that there is no sufficient evidence to reject H2₅. In other words, relation between educational level and WhatsApp preference level is statistically found to be insignificant in this study. So that we cannot say educational level has impact on WhatsApp preference level.

H2₆:

Univariate regression analysis of H2₆ showed that education level did have a significant effect on the Facebook preference level since p-value of 0.024. This

means H2₆ is rejected (respondents of different educational levels have different preference towards using Facebook as ICS service automation technology).

H2₇:

Univariate regression analysis of H2₇ showed that education level did not have a significant effect on the Twitter preference level since p-value of 0.295. This means that there is no sufficient evidence to reject H2₇. In other words, relation between educational level and Twitter preference level is statistically found to be insignificant in this study. So that we cannot say educational level has impact on Twitter preference level.

To sum up, the analysis of H2 showed that there is an agreement between respondents of different educational levels on their preference toward using websites, email, phone, WhatsApp, and Twitter. However, respondents' educational level significantly affected the degree with which users prefer using SMS, and Facebook. Table 15 summarizes the regression analysis results for H1.

Table 15: Hypotheses test results for H2.

Hypothesis Number	Dependent Variable	Explanatory Variables	Constant (SE)	Coefficient (SE)	Significance	R-squared
H2 ₁	Website preference level	Education	6.06 (0.78)	-0.05 (0.29)	0.855	<0.001
H2 ₂	Email preference level	Education	4.03 (0.7)	0.45 (.025)	0.083	0.032
H2 ₃	SMS preference level	Education	7.11 (0.67)	-0.88 (0.25)	0.001*	0.123
H2 ₄	Phone preference level	Education	5.31 (0.75)	-0.1 (0.27)	0.72	0.001
H2 ₅	WhatsApp preference level	Education	2.33 (0.63)	0.27 (0.23)	0.246	0.015
H2 ₆	Facebook preference level	Education	1.01 (0.64)	0.53 (0.23)	0.024*	0.054
H2 ₇	Twitter preference level	Education	2.16 (0.56)	-0.22 (0.2)	0.295	0.012

SE= Standard Error

* Significant

5.1.3. Hypothesis 3

Univariate regression analysis of H3 showed that respondents had similar preference (non-significant difference) towards the use of web interface for automation of ICS service regardless of their familiarity with various technologies. This means that respondents similar preference towards website as a platform for automation of ICS services even if they don't frequently use websites in their daily lives. Therefore, there is no sufficient evidence to reject H3. Table 16 shows the regression analysis results for H3.

Table 16 Univariate correlation test results for H3.

Hypothesis Number	Dependent Variable	Explanatory Variables	Constant (SE)	Coefficient (SE)	Significance	R-squared
H3 ₁	Website preference level	Frequency of website use	5.93 (0.36)	-0.01 (0.14)	0.96	<0.001
H3 ₂	Email preference level	Frequency of email use	5.5 (0.3)	-0.14 (0.13)	0.293	0.012
H3 ₃	SMS preference level	Frequency of SMS use	5.01 (0.33)	-0.15 (0.16)	0.352	0.009
H3 ₄	WhatsApp preference level	Frequency of WhatsApp use	2.81 (0.4)	0.08 (0.13)	0.523	0.004
H3 ₅	Facebook preference level	Frequency of Facebook use	2.87 (0.43)	-0.14 (0.14)	0.315	0.011
H3 ₆	Twitter preference level	Frequency of Twitter	1.62 (0.36)	-0.01 (0.11)	0.925	<0.001

SE= Standard Error

* Significant

5.2. ICS employees

5.2.1. Hypothesis 4

Univariate regression analysis of H4 showed that the administrative position of ICS employees significantly affects their perception towards the importance of using email service for legal communications (H4₁), the importance of promoting trust through announcing ICS responsibilities on the website (H4₄), and the importance of

automating rehabilitation services (H4₇). However, there was no significant difference between different administrative positions regarding the perceptions about the importance of automating other ICS services. Therefore, H4₁, H4₄, and H4₇ are rejected while H4₂, H4₃, H4₅, H4₆, H4₈, and H4₉ cannot be rejected (association cannot be proven). Table 17 Summarizes the regression analysis results for hypotheses H4₁-H4₉.

Table 17: Univariate correlation test results for H4.

Hypothesis Number	Dependent Variable	Explanatory Variables	Constant (SE)	Coefficient (SE)	Significance	R-squared
H4 ₁	Importance of legal email service	Administrative Position of ICS Employees	3.23 (0.42)	0.22 (0.11)	0.037*	0.048
H4 ₂	Importance of response time to incoming emails	Administrative Position of ICS Employees	4.06 (0.37)	0.09 (0.09)	0.358	0.009
H4 ₃	Utility of website services	Administrative Position of ICS Employees	4.4 (0.36)	0.0001 (0.09)	0.997	<0.001
H4 ₄	Importance of announcing ICS responsibilities on website	Administrative Position of ICS Employees	3.14 (0.47)	0.25 (0.12)	0.033*	0.048
H4 ₅	Importance of sharing Inmate's status information	Administrative Position of ICS Employees	3.92 (0.6)	-0.001 (0.17)	0.993	<0.001
H4 ₆	Importance of Legal communication through IT means	Administrative Position of ICS Employees	2.69 (0.68)	0.16 (0.19)	0.415	0.015
H4 ₇	Importance of automating rehab. services	Administrative Position of ICS Employees	2.63 (0.64)	0.4 (0.18)	0.029*	0.101
H4 ₈	Importance of email services between. Inmates and families	Administrative Position of ICS Employees	2.69 (0.68)	0.16 (0.19)	0.415	0.015
H4 ₉	Importance of automating visit permissions	Administrative Position of ICS Employees	3.72 (0.54)	0.03 (0.15)	0.84	0.001

SE= Standard Error

* Significant

5.3. Other governmental employees

5.3.1. Hypothesis 5

Univariate regression analysis of H5 showed that the administrative position of other governmental employees didn't have a significant effect on their perceived importance of automating ICS services, contrary to ICS employees. Hence, Hypotheses H5₁, H5₂, H5₃, H5₄, H5₅ not rejected (Association between administrative position and perceived importance of ICS services automation cannot be established). Table 18 illustrates the univariate correlation test results for H5.

Table 18: Hypothesis test result for H5.

Hypothesis Number	Dependent Variable	Explanatory Variables	Constant (SE)	Coefficient (SE)	Significance	R-squared
H5 ₁	Importance of legal email service	Administrative Position of other governmental employees	4.83 (0.5)	-0.06 (0.15)	0.603	0.006
H5 ₂	Importance of response time to incoming emails	Administrative Position of other governmental employees	4.91 (0.47)	-0.06 (0.11)	0.605	0.006
H5 ₃	Utility of website services	Administrative Position of other governmental employees	4.99 (0.47)	-0.07 (0.11)	0.517	0.01
H5 ₄	Importance of announcing ICS responsibilities of website	Administrative Position of other governmental employees	4.65 (0.45)	0.02 (0.1)	0.865	0.001
H5 ₅	Importance of automating official requests	Administrative Position of other governmental employees	4.28 (0.38)	0.11 (0.09)	0.199	0.015

SE= Standard Error

* Significant

5.4. Citizens

5.4.1. Hypothesis 6

Univariate regression analysis of H6 showed that the respondent's relative degree with the inmate does not have significant effect on their perceived importance of automating ICS services except for automating inmate visit permissions for which there was a significant difference between different relative degrees (H6₉). Hence, H6₉ is rejected whereas H6₁, H6₂, H6₃, H6₄, H6₅, H6₆, H6₇, and H6₈ cannot be rejected (Association between relative degree with the inmate and perceived importance of ICS services automation cannot be established). Table 19 summarizes the univariate correlation test results for H6.

Table 19: Hypothesis test results for H6.

Hypothesis Number	Dependent Variable	Explanatory Variables	Constant (SE)	Coefficient (SE)	Significance	R-squared
H6 ₁	Importance of legal email service	Relative degree with the inmate	3.42 (0.28)	0.13 (0.11)	0.258	0.03
H6 ₂	Importance of response time to incoming emails	Relative degree with the inmate	4.05 (0.24)	0.0001 (0.096)	0.999	<0.001
H6 ₃	Utility of website services	Relative degree with the inmate	3.93 (0.24)	-0.04 (0.01)	0.653	0.005
H6 ₄	Importance of announcing ICS responsibilities od website	Relative degree with the inmate	3.32 (0.27)	0.01 (0.11)	0.921	<0.001
H6 ₅	Importance of promoting employment services	Relative degree with the inmate	3.9 (0.2)	-0.05 (0.08)	0.518	0.01
H6 ₆	Importance of sharing inmate's status information	Relative degree with the inmate	4.03 (0.22)	0.09 (0.09)	0.333	0.022
H6 ₇	Importance of legal communication through IT means	Relative degree with the inmate	3.47 (0.2)	0.14 (0.08)	0.095	0.065
H6 ₈	Importance of email communication with the inmate	Relative degree with the inmate	3.93 (0.32)	-0.02 (0.13)	0.869	0.001
H6 ₉	Importance of automating visit permissions	Relative degree with the inmate	4.43 (0.26)	-0.32 (0.11)	0.005*	0.172

SE= Standard Error

*Significant

CHAPTER VI

DISCUSSION AND CONCLUSIONS

1. Discussion

Overall, it could be noticed that the valid response rate to the survey was satisfactory. Only 13 out of 150 responses (8.67%) received were deemed invalid, incomplete, or inconsistent and therefore were excluded from our analysis. This is considered a good indicator of the comprehensibility of the survey questions and the ease with which it could be completed. The highest level of response exclusion was in responses received from citizens (6 out of 13 excluded responses). This could be attributed to the lower level of education noticed in that group compared to ICS employees or other governmental employees. It is also notable that the majority of responses were obtained from male respondents compared to females. This significant titling of sample towards male is natural as it reflects the factual sex distribution within ICS beneficiaries and hence we believe that it wouldn't affect the validity nor the generalizability of the results. This is also true regarding the distribution of administrative positions in ICS and other governmental employees where the majority of responses were received from civil servants which the most prevalent position in governmental agencies in Iraq.

The participants reported using Facebook and Twitter more frequently than other IT applications. However, this did not affect their preference toward the technology for automation of ICS services where the majority of the respondents preferred websites (most preferred) and email (second choice) as the automation platform (see Tables 11 & 13). The preference of website as the automation platform was consistent across different ICS beneficiary categories, and education levels as well (see Tables 13, 14 & 15). This reflects the solid agreement within the beneficiary community that website automation will be the most suitable tool to satisfy their needs regarding ICS service automation.

Analysis showed that the above findings are true regardless of the studied factors such as education level, familiarity with technology, administrative position (for ICS and other governmental employees), or relative degree with the inmate (for citizens)

(see Tables 15, 16, 17, 18& 19 for H2, H3, H4, H5& H6 respectively). However, there were a small number of respondents within the citizens group who were not inmates' relatives and were included as they had been seeking to be employed by the ICS. This explains why automating employment services did not rank high in citizens' preferences.

Twenty-eight percent of the respondents reported that the most important factor to be considered in the automation process is the email response time. Other factors that were frequently reported as important/very important are website services (26%), legal email services (24%), and promoting trust in ICS through announcing its responsibilities on the website (22%). This again reflects that ICS beneficiaries are in real need for service automation through website and email applications.

The analysis results also show that ICS employees believe that the most important services to be automated are email response time, provision of services through a web-based platform, and Sharing Inmate Status Information on Website (see table 12). This may be a reflection that these services currently consume most of the ICS employees time and efforts which can be saved through automation. On the other hand, other governmental employees rank automating entry permissions for official work as the most important service to be automated (see table 12) as obvious it is the most time and effort consuming step in their interaction with ICS. Unquestionably, citizens rank automation of inmate visiting-requests as the most important service to be automated.

Several studies that have been published about E-government applications in Iraq Have a little bit of conflicting evidence. Mohammed and Karim [80] studied the possibility of introducing e-government services in the general authority for taxation in Iraq. The study included participants from the authority's employees only. The authors conclude that the introduction of E-government application in Iraqi general taxation authority could face various challenge caused by lack of knowledge and experience of the employees to efficiently run the system as well as absence of the necessary infrastructure for the implementation. However, our study might invalidate the assumption of Mohammed's study as the findings show that the familiarity with technology did not have significant impact on respondents' preference toward ICS services automation. The findings of both studies indicate that employees unexperienced with ICT can still work with e-government applications as long as the

technology used is meeting their expected level of complexity (as the case of our study respondents preferred websites as the automation platform). Alternatively, the observed diversion in the findings may have raised from the characteristics of the participants since the gained experience from work could lead development of different habits.

Saeed [86] studied in his master thesis the readiness of Iraqi general population to use E-government application for requests submission to the ministry of education in Iraq. Saeed's study finds that only 9% of the respondents report that they receive quick response when they submit request to ministry of education via the internet whereas 49% and 29% of respondents receive late responses or no response at all, respectively. In our study, more than 85% of respondents reported that email response time is important/very important factor to consider when designing an E-government system. Combining these two finding rises an alarm for a potential factor that may hinder the progression towards fully-automated government services in Iraq. Any system that is being designed for providing E-government services should have elements that guarantee fastest possible response to requests from beneficiaries to ensure continuous acceptance by users and steady shift toward electronic use of government services instead of traditional methods. It is worth mentioning that the sample of Saeed's study was largely dominated by male at the expense of female respondents (23% females vs. 77% males). This reflects the cultural factors predominant in Iraq that makes many females avoid participating in such surveys which makes representative sampling with regard to sex a difficult task. In addition, males predominate the labor market in Iraq specially the governmental sector and Iraqi women are barely finding their place in this market. Since this study faced with similar cultural problems, the number of female participants is quite less than that of male ones. The culture in Iraq prevents to study the gender effect on human traits.

Anaraki, Plugge, & Hill [92] suggested that to provide 'equivalence of care' for prisoners, primary care trusts need to implement full electronic clinical records in prisons and to ensure that staff have access to resources on the internet. Shelton, et al [93] suggested the application of tele-monitoring in hospitals, clinics, and prisons, as they have ambulances equipped with systems connected to the receiving hospital, but one of the obstacles to tele-monitoring development includes the initial costs of systems.

In our study, the result was one of the ICS's services that recommended to be considered when automating ICS services is announcement of ICS responsibilities. So, one of the responsibilities of the ICS is health care of inmate [12]. We can classify electronic clinical records and tele-monitoring as one of the health care services that provide to inmate. Therefore, our study findings came in parallel with the findings of these studies.

The uniqueness of our study is that we have analyzed the impact of many factors including demographics, familiarity with technology, ICS beneficiary category, and other factors on the preference and attitude toward government services automation. The results of our study form a solid basis for the design and implementation of an E-government application to automate ICS services that meets users' needs and expectations which may be generalized and extended to other services provided by governmental agencies.

2. Conclusions

The urgency of applying E-government services in ICS and the current financial situation obligates the decision makers to prioritize the ICS's services to automate as a part of E-government functionality process as well as to ascertain the best technology to be used as the automation platform. Hence, we conducted this study to define the best alternative to deliver ICS services in an effective and efficient way, and to enable the ICS's employees to satisfy the ICS's consumers' needs in a modern, user-friendly, fast and stylish way by using available ICTs.

This study has first defined categories of people who may benefit from automating ICS services. The first category was the *ICS employees* themselves together with other categories that were served by the ICS employees, namely, *other governmental employees* who interact with ICS employees for official work, *citizens* who interact with ICs for inmate-visit entry permissions or seeking employment opportunities, and finally the inmates. Four questionnaires were developed. All were validated and used to collect data from various beneficiary categories except the one for the inmates category. The questionnaire developed for the inmates was not permitted to be surveyed by the Iraqi minister of justice.

Analysis of the collected data showed several important findings from which it could be concluded that:

- The survey used to collect data from various ICS beneficiaries was comprehensible, easy to complete to the respondents.
- There is an unmet need for different ICS beneficiaries to automate the services provided by or to them.
- The preferred automation platforms are websites (first choice) and emails (second choice) as reported by the surveyed sample.

Therefore, we recommend that the following to be considered when automating ICS services:

- The priority should be given to the following services in ICS transition to E-government:
 1. Automation of permission process official work.
 2. Sharing inmate status information with their relatives.
 3. Rehabilitation services for released inmates.
 4. Automation of permission process for visiting an inmate.
 5. Legal email services.
 6. Family services.
 7. Announcement of ICS responsibilities.
 8. Controlled and filtered email services between inmates and their families.
- Services automation is best to be achieved through a web-based application that is able to receive requests from the beneficiaries, store them in a database, and reply to requests electronically without the requiring beneficiaries to personally present at the department.
- As inmates constitute the largest proportion of ICS beneficiaries, it is recommended that further study to conducted to survey this category once administrative permissions are available to ensure conclusiveness of the findings.

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APPENDICES

1. Appendix 1: Q1 ICS Employees

-Please mark with (X) in front of the appropriate choice:

Part 1:

1) What is your **age?**

<= 20 21- 30 31-40 41-50
 >=51

2) What is your **gender?**

Male female Prefer not to say

3A) What is your **administrative position** in ICS?

Director/deputy General Director /deputy of the Department
 Director /deputy of the Division Civil servant Procedural forces

3B) For how many years have you been **working in ICS?**

1-5 years 6-10 years
 11-15 years >15 years

4) What is your **education level?**

Primary secondary
 Graduate postgraduate

5) Please indicate (mark with X), the number of web sites you are visiting and the number of communication transactions you are having **on the average in a regular day.**

	Web-visits	e-mail	SMS	WhatsApp	Facebook	Twitter
<10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11-20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21-40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
>40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 2:

The following survey aims to collect your evaluations about automating the services of Iraqi Correction Services (ICS) (from the ICS members and administrators point of view). Please rate the mentioned services using the scale in each question. Mark your choice with (X).

- 1- Please indicate the importance level of activate the **legal e-mail service** for mutual coordination and communication between ICS and other government institutions as well as between ICS and citizens.

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 2- What is the importance level of response time for the **incoming e-mails** to the ICS from other government institutions or citizens?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 3- How much do you think that **web site services** (announcements, information and ICS-contacts) will be helpful in enhancing the service delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 4- How much do you think that **announcing ICS responsibilities** on web page will be helpful in promoting the trust to the services delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 5- How much do you think that **sharing inmate's status information with his/her family by using information and communication technology alternatives** such as(website, email, sms , etc.) will be helpful in enhancing the service quality delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6- How much do you think that **automating legal and informative communication service** (including official paper delivery) between ICS and inmate’s family will be helpful in enhancing the service quality delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7- How much do you think that **automating rehabilitation for inmate** (Train and hiring, Health care, Social care, aftercare, etc.) will be helpful in enhancing the service quality delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8- How much do you think that **controlled & filtered** (ICS will control/filter the content and log the communication) email service between inmate and his/her family (a restricted list with few contacts) will be a significant development in ICS services?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9- Do you think that automating the **visiting procedures for an inmate from his/her family or any other person**, will be an improvement to the services provided by the ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10- In the case of automating the services and providing communication with peers (between ICS and other government institutions, between ICS and citizens) rate your preference for the following technologies. Please indicate your preference with numbers starting from 1 to 7 (the less important is 1 and most important is 7). **Please use discrete number for each option**

Web site	email	SMS	Phone call	WhatsApp	Facebook	Twitter

2. Appendix 2: Q2 Other Governmental Employees

-Please mark with (x) in front of the appropriate choice:

Part 1:

1) What is your **age**?

<= 20 21- 30 31-40 41-50 >=51

2) What is your **gender**

Male female Prefer not to say

3) What is your **job** and **administrative position**?

Director/deputy General Director /deputy of the Department
 Director /deputy of the Division Civil servant other

4) How many **work years**?

1-5 years 6-10 years
 10-15 years >15 years

5) What is your **education level**?

Primary secondary
 Graduate postgraduate

6) Please indicate (mark with **X**), the number of web sites you are visiting and the number of communication transactions you are having **on the average in a regular day.**

	Web-visits	e-mail	SMS	WhatsApp	Facebook	Twitter
<10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11-20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21-40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
>40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 2:

The following survey aims to collect your evaluations about automating the services of Iraqi Correction Services (ICS)(from the employees of other government institutions point of view). Please rate the mentioned services using the scale in each question. Mark your choice with (X).

- 1- Please indicate the importance level of activate the **legal e-mail service** for mutual coordination and communication between ICS and other government institutions as well as between ICS and citizens.

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 2- What is the importance **level of response time for the incoming e-mails to the ICS** from other government institutions or citizens?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 3- How much do you think that **web site services** (announcements, information and ICS-contacts) will be helpful in enhancing the service delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 4- How much do you think that **announcing ICS responsibilities** on web page will be helpful in promoting the trust to the services delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 5- How much do you think that **automating the procedure for getting permission to enter to ICS for official work** will be an improvement to the service delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6 -In the case of automating the services and providing communication with peers (between ICS and other government institutions, between ICS and citizens) rate your preference for the following technologies. Please indicate your preference with numbers starting from 1 to 7 (the less important is 1 and most important is 7). **Please use discrete number for each option**

Web site	Email	SMS	Phone call	WhatsApp	Facebook	Twitter

3. Appendix 3: Q3 Citizens

-Please mark with (x) in front of the appropriate choice:

Part 1:

1) What is your **age?**

<= 20 21- 30 31-40 41-50 >=51

2) What is your **gender?**

Male Female Prefer not to say

3) What is your **education level?**

Primary secondary
Graduate postgraduate

4) If you have a relative degree with the inmate please indicate that? (**Mark only one**)

First level (father, mother, son, daughter, husband, wife)
Second level (brother, sister, grandfather, grandchild)
Third level (uncle, aunt, nephew, niece)
Fourth level (cousin)
I don't have any relation with a inmate

5) Please indicate (mark with x), the number of web sites you are visiting and the number of communication transactions you are having **on the average in a regular day before you came to ICS**

	Web-visits	e-mail	SMS	WhatsApp	Facebook	Twitter
<10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11-20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21-40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
>40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part 2:

The following survey aims to collect your evaluations about automating the services of Iraqi Correction Services (ICS) (from the citizen's point of view). Please rate the mentioned services using the scale in each question. Mark your choice with (x).

- 1- Please indicate the importance level of activate the **legal e-mail service** for mutual coordination and communication between ICS and other government institutions as well as between ICS and citizens.

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 2- What is the importance level of **response time for the incoming e-mails** to the ICS from other government institutions or citizens?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 3- How much do you think that **web site services** (announcements, information and ICS-contacts) will be helpful in enhancing the service delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 4- How much do you think that **announcing ICS responsibilities** on web page will be helpful in promoting the trust to the services delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- 5- How much do you think that **automating the employment services** (jobs advertizing, job application, announcing the application results and inform the applicants with the final results) at the ICS website will be helpful in promoting the trust level in the services provided by the ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6- How much do you think that **sharing inmate's status information with his/her family by using information and communication technology alternatives** such as(website, email, sms , etc.) will be helpful in enhancing the service quality delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7- How much do you think that **automating legal and informative communication service** (including official paper delivery) between ICS and inmate's family will be helpful in enhancing the service quality delivered by ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8- How much do you think that **controlled & filtered** (ICS will control/filter the content and log the communication) email service between inmate and his/her family (a restricted list with few contacts) will be a significant development in ICS services?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9- Do you think that automating **the visiting procedures for an inmate from his/her family or any other person**, will be an improvement to the services provided by the ICS?

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>
<i>Lowest</i>	<i>Less</i>	<i>Moderately</i>	<i>Much</i>	<i>Very Much</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10- In the case of automating the services and providing communication with peers (between ICS and other government institutions, between ICS and citizens) rate your preference for the following technologies. Please indicate your preference with numbers starting from 1 to 7 (the less important is 1 and most important is 7). **Please use discrete number for each option.**

Web site	email	SMS	Phone call	WhatsApp	Facebook	Twitter