

Hungarian University of Agriculture and Life Sciences



Doctoral School of Economic and Regional Sciences

**E-GOVERNMENT IMPLEMENTATION:
AFFECTING FACTORS**

“Syrian e-government field study”

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Abbreviations

Abbreviation	Meaning
ATM	Automatic Teller Machine
EC	European Commission
EGDI	E-government Development Index
EG7	E government level 7
FAQ	Frequently Asked Questions
FCCT	Five Categories Classification Tool
GDP	Gross Domestic Product
GNI	Gross National Income
ICT	Information and Communications Technology
ISCED5	International Standard Classification of Education; Short cycle tertiary
ISCED6	International Standard Classification of Education; Bachelor's or equivalent level; Second stage of tertiary
ISCED7	International Standard Classification of Education; Master's or equivalent level
ISCED8	International Standard Classification of Education; Doctoral or equivalent level
ITU	International Telecommunication Union
IT	Information Technology
IP Address	Internet Protocol Address
OECD	Organization for Economic Co-operation and Development
TAM	Technology Acceptance Model
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action

1. INTRODUCTION

United Nations General Assembly has expressed that ICT¹ is the easier modern way for interchanging information seamlessly between citizens and governments and asserted the communication technologies' role in boosting knowledge exchange, enhancing development sustainability and technology global inter-collaboration by engaging newest technologies of telecommunication and up to date inventive applications (United Nations, 2012a).

More and more governments started to use ICT technologies as an effective changing tool to set a new relationship with people (UNDESA, 2014), this new digital relation is accompanied with emerging of new terms to describe the new communicating methods with/ within governmental institutions and digital-transformation of services, those terms such as network, tele-, e-, virtual-, cyber-, online, digital and similar became epithets of digital activities of social and governmental entities (Woolgar, 2002).

All the above terms refer to the manner in which a given set of technologies with assumed characteristics and capabilities are used to e-enable an existing set of services and associated organizational and institutional arrangements (McLoughlin and Wilson, 2013).

1.1 The Research Motivation

One important side of implementing governmental e-services this dissertation browses complies with Andréasson's (2015) opinion that the introduction of new IT systems has broad importance for the organization of public institutions, as e-government, by enabling citizens and NGOs of using, assessing, and analyzing information and data, makes public affiliations more accountable, provides the decision-makers with the necessary tools to take more rational decisions, and advances key public values (United Nations, 2016b; Lnenicka, and Nikiforova, 2021; Simonofski et al. 2022).

Also, according to the United Nations (2016a) and Fletcher-Brown (2021), e-government, with suitable strategic plans, can assist in generating income, improving skills, creating and finding jobs, and allowing the most vulnerable people to engage more in society by enabling everyone to access to information, data, and online platforms.

But, e-government implementation is not easy to be accomplished since there are many factors and obstacles facing this implementation when it starts to draw on the ground. Considerable studies have observed and discussed this issue as this work does, many of these studies are concerned with discussing the factors affecting e-government in specific cases, countries, regions, or economic groups, but there is no comprehensive research that covers all of these factors worldwide involving different groups of countries, cultures, and economic levels, this study, in one of its goals, collects these factors from more than 200 research, books, articles, papers, and reports concerns in e-government issues covering diversity in the studied backgrounds.

Moreover, much research is concerned with developing countries' e-government implementation, indeed, those countries have respectful differences in the economic situation, cultural background, population, and political and organizational structures and could be placed in various categories (United Nations, 2019). In the case of the Syrian Arab Republic, Syria had a very sharp turn in its

¹ Information and Communications Technology.

economic, social, and political situation in the year 2011 due to the beginning of the Syrian armed conflict that spread over more than twelve years and is still ongoing without any end expectations, this conflict made sever harm to political, organizational, social, and financial structures and significantly destroyed the national infrastructure (World Bank, 2020; 2022).

Syria and those countries who have developing economies or weak infrastructure still have the opportunity to follow up with developed communities by means of digital transformation and building their governments in a virtual form instead of conventional form, by concentrating on the implementation of e-governments, this will reduce cost and time to initiate governments on a modern basis, this idea has been confirmed by United Nations (2014a) e-government survey. So many lower-income countries clearly improved online service delivery and e-governance during the last few years, for instance, by taking the e-participation index as an indicator of e-government development, high gross national income (GNI)- as a proxy of measure for economic development- high GNI is not a necessary condition for developing e-government and adopting innovative ways of public service delivery (World Bank, 2016).

To measure the level and degree of e-government in a country, United Nations has developed an index to measure national e-government capacities called (EGDI); E-Government Development Index (United Nations, 2012b). This index is a tool for observing the proceeding of e-government implementation over the world and enables to make the comparison of development in implementation among different countries, as this study applies.

By taking a look at the e-government Development Index (EGDI) in United Nations surveys, it is clear that the e-government has been growing rapidly over the past years since 2001 (United Nations, 2018), in this regard, Alassaf et al. (2020a) concluded from United Nations surveys that it is not compulsory to be a developed country to be in a Very High or High EGDI level, Alassaf reached this conclusion by comparing EGDI level of countries with their GNI (Gross National Income as an indicator of economic development level set by the United Nations), as he found that there are countries have a high EGDI level despite their low GNI. But, regardless of the latter conclusion, ICT infrastructure in developing countries is still lower than developed countries' ICT infrastructure (United Nations, 2014a; ITU, 2015).

From the above-discussed ideas, this research works on defining and measuring the affecting factors on Syrian e-government implementation to provide a concrete set of information and data necessary for Syrian digital transformation, building modern digital government, and enabling Syria to jump over the lagging caused by the war and other economic, social, organizational, political and technical/ technological problems, keeping in mind that technological innovations offer real opportunities to leap over access barriers (United Nations, 2016a). To achieve this goal, the research developed a new tool that can be used by researchers containing all factors affecting e-government worldwide refined in five categories Social, Political, Organizational, Technological, and financial, which make it easier for those interested in e-government to find necessary factors in a specific field of science, this tool is called Five Categories Classification Tool (FCCT) and forms an important essential addition to this dissertation.

1.2 Research problems

This research concerns mainly with defining the Social factors affecting e-government implementation in the Syrian Arab Republic as an example of developing countries that suffer from armed conflict with damage in the economy, and the main problems this research is trying to answer:

- ▶ What are the Social factors affecting e-government Implementation in the Syrian context?
- ▶ What is the impact extent of each of the Social factors on implementing the Syrian e-government?

Also, the study concerns with collecting factors affecting e-government implementation worldwide and gathering them in tables contain all factors that interfere e-government, then developing scales to assess Social and technological factors, hence, this research will answer the following questions:

- ▶ What are the factors affecting e-government worldwide?
- ▶ How to assess social factors affecting e-government implementation?
- ▶ How to assess social factors affecting e-government implementation?

2. OBJECTIVES OF THE RESEARCH

This research aims to understand factors affecting e-government implementation that can facilitate or impede this implementation in the context of the Syrian Arab Republic.

2.1 Main objective of the study

The ultimate target of this research is to examine the social factors that affect the Syrian e-government implementation, then, the study determines empirically which of these factors facilitates or impedes the e-government implementation process in Syria.

2.2 Sub-objective of the study

The first objective of this study is to reveal the factors affecting e-government implementation worldwide, obstacles facing it, and supportive elements by reviewing the literature, especially the research accompanied by empirical studies in different countries, regions and covers differences in development levels, income, and culture to give e-government researchers a concrete base for starting their studies with a wide range of affecting factors.

To maximize the benefits of this target the study has developed the Five Category Classification Tool (FCCT), which provides those interested in the e-government context with comprehensive factors affecting the e-government implementation process, refined into five categories (Political, Social, Technological, Organizational, and Financial) to help in building up researches, empirical studies, planning future e-projects, and predicting obstacles that may face the field execution specialized in each branch of the five categories. The FCCT model correlates to five tables contains general items that measure each factor affecting e-government implementation, brief descriptions, and some of the studies that discussed each one of these factors. The mentioned FCCT and the five correlated tables form a powerful tool for empirical e-government studies and a significant addition to this research.

Also, this research targets to develop precise scales for assessing each of the Social and Technological factors affecting e-government, this addition makes it easier for those interested in social and technological disciplines to reap the benefits of the ready scales and start their field research depending on them.

3. LITERATURE REVIEW

3.1 E-government definition

Yildiz (2007) mentioned that there is no globally agreed definition of the e-government concept, one famous definition of e-government is “all use of information technology in the public sector” (Heeks, 2006).

Also, Kumar et al. (2007) defined e-government from another point of view, as the delivery of improved services to citizens, businesses, and others in society through a holistic change in the way governments manage information.

Another definition focuses on the accountability and performance of government activities, that e-government is an expression of using primarily internet-based information technology for enhancing and transforming: government services delivery, accessing government processes and information, and citizens’/organizations’ participation in government (DeBenedictis et al., 2002).

In this regard, Wihlborg (2005) defines three key forms of relationship in e-government, shown in Figure 1.

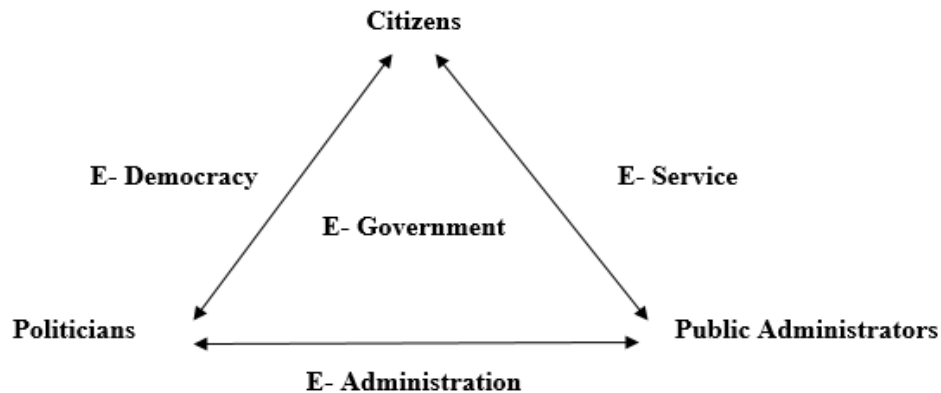


Figure 1. Key types of relationships in e-government.

Source: Author’s own development (2020), adapted from Wihlborg (2005:7).

The first key relation is e-democracy, which - in brief - comprises relationships between the electorate and politicians.

The second key relation is e-services, which represent dealings between public administration (government) and the citizen (G to C); here, many researchers such as Evans and Yen (2006) and Kamolov and Konstantinova (2017) have expanded this concept to include the relations between public administration and business (G to B).

Finally, the last key relation is e-administration, which involves the use of information technology tools internally within the government’s institutions and agencies, providing appropriate supportive reports for decision-makers to aid in making the best decisions (Wihlborg 2005), this relation exists between public administration and the government itself (G to G) (Saugata and Masud 2007). Some researchers have added another relation that may be integrated into G to G, which is the relation between the public administration and its employees (G to E) (Dowland et al., 2014). Moreover, e-

government may extend its services globally to cooperate with other governments, people, and enterprises in the region or worldwide (Kassen, 2014).

In this regard, this research by reviewing the literature formed a new conception of e- government as a virtual pool or a cloud that all relations between any ends of beneficiaries go through it without direct communications between those ends, here, e- government provides the applications and plays as an interactive portal for all e- government stakeholders and registers all transactions to preserves the rights of all players, this new understanding of e- government is illustrated in Figure 2., here, the anticipated relations expand to contain new kind of relations between different national e- governments (G to globe) that exchange information, accomplish tasks such as tax verification, and many other aspects of collaborations such as anti-money laundering, intelligence cooperation, security, economic and cultural activities, and so on, and this collaboration can be done at governmental, institutional, municipal, regional, business, or even individual levels.

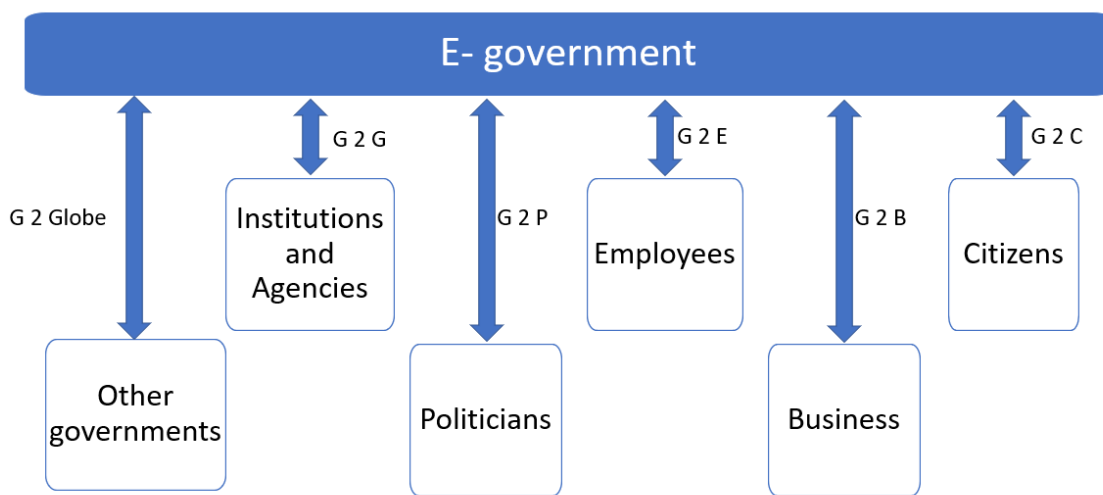


Figure 2. E- government relation concept.
Source: Author’s own development (2022).

3.2 E-government benefits

ITU² in its thematic reports finds that the adoption of technology minimizes corruption, increases transparency, and pushes to trust in government, which in turn helps the country to look for initiating future-ready government (ITU, 2019).

When technological advancement and innovation are implemented, it enables citizens and stakeholders to analyze, assess, and use data to make more informed judgments and make public service providers accountable (Lnenicka, and Nikiforova, 2021; Simonofski et al. 2022), hence, governments worldwide have invested in e-government to promote public information and services online to their citizens, in addition to advancing key public values (United Nations, 2016b).

From another point of view, e-government initiatives and applications should define the needs of the most vulnerable groups of the population, give assistance to generate income, improve skills, find

² International Telecommunication Union.

jobs, and enhance their careers, as the improved access to information, data, and online platforms give advancement to the capacity of vulnerable groups to engage in important areas of societal life (United Nations, 2016a; Fletcher-Brown, 2021), in this regard, one of the important drives for implementing e-government is to bridge the gap between government and citizens (Homburg, 2008).

Moreover, Brown et al. (2017) noticed a development to leverage information technology to present governments as platforms for public services.

The critical benefits that e-government gives to developing countries have been gathered by Kumar and Best (2006) and Ndou (2004) defined in four groups these are: Citizens' empowerment, efficiency and effectiveness gains (so government function as a truly citizen-centric gaining through the process efficiently and effectively), transparency and accountability (so citizens can access to the information about rules and policies), and finally the improvement in the quality of services delivery 24/7 this results in- time services and cost reduction for both the government and the users of e-government services.

From citizens' perspective government should be judged not only on its performance and ability to provide wanted good outcomes, but also on the degree to which decision-making is democratic, transparent, and inclusive (OECD, 2009), so in this context government enabling e-participation methods may enhance the evolution of policy design, voice peoples' priorities for budget allocations, and make it easier to the public to evaluate development outcomes in the long run, also reflects the interests of the entire society in more sustainable ways, furthermore, governments and its mechanisms should constantly be monitored and innovated to ensure that ICT enables to include the poorest and most vulnerable people (United Nation, 2016a).

Also, it should be taken in regard that implementing e-government strategies must ensure that returns from digital transformation should benefit society or address human and developmental challenges since there is a growing trend focusing on sustainability and inclusive growth issues (Buhr, 2015).

3.3 Approaches for implementing e-government

McLoughlin and Wilson (2013) have defined two approaches for implementing e-government depending on UN and OECD studies, the first concerns enabling technological capabilities and capacities implied in the design and functionality such as websites as an example (e.g. EC³, 2001; OECD, 2003).

The second approach focuses on studying user needs, government promotion of e-services and infrastructure, user take-up, and evaluating the readiness of global regions or nations to move through different stages of e-government development (United Nations, 2008).

³ European Commission (Commission of European Communities, 2001).

3.4 Stages of e-government

3.4.1 E-government implementation stages models

There are many e-government implementation models, a comparative study by Fath-Allah et al. (2014) identified and analyzed 25 different models.

This paragraph sheds light on several models that developed in literature as steps toward full implementation of e- government, Layne and Lee (2001) four stages model is the most famous one as it is the most highly-cited of all e-government papers model (Heeks, 2015), these stages are “Cataloguing, Transactions, Vertical integration, and Horizontal integration”, this model will be browsed in more detail in the next paragraph (3.4.2).

The research found another four stage model with another stages approach developed by Baum and Di Maio (2000), this model argues that the e- government begins with “Web presence” in this stage government provides a basic information on site with a little opportunity to interact, as “interaction” considers the next stage which allows the public to contact with the governmental organizations and officials online, the following stage will enable public to conduct business online with the governments this called “transactional stage”, this stage followed by “transformation stage” concerns in transforming government as a whole to be available in electronic shape, but this model didn’t give attention to the vertical and horizontal integration as steps into implementing e- government as Layne and Lee model did, these integration steps wasn’t shown in United Nations and ASPA (2001) model which sets five stages, first stage is the same of Baum and Di Maio (2000) model called “Emerging Presence Web”, the next stage “Enhanced presence” is an intermediate stage between previous stage and the next stage “Interactive” this followed by “Transactional Government” stage and finally “seamless” which means fully integrated presence.

Hiller and Belanger (2001) provide a model that has embedded steps of three previously mentioned models in its first four stages “Information Dissemination”, “Two-way Communication”, “Transaction”, and “Integration”, but this model adds another step which is “Participation” that gives the public possibility to vote and post comments online, this stage can be seen from one hand as a sub stage of “Two-way Communication” rather than an independent stage in consequence, and from the other hand it gives the e- government an advantage over the conventional government that is citizens integrate into government.

Wescott (2001) also developed a model consisting of six stages “Setting up an email system and Internal Network”, “Enable Inter-organizational and public access to information”, “allowing two-way communication”, “Allowing exchange of value”, “Digital democracy”, “Joined-up Government”, Wescott model demonstrates e- democracy as an individual stage to be built, and the final stage “Joined-up Government” means the integration of service delivery vertically and horizontally. Figure (3) demonstrates and compares above mentioned e- government implementation steps models.

In the next paragraph, Layne and Lee (2001) four stages model will be addressed in more detail since it is, as mentioned earlier, the most famous, repeatedly used in literature, and comprehensive to e- government implementation models (Fath-Allah et al., 2014).

7					
6					
5					Joined-up Government
4	Horizontal integration	Transformation	Seamless	Participation	Digital democracy
3	Vertical integration	Transactions	Transitional government	Integration	Value Exchange
2	Transactions	Interaction	Interactive	Transaction	Two-way Communication
1	Catalogue	The Web presence	Enhanced presence	Two-way Communication	Allowing access to information
0			Emerging Web presence	Information Dissemination	Internal network, and Emailing
	Layne and Lee, 2001	Baum and Maio, 2000	UN (2001)	Hiller and Bélanger (2001)	Wescott (2001)
	E-government implementation stages models				

Figure 3. Comparing E-government implementation stages models.
Source: Author’s own development depending on original models (2020).

3.4.2 Layne and Lee (2001) Model

Layne and Lee (2001) developed a four-stage model, which defines the anticipated evolutionary development of digital government along two dimensions. The first refers to the degree of technological and organizational complexity in modes of service delivery, the second refers to the degree of integration between vertical layers (state, regional local levels), and between horizontal layers (lateral relations between levels) of government.

The four stages of e-government are:

- 1- The first stage is “cataloging”, where digitized information is posted on- line to websites so the service (provide information) is provided essentially in one- way with little opportunity for two-way communication with citizens such as emailing and registering.
- 2- The second stage is “transactions”, where some services are made available on- line and stakeholders interact with government and public agencies, especially with regard to more transactional relationships such as paying taxes, purchasing online, etc...
- 3- The third stage is “vertical integration”, where government and public service delivery is developed to allow and enable more coordination between different levels of government.
- 4- The fourth stage is “horizontal integration”, where government and public service delivery is developed to allow and enable more coordination between different functions on the same level.

The third and fourth stages should develop in a way to adopt transforming service delivery instead of just “automating” or “digitizing” existing services, so citizens would consider ‘government as an integrated information base’ and front- line practitioners who, instead of being routine processors of information on bureaucratic ‘assembly-lines’, become ‘overseers’ of a fully integrated and automated process (Layne and Lee, 2001).

3.5 Factors affecting the implementation of e-government and the obstacles

Recently, in the context of e-government, the socio-technical perspective increased, due to the realization that the adoption of technology in government is affected by the complexity of social, organizational, technical, policy, political and other factors (Pardo et al., 2011).

Toots (2019) conducted research to explain the causes of e-participation systems' failure and found that e-government implementation faces three-fold challenges using e-participation systems: those typical to IS projects, those emerging from the public sector context, and obstacles that come from the complex context of democratic participation.

One of the important field studies about e- government in the middle east is Al-Shboul et al (2014) study which investigated factors and challenges affecting the implementation of E-government in Jordan. The results of this study show that budgeting and financial costs, human expertise, social influence, technological issues, lack of awareness, the resistance of public employees, data privacy and security, legal framework, the needed technology, administrative obstacles, and trust or belief in e-government are the most significant challenges and factors influencing implementation of E-government services in Jordan, whereas Alomari et al. (2009) indicates most influential factors that could influence e-Government implementation in Jordan grouped in four distinguished social factors: trust in terms of the security and privacy and trust in government, attitudes and beliefs, education, and accessibility.

In the same regard, Basamh et al (2014), has conducted a study defines some of the major challenges and obstacles that impede the implementation and adoption of e- government in the Kingdom of Saudi Arabia those are: infrastructure costs, computer literacy, privacy issues, accessibility, availability, and trust issues, the study also finds that challenges and obstacles are not only related to the various government agencies but they are also related to those using the e-Government services like government employees and citizens.

Sang, Lee and Lee (2009) define the crucial obstacles and barriers that face e-government implementation in Cambodia as variations in support among leadership, lack of high prioritization of e-government at present, a poor ICT infrastructure, a low rate of literacy, and a high turnover rate among government information technology staff.

Also, the factors affecting the implementation of e-government in Zambia, explored by Bwalya (2009), contribute to the delay in appropriate e-government adoption those factors are lack of adequate ICT infrastructure, provision of content in English other than local languages, lack of proper change management procedures, non-contextualization of e-government practices.

Another study concerns e- government in developing countries, Abu-Shanab (2014) shows the barriers that face e-government in developing countries, the study finds that the lack of technical support from government website support is the most critical barrier, followed by the lack of knowledge about e-government services.

Moreover, Field et al (2003), stated that issues of coordination and collaboration, including budgetary issues, should be defined to take the maximum benefits of e-government, and affirmed that external e-government barriers are often concern breakdowns, missing components or lack of flexibility in the government-wide frameworks that enable e-government, also, the latter study finds that in most times there is an inability to achieve a whole-of-government perspective in e-government implementation,

so budgetary barriers require the cooperation of multiple actors to be mitigated and to overcome obstacles, especially those relating to funding e- projects, here, Paroski et al (2013) case study concerned in implementing e-government at the local level in Serbia and suggests that even under severe financial constraints, an appropriate managerial and technical backgrounds, careful planning, and competent and strict management of implementation plans based on precise goals led to a speedy development of e-government.

In this regard, one of the important findings of Chang et al (2019) study, which concerns examining the performance of a cross-boundary e-government system, concluded that management support has a consistent relationship with efficiency, effectiveness, and accountability of this system, so this result draws attention to focus on management support in the e-government implementation process as one of the key drivers to increase success opportunities of tangible field implementation.

Furthermore, research by Nabafu and Maiga (2012) outlines that financial resources, building ICT infrastructure, citizen training, sensitization to relevancy and benefits of e-government, and social and political factors are some of the requirements for successful implementation of e-government in Uganda, another study by Rokhman (2011) also identifies crucial success factors of e-government implementation in Indonesia from citizen's and government perspectives, from citizen's perspective, the critical factors for using e-government services are relative advantage and compatibility, from government's perspective the success of e-government implementation is related to the existing of e-leadership and the availability of e-government training for government organizations' members, taking in regard that infrastructure availability is a precondition for relating citizen and government perspectives.

From another perspective, A thesis of Bernhard (2014) gives a better comprehension of how e-government policies are implemented in an e-governance context, depending on empirical case studies in Sweden. This research finds implementation of e-government and e-governance initiatives requires trust in the service provision among public administrators as well as among citizens, also, the research finds that the organizational settings and internal anchoring are greater constraints than new technology for implementation the local e-government and e-governance initiatives in the form of contact centers⁴, in the same context, Bernhard and Grundén, (2013) conducted a study of the implementation of two contact centers in Sweden finds a range of management and organizational issues including the self-protecting attitudes and actions of staff who feel threatened by technology.

An in-depth study conducted by Jansson (2013) analyzed local e-government implementation in a Swedish municipality and found that e-government reforms contribute to new practices, in which the development and application of IT are becoming central for local organizations and for the provision of public services, that also contribute into the reorganization of actors' roles and relationships.

In the same context, a Swedish study by Lindblad-Gidlund et al (2010), expressed that there is a need for a deeper investigation of consequences on the organizational structure of public agencies when local e-government initiatives are implemented, but it should be kept in mind that the use of data analytics brings challenges to data privacy and protection (Waidner and Kasper, 2016).

⁴ This is maybe because technology infrastructure and awareness are available in Sweden and people are familiar in using new technology.

Moving to e- government adoption context, citizens' adoption is considered a prominent signal of e- government success (Zheng et al., 2013; Gilbert et al., 2004; Warkentin et al., 2002), Carter and Belanger (2005), Carter and Weerakkody (2008) used intention of utilizing e- government as an indicator of e- government adoption, Gefen and Straub (2000) used intention to purchase (use) and intention to inquiry for evaluating e commerce/IS adoption, whereas Pavlou and Fygenson (2006) depended on assessing behaviors to identify e-commerce adoption by investigating searching information and purchasing product done by customers, as Pavlou and Fygenson used TRA (theory of reasoned action), TAM (technology acceptance model) and TPB (theory of planned behavior) models in assessing purchasing and getting information behaviors.

In this regard, Ahmad, Markkula, and Oivo, (2013) defined factors that affect user's adoption of e- government services in Pakistan as performance expectancy, effort expectancy, facilitating conditions, and social influence, and stressed that the lack of awareness, user data privacy issues, lack of appropriate support and assistance would be great obstacles in this adoption.

Finally, after browsing all those studies concerning e-government context, this work founds that there is a wide range of factors affecting e- government implementation in the shape of obstacles or barriers impeding the implementation process, or in the shape of inductive factors that enhance and boost it, this research will gather these factors discussed in the literature and classifies them into five groups of disciplines in the next paragraph.

3.6 Factors affecting e-government implementation/ Developing the Five Categories Classification Tool (FCCT)

The aim of this Section is to review the factors affecting e- government implementation, cluster them into five research areas, and develop a new tool "Five Categories Classification Tool (FCCT)", these factors obtained by using more than 200 articles, research, case studies, reports, and books from literature covering a diverse extent of differentiated countries regarding economic-levels and cultures.

Browsing literature leads to a wide range of factors that interfere e- government implementation process differs in their nature and effecting influence, belong to different science branches, and were discussed from varied points of view, thus many researchers tried to summarize those factors such as Weerakkody et al. (2011), Bonham et al. (2001) and Al-Shafi, (2009) who classified them in four wide topics: factors affect organizational, political, technological and, social subjects, this classification covers almost all factors discussed in the literature. another point of view suggested by Ashaye (2014) who presented operational and organizational, Security and trust, technological and IT infrastructure, IT literacy and human skills, and financial and economical groups as main categories contains all e- government affecting factors, a deep look at these groups observes that there are factors engaging in more than one category, such as security -as a technical IT task- can be embedded under technological infrastructure as much as -from another point of view- it could be seen as a social factor, meanwhile trust (trust extend to users' self-trust to use system and users' trust in system) belongs to social factors group which have no mention in Ashaye's study, furthermore, the importance of the availability of resources to reach a successful adoption of e- government discussed by Van Dijk et al. (2008) can spread over technological, human, and financial resources.

Depending on that, Alassaf et al. (2020) have developed the Five Categories Classification model (FCC Model) to group the factors engaging e- government implementation into five wide categories;

Political, social, Technological, Organizational, and financial, presenting almost all concerning factors found in literature, Alassaf et al. (2020) study has distinguished by adding financial factors as an independent stand-alone group because of the importance of funding and budgeting to attain successful and sustainable e- government (Al-Shafi, 2009), that the cost itself could be a big obstacle (Heeks, 2003, 2006), taking in consideration that financial issues in this context cross with political and organizational categories.

But the mentioned Alassaf et al. (2020) study ignored some important factors such as users' adoption, perceived usefulness, and perceived uncertainty which urged this research to develop the FCC Model to the Five Factor Classification Tool (FCCT) which expands the factors to contain all elements discussed in e- government aspects from more than 200 studies, researches, books, and reports, and correlate them with five tables gathers all these factors to be a ready tool for researchers in e- government field to find easily the factors engaging e- government suit their studies approach or disciplines (Political, social, Technological, Organizational and financial).

Each one of these categories forms a solid base for potential specialized studies that are concerned with the effect of one or more categories. this classification is illustrated in (Figure 4), and Tables 1- 5 describe the correlated tables.

In the following paragraphs, the five categories of factors affecting e-government implementation will be discussed in detail.

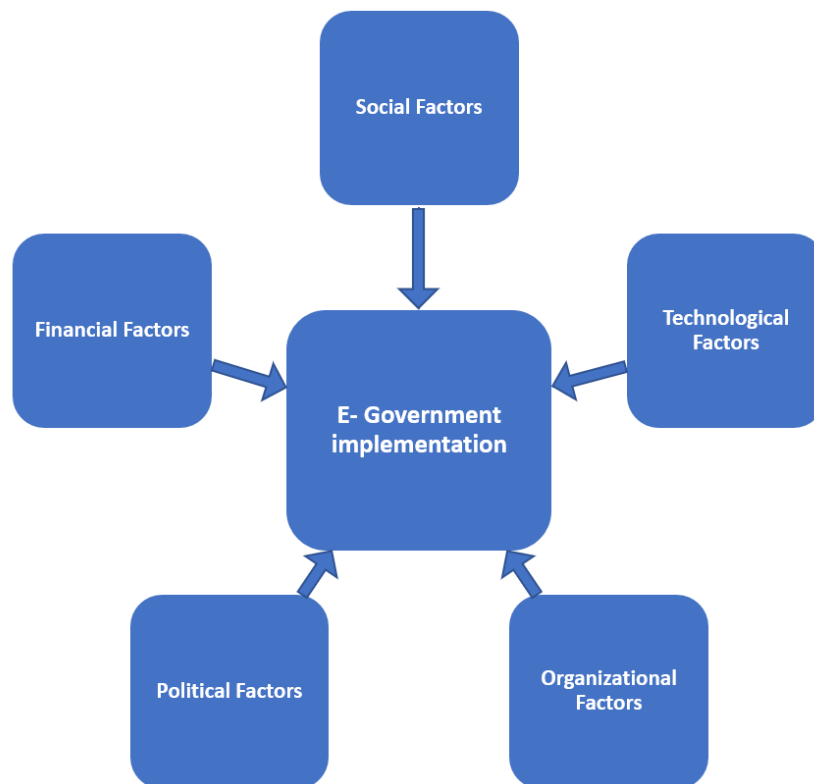


Figure 4. Five Categories Classification Tool (FCCT) Model of factors affecting e-government implementation.

Source: Author's own development (2022), based on literature readings and Alassaf et al. (2020)

3.6.1 Political factors

Successful e- government should gain Citizens' trust, this trust in e- government according to Parent et al. (2005) will not be increased without politicians' efforts to increase trust in government itself regardless of providing e- services or not, and the responsibility of building perceived trust among citizens' conscious to adopt e- government services relies on politicians as open data afforded by websites-such as e- government portal- offers political class a great tool to enhance perceived transparency of government among people (Lnenicka, and Nikiforova, 2021).

But preceding to form citizens' trust politicians should be aware of e- government importance and believe in its common benefits if they want to support e- project initiatives as Elnaghi et al. (2007) which found that the existence of believing leaderships is a main factor for such e- projects to go ahead with success, especially top leadership (Burn and Robins, 2003), this success has a high probability when leadership is strong (Kim et al., 2009; Young and Jordan, 2008).

In the same context, many studies like Toots (2019), Reddick and Norris (2013), and Heeks (2003) deemed the existence of supportive top management and political assistance is crucial in performing e- government projects, this role- according to the Council of Europe (2009)- is getting more importance in the context of e participation and e democracy, also, the involvement of top authorities may encourage e-government officials to work more confidentially (Al-Shafi, 2009).

From a similar point of view, Manda and Soumaya (2019) emphasized that political leadership has the responsibility of initializing and preparing a suitable environment for digital transformation.

From another perspective Sang et al. (2009) discussed leadership support and indicated that differences in e- government projects support among leaderships is a key factor that impacts balanced implementation among different government entities, these differences in support form a great risk to e-projects progress to reach targeted goals within planned time, especially if a change in leadership has occurred and the new leadership has less interest in e- government approach, or it doesn't consider that e-government has a high priority in the current period, particularly in the poor and developing regions. This low prioritization of e- government led researchers to propose a clear strategy toward executing e-government as a vital element pushing e-government to be in high priority.

In the same regard, Al-Shboul et al. (2014) insisted that losing a clear strategy forms a great barrier facing e-government success, this idea is discussed more deeply by World Bank (2016) focusing on the importance of adopting a strategy to engage all people of society in e- government including most vulnerable groups, and for bridging the digital divide that would appear due to the new technological applications.

Resistance to change within the political environment in Al-Shboul et al. (2014) opinion considers a vital holdback facing transformation toward e-government, resistance to change is a widespread attitude of low and medium-level politicians, especially within e- democracy scope in which Mahrer and Krimmer (2005) denoted that the enormous members of Austria's politicians are countering e-democracy very strongly, this countering engendered from fear of losing control (Bovaird and Loeffler, 2012) or/ and from power reallocating (Toots 2019; Arnstein, 1969).

Lastly, the digital transformation toward a new shape of government that is providing its services online causes a necessity for an accompanied change in regulatory, legal, and policies structure (Toots 2019; Homburg, 2008), taking in regard this change generates a new set of applications necessary for

accomplishing online transactions like electronic signatures, securing data programs to protect against viruses and hackers, and electronic crime recognitions, this new framework creates legal and structural complexity in this innovative environment (Osborne and Brown, 2011), here, at this point of transformation when the new system is set up, it shouldn't be hidden what Rashman et al (2009: 480) alluded to about politicians' effective power on policies and regulation "the influence of key actors and interests to direct or constrain outcomes".

Political factors affecting e-government implementation are summarized in Table 1., with a description of measurement and a sample of studies discussed each of them.

Table 1. Political factors affecting e-government implementation, first correlated table of FCCT model.

Factor	Description/ measures	Study/Reference
Existence of believing leaderships in e-government	Politicians themselves have to be already convinced of the importance of e-government to give proper support to its projects	Elnaghi et al. (2007).
Existence of strong leadership	Strong believing leadership boosts the success opportunity of e-government implementation.	Kim et al. (2009); Young and Jordan (2008).
Top leadership support	Support from the high level of leadership gives a push toward speeding up e-government implementation and enables to overcome legislative and financial obstacles	Heeks, (2003); Reddick and Norris (2013); Toots (2019); Council of Europe (2009).
Top leadership involvement	Top leadership involvement makes e-government officials work with more confidence.	Al-Shafi (2009).
	Political leadership is responsible for providing an environment for digital transformation and innovation.	Manda and soumaya (2019).
Variations in support among leadership	This variation in support factor affects e-government balanced implementation among different ministries or agencies.	Sang et al. (2009).
Clear strategy	lack of clear strategy as a key e-government barrier. Adopting a strategy to engage all people of society in e-government.	Al-Shboul et al. (2014); World Bank report (2016); Parent et al (2005).
	lack of high prioritization of e-Government.	Sang et al. (2009).
	Politicians have a responsibility to build perceived trust in government. e-government can't increase trust in using its services unless the politician put their efforts to raise the trust in government among citizens irrespective of e- services	Parent et al (2005).
Resistance to change	It is a common behavior among the low and medium political communities.	Al-Shboul et al. (2014)
	Opposing e-democracy	Mahrer and Krimmer (2005)
	Fears of redistribution of power	Toots (2019); Arnstein (1969).

Factor	Description/ measures	Study/Reference
	losing stature and control.	Bovaird and Loeffler (2012).
Availability of comprehensive policy, legal, and regulatory framework	New policies and legislations are convenient to changing environment created by transforming toward e-government, considering new applications needed for e- transactions such as e-signatures, protecting data from hackers, and e- crime definitions.	Toots (2019); Homburg (2008).
Legal complexity	Complexity degree of new regulations and legislations concerning e-government applications and crossing with traditional legislation.	Osborne and Brown (2011).
vulnerability to politicians' Interests and influence.	Politicians' effective power on policies, regulation and key actors, and interests to direct or constrain outcomes.	Rashman et al (2009).
Transparency	Open data afforded by websites -such as e- government portal- offers the political class a great tool to enhance perceived transparency of government among people	Lnenicka, and Nikiforova, (2021).

Source: Author's own development (2021).

3.6.2 Social factors

Since the other end of e-government applications are humans who deal with, control, design, and assess this system, human characteristics and social factors play a vital influence on e-government implementation (Hamner et al, 2010).

Starting with the concept of perceived awareness of e-government, Sang et al. (2009) noted that e-government adoption and perceived awareness are correlated positively, in the same regard, some studies concentrate on users' awareness of e- services and its stimulation effect on users toward using online services (Roblek et al., 2020; Torkzadeh and Dhillon, 2002).

Parent et al. (2005) and other researchers like Abu-Shanab (2014) Ahmad et al. (2013) stressed that the lacking of awareness/ knowledge about e-government services considers a significant obstacle to adopt e-government, this obstacle didn't stop at the awareness of services but it extends to awareness of the ease of e-participation (Toots, 2019, Voorberg et al., 2015; Roblek et al., 2020) and awareness of perceived relative advantage (Rokhman 2011).

In contrast, Zheng (2017) did not agree any importance of perceived e-benefits/ advantages effect on the usage of e-participation systems depending on their perceived utility or facilitating the use, while Panopoulou et al. (2010), Gilbert and Balestrini (2004) confirmed benefits and easiness of using e-services as an affecting factor in e- government context, but mentioned study of Zheng imputes using e-participation systems to the willingness and capacity to participate, that willingness when driven by trust considered a key factor to implement e- government successfully (Carter and Belanger, 2005).

In this context, Gilbert and Balestrini (2004) defined the factors which have a strong effect on the willingness of using governmental online services as trust, financial transactions security, time saving, and the quality of information, the influence of these factors will be discussed more thoroughly later in this paragraph.

Staying in the same line, several e-learning studies like (Alassaf and Szalay, 2020; Salloum et al., 2019; Mahmodi, 2017; Cakir and Solak, 2014; Farahat, 2012; Dabija et al., 2014) dealt with e learning as a specific example of e-services applications, those studies were concerned with factors affecting the acceptance of e-learning, and revealed additional influencing factors like intention and attitude toward e-learning.

Here, Kumar et al. (2007) found that users' acceptance of e- government and adoption of its services are affected directly by perceived usefulness, this result goes in the same line with Lin and Yu (2006) who considered perceived usefulness as a driving factor for internet adoption, and with Davis (1989) who sees -through Technology accepting model (TAM)- perceived usefulness as a vital factor of accepting information technology and it depends on a person's believing extent that using some system would enhance performance, while, perceived usefulness according to Shih (2004) is related to time and cost saving.

From another perspective, Parasuraman et al. (1988) elaborated the famous scale ServQual to measure perceived service quality, e- government as an e- services provider can be undergone to the measurements of ServQual, Generally, many studies such as Al Hujran et al. (2013), Gronierand and Lambert (2010), Lai and Pires (2010) involved with social factors influencing adopting and implementing of e-government get through this scale's dimensions, those dimensions are: tangibles, reliability, communication, responsiveness, courtesy, access, security, credibility (trust),

understanding customers and competence, taking in regards particularity features of provided e-services.

Depending on that, the perceived quality of service is very important and crucial in shaping participants/citizens' intentions toward using e-services (Shi et al., 2018; Meyer et al., 2016; Hsu et al., 2012), this notion is applicable to e-government services where the quality of information performs users' perceived reliability which is an essential dimension of service quality (Toth et al., 2018; Parasuraman et al., 2005).

To assess the reliability many studies such as Lin and Lu (2000), Delone and McLean (2003), Gilbert et al. (2004), Parasuraman et al. (2005), Collier and Bienstock (2006), Kim et al. (2006) and Kumar et al. (2007) break it into sub elements that make up information system reliability: perceived service response, integrated information, fulfillment, timelines, up-to-date information, relevant content (or linkage), accuracy, completeness, and well organized platform.

This perceived service quality may develop an e- government adoption attitude and increase using its services among citizens, this attitude toward using e- government and online e- participation is shaped by computer self-efficacy, access to technology, Internet user skills, and experience of the internet and ICT (Toots, 2019; Van Dijk et al., 2008).

As e- government provides its services online it is important to give attention to Zeithaml, Parasuraman, and Malhotra's (2000) study that defined the dimensions of e- service quality that developed originally from SERVQUAL (service quality) scale, the mentioned study outlined measurement items of service quality in general, also, it is useful to point out that SERVQUAL has been developed through several studies and researches led by Parasuraman (Parasuraman et al., 1985; 1988; 1991; 1993; 1994a; 1994; 2000; 2005) those studies refined dimensions of e- service quality to: Reliability, Responsiveness, Access, Flexibility, Ease of navigation, Efficiency, Assurance/trust, Security/privacy, Price, knowledge, Site aesthetics: Appearance of the site, Customization/personalization.

From another point of view, it is important to mention that "attitude" considers by many studies such as Alomari et al. (2009) and Shareef et al. (2011, 2018) as a key factor of e-government adoption, in this context, Eggers (2004) finds that governments can enhance citizens' attitude toward e-government systems by offering appropriate incentives to switch from conventional channels to the digital ones, for example presenting a discount or rebate for every online transaction or adding a slight increase of conventional channels cost.

To discuss aspects of influential social factors in e- government field, Basamh et al. (2014) and Bernhard (2014) presented trust as a substantial factor shaping citizens' intentions and willingness toward adopting e- government services, since trust in this context runs in a virtual environment in which citizens have very few tangibles to ensure performance and credibility of the service provider (Urban et al, 2000), this perceived trust in citizens' perception according to Olah et al., (2019), Ahmad et al. (2013), Shareef et al. (2011, 2018), Al-Adawi et al. (2005), Parent et al. (2005) engaged with uncertainty, risk, privacy, and security, those constructs may cause a shortage in trust to use e- services (Al-Shboul et al., 2014) and this lack of trust may originally be derived from a weak trust in government in general (Alomari et al., 2009).

Based on Belanger and Carter (2008) and Schaupp and Belanger (2005) studies, perceived security grants the users of web services a feeling of risk avoidance encouraging them to use virtual transactions, this perceived risk has different impacts on users regarding their personalities (Pires et al., 2004; Ueltschy et al., 2004) and diverse from performance and the security of financial transaction risks to convenience, psychological, social, and aggregate risks (Kumar et al., 2007), furthermore Dimitrova and Chen (2006) and AGIMO (2003) suggested perceived uncertainty as an influential factor on e- government adoption, this factor beside perceived usefulness were missed in Alassaf et al. (2020) FCC Model as a comprehensive model of factors affecting e- government.

In the same line of security, risk avoidance, and uncertainty we can find protecting customers' privacy as an important factor affecting customers' interaction online because they have doubts that their secret data and personal information may be misused or disclosed during the use of the online applications, (Brown and Muchira, 2004; Ranganathan and Ganapathy, 2002), this idea empathizes on Angst and Agarwal (2009), Parasuraman et al. (2005), Yoo and Donthu (2001) findings about considering perceived privacy as one of the key determinants of customers' using the internet to perform their interactions online since they prefer to avoid privacy risk.

Moving to another social element that influences e- government implementation, Tse et al. (1988) defined consumer's satisfaction as a reaction to her/ his assessment of perceived contradiction resulting by comparing prior expectations and actual performance, meanwhile Weerakkody et al. (2014) after a deep study of the literature covered 147 articles and studies in regards of satisfactions and adoption of e-government, framed the components of e-government satisfaction and adoption as perceived risks, trust, attitudes, quality of information, quality of systems and services, perceived easiness of using e- services, perceived benefits, and overall satisfaction, here, Kumar et al. (2007) and Shankar et al. (2003) agreed that users' overall satisfaction is an essential indicator of successful e- government implementation process.

On another hand, Rokhman (2011), and Carter and Belanger (2005) reported that the compatibility of virtual systems with citizens' beliefs, values, and attitudes is a good anticipator of their intentions to utilize e-government services, and thus success in adopting these systems.

Once government provides its e-services and citizens have to deal with it, an insistent question raises concerns about citizens' ability and knowledge to handle the new technology, as Basamh et al (2014) stated that computer literacy considers vital in affecting e-government implementation, on a wider view, Alomari et al. (2009) expand this factor to encompass the educational level of citizens not only their computer skills, in another approach Shareef et al. (2011, 2018) considered perceived ability to use ICT as a pre condition for users to adopt e- government services.

Furthermore, very important drives that affect the e-government implementation process, are social influence and perceived image of the e-government users (Al-Shboul et al., 2014; Phang et al., 2005; Tung and Rieck, 2005) this image creates a feeling among e-government users that they are superior to others in the society.

It is apparently when e- government starts its projects it widely uses new and high technology in its practices which can't be afforded by all groups in society, especially in developing countries and most vulnerable groups, and would create a digital divide (United Nations, 2016), this divide becomes an enormous barrier toward e-government adoption, since citizens to reap the benefits of e-services they should have access to the internet (Al-Shafi, 2009).

Social factors affecting e-government implementation are Summarized in Table 2., with a description of measurement and a sample of studies discussed each of them.

Table 2. Social factors affecting e-government implementation, Second correlated table of FCCT model.

Factor	Description/ measures	Study/Reference
Perceived Awareness	Affect e-government adoption	Shareef et al. (2011, 2018); Sang et al. (2009).
	Lack of knowledge/ Awareness about e-government services is a significant obstacle to adopt e-government	Shboul et al. (2014); Ahmad et al. (2013)
	Awareness of the ease of e-participation	Toots (2019); Voorberg et al. (2015); Panopoulou et al. (2010); Gilbert and Balestrini (2004)
	Awareness of relative advantage/ Benefit for user	Rokhman (2011); Panopoulou et al. (2010); Gilbert and Balestrini (2004)
	Awareness of the value of e-government will create the motivation to use e-government services	Torkzadeh and Dhillon (2002).
Willingness/ intention to use e-government	e-participation usage of e-participation systems imputed to the willingness and capacity to participate	Zheng (2017)
	Willingness, when driven by trust, considered a key factor for successful e-government implementation.	Carter and Belanger, (2005).
	Willingness to use e-government is affected by time saving, financial security, trust, information quality	Gilbert and Balestrini (2004).
	Attitude toward to e- services is an affecting factor of successful e- initiatives, e- learning as an example.	Salloum et al. (2019); Mahmodi (2017); Cakir and Solak (2014); Farahat (2012).
Perceived Quality of e- service	Information quality, and its deterrents: Accuracy, Relevant content, Up-to-Date Information, Fulfillment, Linkage, Completeness, Integration, Organization, Timelines, and Perceived Service Response are performing a Perceived Reliability which is a dimension of Service Quality that, in turn, influences citizens to use e-government services	Lin and Lu (2000); Delone and McLean (2003); Gilbert et al., (2004); Parasuraman et al., (2005); Collier and Bienstock (2006); Kim et al., (2006); Kumar et al., (2007); Shareef et al., (2011, 2018).
Attitude	Attitude is considered an affecting factor in adopting e-government.	Alomari et al., (2009); Shareef et al. (2011, 2018).
	Attitude to use e-government systems can be enhanced by giving sufficient Incentives: Discount for completing transactions online or Raise the cost of using traditional channels.	Eggers (2004)

Factor	Description/ measures	Study/Reference
	Attitude toward using e-government shaped by: Computer self-efficacy, Access to technology, Internet user skills, and experience of the internet and ICT	Toots, 2019; Al-Shboul et al., 2014; Van Dijk et al., 2008)
Perceived Trust	Trust is an important factor forming citizens' adoption of e- services	Basamh et al., (2014); Bernhard Irène, (2014)
	Ensuring the service provider's credibility and performance	Urban et al, (2000).
	Building Perceived trust is depending on uncertainty, security, privacy, and risk.	Al-Shboul et al. (2014); Ahmad et al., (2013); Shareef et al., (2011, 2018); Al-Adawi et al., (2005); Parent et al., (2005).
	Lack of trust may be derived from a weak trust in government in general.	Alomari et al. (2009).
Perceived Risk	Perceived risk differs from one user to another depending on user characteristics. It is diverse from financial risk, performance risk, psychological risk, social risk, convenience risk, and overall risk.	Pires et al. (2004); Ueltschy et al. (2004). Kumar et al. (2007).
Perceived Security	Perceived security can give the users of web services a kind of risk avoidance feeling to go on using virtual transactions	Belanger and Carter (2008); Schaupp and Belanger (2005).
Perceived Privacy	Privacy is a key determinant for customers using the internet to perform interactions online since they feel they are at a privacy risk.	Angst and Agarwal (2009); Parasuraman et al. (2005); Yoo and Donthu (2001).
	Users of e- services doubt that their secret data and personal information may be disclosed, or misused.	Brown and Muchira, 2004; Ranganathan and Ganapathy, 2002).
Perceived Uncertainty	The absence of personal contact in e- government services and uncomfortable feelings in the virtual environment produce uncertain results. Perceived uncertainly is an influential factor on e- government adoption, this factor is missed in Alassaf et al. (2020) FCC Model as a comprehensive model of factors affecting e- government	AGIMO (2003); Dimitrova and Chen (2006); Kumar et al. (2007).
Satisfaction of e- government.	Overall satisfaction is an influential actor in e- government implementation, e- services.	Kumar (2007); Shankar et al. (2003).
	Satisfaction with e-government is affected by perceived ease of use, trust, perceived usefulness, overall satisfaction, service quality, system quality, information quality, perceived risk, and attitude	Weerakkody, V et al. (2014)
Compatibility of e- government systems	Compatibility of the e-government system with citizens' beliefs, values, and attitudes is a significant indicator of citizens' intention to use state e- government services	Rokhman (2011); Carter and Belanger (2005).
Perceived usefulness	Saving time and cost, easiness in accomplishing tasks, useful content, and increasing effectiveness form perceived usefulness in users' perception.	Davis (1989); Shih (2004); Lin and Yu

Factor	Description/ measures	Study/Reference
	Perceived usefulness is an influential factor on e-government adoption, this factor is missed in Alassaf et al. (2020) FCC Model as a comprehensive model of factors affecting e- government	(2006); Kumar et al. (2007).
ICT Knowledge and	Computer literacy considers a vital factor that affects e-government implementation.	Basamh et al (2014)
Education Level	The educational level of citizens besides computer skills affects using e- services.	Alomari et al. (2009)
Perceived ability to use ICT	Perceived ability is an affecting condition on user's willingness to adopt e-government services.	Shareef et al. (2011,2018)
Perceived Image of using e-government.	This image creates a feeling among citizens who use e-government that they are superior to others in society.	Al-Shboul et al. (2014); Phang et al. (2005); Tung and Rieck, (2005).
Digital Divide	Digital Divide between people who can access the internet/ technology and who can't, those will be unable to benefit from e- services	United Nations, 2016a; Al-Shafi, S, (2009).

Source: Author's own development (2021).

3.6.3 Technological factors

Anthopoulos et al. (2007) and Layne and Lee (2001) supposed that as soon as governments present their e-governments for public use, all beneficiaries expect they can interact through one integrated gateway, which means all varied governmental entities should integrate their services within one e-government portal and present their services for use through it. This demands the need for systems capable of integration (Baum and Maio, 2000), and thus the need for one integrated system reduces online functionalities (Al-Khoury and Bal, 2007), provides a standardized and compatible system capable to perform different tasks seamlessly, since engaging incompatible systems (hardware and software) from various government entities may cause malfunctions in working and interoperating together (Al-Shafi, 2009). On the other hand, standards help the systems' developers to design services in different ways and enable these services to be well-suited and operate compatibly (Keen, 1992; Gal et al. 2013).

According to many studies, the lack of adequate ICT /IT infrastructure poses a key factor that prevents e- government implementation from success (Al-Shboul et al., 2014; Nabafu and Maiga, 2012; Sang et al., 2009; Bwalya, 2009), in this context, Rokhman (2011) proposed infrastructure availability as a pre-condition precedes setting up an e- government, here, Shareef et al. (2011) explained infrastructure availability as availability of technological resources; PC's, internet connection and other tech-infrastructure which perform a key condition in setting up e- government.

Furthermore, Basamh et al. (2014) debated that even providing sufficient technological infrastructure is a prerequisite term to start e-transformation, but its availability won't be sufficient without designing e-services to be utilized by users in an easy and accessible way, this debate drove Alomari et al. (2009) to declare accessibility as a vital factor that should be a priority during planning websites design, to reach eventually an easy-learned website for users with an easy-accessed information (OECD, 2003), also, e- government websites should be designed professionally to enhance effectiveness, productivity, and to perform tasks easier and better (Davis,1989).

In the same context, Toots (2019) extended the focus from only designing a proper website to designing a system that covers the whole e-government aspects, which leads to a successful implementation if the e-system has features that boost interactivity and useability, accept developments and updates, and meet circumstances of all citizens groups especially the most vulnerable people including special audiences and minority groups (Panopoulou et al., 2010, 2014).

Staying in the same regard, Kumar et al. (2007) described a successful e- government system as flexible, easy for a user to become skillful, controllable, and understandable, also, Bwalya (2009) suggested that the e- government system should provide its content in English beside local languages, whereas Jansson (2013) focused on the need of updating system's practices continuously since new practices become more centered on IT continuous development and applications. Summarizing previous ideas Pardo et al. (2011), Weerakkody and Dhillon (2008) alluded that e- government systems should be interoperable to satisfy citizens' needs and wants.

From another point of view, designers, when they are building the system, should be careful of unrealistic expectations which become a barrier to the implementation of e-government (Toots, 2019; Susha and Gronlund, 2014).

Referring to the social factors paragraph, security and privacy of e- services were central factors among most of the studies, especially the threat of hackers and dangerous exposure that comes from using data analytics, which brings risks of privacy violation and unprotected data (Waidner and Kasper, 2016). this puts on designers the burden to solve these weaknesses technically and provide a trusted and secure medium, otherwise, it will be a great hindrance to implementing e-government (Al-Khoury and Bal, 2007; Conklin and White, 2006).

Similar to the discussions dealing with social factors, where perceived service quality obsesses a vital role in e- government adoption, the technological perspective values the technologies' quality by evaluating: control capabilities, preceding experiences, delivery speed, simplicity of technology's applications, reliability, users' enjoyment features, the extent of necessity to seek for assistance from employees of the service, and overall services' quality (Dabholkar, 1996).

At last, Abu-Shanab (2014) and Ahmad et al. (2013) discussed the necessity of the existence of reliable technical support from government website support.

Technological factors affecting e-government implementation are summarized in Table 3., with a description of measurement and a sample of studies discussed each of them.

Table 3. Technological factors affecting e-government implementation, third correlated table of FCCT model.

Factor	Description/ measures	Study/Reference
Availability of Integrated System.	The integrated system provides: less online functionalities, compatible and standardized (IT) systems.	Baum and Maio (2000); Al-Khoury and Bal (2007).
	Systems Compatibility Incompatible hardware and software among different government agencies cause a malfunction in working together.	Al-Shaf (2009).
	Availability of one integrated gate way through one-stop points of access for citizens and other beneficiaries.	Layne and Lee, (2001); Anthopoulos et al., (2007).
	Standardized Systems: Helps designers to develop their services differently from each other and enables these services to be well-suited and compatible with each other.	Keen (1992); Yonazi et al. (2012)
Availability of Adequate IT/ICT Infrastructure	Lack of adequate IT/ICT infrastructure poses a major factor preventing e-government implementation from success.	Al-Shboul et al. (2014); Nabafu and Maiga (2012); Sang et al. (2009); Bwalya (2009).
	Infrastructure Availability is a precondition for implementing e-government	Rokhman (2011).
	Infrastructure Availability is: Availability of technological resources; computers, internet connection, and other tech infrastructure, perform a key condition to realize e-government	Shareef et al. (2011).
	Accessibility: when Adequate Infrastructure is available it makes e- services easy and accessible to the beneficiaries from a technological perspective anytime and anywhere.	Basamh et al. (2014)

Factor	Description/ measures	Study/Reference
System Design (website, platform...)	Easy and Accessible to information. Increase Productivity, Effectiveness, and makes Job Better and Easier.	Alomari et al. (2009); OECD (2003); Davis (1989); Toots (2019).
	Useable, Interactive, Adaptable to technological developments, and meets particular needs and circumstances of the targeted audience (including special audiences and minority groups).	Panopoulou et al. (2010, 2014).
	Controllable, Understandable, Easy for a user to become skillful, and Flexible.	Kumar et al. (2007).
	Providing its content in English besides the local languages.	Bwalya (2009).
	Updating its practices continuously.	Jansson (2013).
	System Interoperability: systems should be interoperable to meet citizens' demands.	Pardo et al. (2011); Weerakkody and Dhillon (2008)
Technical Support	There is a necessity for Technical Support from government website support.	Abu-Shanab (2014); Ahmad et al. (2013).
Unrealistic Expectations	Unrealistic Expectations of e-government system are a barrier to its implementation.	Toots (2019); Susha and Gronlund (2014).
Availability of Trusted and Secure medium.	Solving security and privacy concerns technically.	Al-Khouri and Bal (2007); Conklin and White (2006).
	Data Analytics: brings challenges to data privacy and protection.	Waidner and Kasper (2016).
Quality of Technology	Expected: Speed of Delivery, Ease of Use, Reliability, Enjoyment, Control, and Expected Service Quality. Prior Experience, Need for Interaction with the employee of the service.	Dabholkar (1996).

Source: Author's own development (2021).

3.6.4 Organizational factors

Institutional theory supposed that organizational change is agreed upon by various stakeholders when they expect perceived usefulness from this change (Lawrence and Suddaby, 2006). In other words, if e- government succeeded in rising perceived benefits in the minds of employees working in different governmental entities, it would decrease the resistance to change which considers a big obstacle toward e- government implementation (Al-Shboul et al., 2014) because of fears of change in public sector organizations (Chadwick, 2011).

In this context, some employees may act with an attitude showing self-protecting behavior when a threatening feeling arises that their interests are endangered by the new technologies (Bernhard and Grundén, 2013). This feeling comes when an employee suspects that he/ she or one of the colleagues will be laid off, or maybe affects her/ his influence and power used to spread over the conventional process of the job (Al-Shafi, 2009), or when middle managers perceived that their role and numbers are in declining as the new technology presents its services (Burn and Robins, 2003; Dopson and Stewart, 1993). These examples of feelings and more alike will produce a negative attitude from employees (Weerakkody and Currie, 2003).

Different researchers identified various origins of organizational resistance to change arising from risk- avoidance manners common in public entities (Voorberg et al., 2015), the power of inherent traditions of governing states (Bekkers et al., 2013), internal anchoring, and organizational framework (Bernhard, 2014; Bernhard and Grundén, 2013), this resistance to change within government entities described by Toots (2019) as institutional-resistance emerging from the public sector context and cause e-participation systems failure.

To overcome the obstacles that emerged from the above-discussed institutional resistance to change, Nabafu and Maiga (2012) suggested to promote awareness among politicians and public employees about the relevancy and usefulness of e-government, by illuminating the importance of saving time to accomplish tasks compared to the conventional paper- based way (Carter and Belanger, 2005; Gilbert et al., 2004; Wagner et al., 2003), focusing on perceived functional benefits (Shareef et al., 2011, 2018) and reduction in service rendering cost (Tung and Rieck, 2005).

keeping in mind discussions in the Social factors paragraph about raising citizens' awareness of e-government importance by deploying campaigns convincing citizens to participate more in e-government services (Al-Shafi, 2009).

Those campaigns for increasing awareness of e- government are one of the goals of organizational planning and strategies. In this regard, strategic plans to engage citizens in e- government acceptance process are important organizational goals for accomplishing successful e-government projects (Bernhard, 2014), and would be vital barriers causing severe failure of those projects when they lack to clear strategy (Al-Shboul et al., 2014), careful planning based on precise goals (Paroski et al., 2013), suitable change management methods, good framing of e-government practices (Bwalya, 2009), citizen centric (Undheim and Blakemore, 2007; Basu, 2004), training plans for citizens (Nabafu and Maiga, 2012), internal plans for training employees within organizations (Rokhman, 2011; Heeks, 2006), high prioritization of e- government (Sang et al., 2009), prioritization of deliverables (Lee et al., 2008; Pilling and Boeltzig, 2007), having ambiguous policies and rivaling goals (Osborne and Brown, 2011), and finally lacking to balancing the diversity of the interests of different stakeholders (Anthopoulos et al., 2016; Dwivedi et al., 2015) since involvement of huge number of organizational

stakeholders with conflict relationships is a distinguished feature of e-government ventures (Sarantis et al., 2010).

Designing organizational strategies to establish successful e- government needs to elaborate a strategic alignment framework and coordination among different agencies responsible for different information systems (Fedorowicz et al., 2009) by proposing national e-strategies (Basu, 2004) that should take into regard the variant future needs of governmental entities (Marchewka, 2006).

As long as the implementation of e-government projects is accomplished in the long term, this calls for proposing a suitable architecture of work outline for e- government to support and align that implementation (Ebrahim and Irani, 2005).

Focusing back on internal organizational training, Heeks (2006) confirmed the necessity of planned training for lifting human capabilities to fit e- government systems.

In this regard, many studies browsed barriers confronting e-government success relating to IT human resources in different cases, summarize in the lack of IT literacy and skills (Meyer and Hamilton, 2019; Basamh et al., 2014; Sang et al., 2009; West, 2004), insufficient skilled human resources (Al-Shboul et al., 2014), deficiency in market of well-trained IT employees, scarcity in technical and relevant IT skilled staff, lack of program knowledge (Ashaye, 2014), low managerial and technical backgrounds (Paroski et al., 2013), a high-rate turnover among the information technology official employees (Sang et al., 2009), and insufficient skills in private sectors (Dada, 2006).

From another perspective, looking deeply through the institutional environment drove researchers to conclude that organizational culture can encourage or impede the execution of governmental e-initiatives (Kim et al, 2007) and that the existence of supportive management boosts accountability, effectiveness, and efficiency of the proposed e- government systems (Chang et al., 2019), especially when this support comes from the top management which is highly considered a crucial factor in any successful project (Young and Jordan, 2008).

Finally, what can slow down and prevent a successful e- government implementation from an organizational point of view is the traditional institutional structure which lacks flexibility in the government-wide frameworks (Field et al., 2003), this notion leads to the need for human capital development, administrative support for organizational change (Ashaye, 2014; Eynon and Dutton, 2007), and collaborative partnership between private and public sector (Field et al., 2003), when this collaboration is lost it causes failure of e-projects (Al-Shboul et al., 2014).

Organizational factors affecting e-government implementation are summarized in Table 4., with a description of measurement and a sample of studies discussing each one of them.

Table 4. Organizational factors affecting e-government implementation, fourth correlated table of FCCT model.

Factor	Description/ measures	Study/Reference
Resistance to Change	Organizational Resistance to Change is a big obstacle toward e-government implementation.	Al-Shboul et al. (2014).
	Fears of Change in public sector organizations cause Resistance to Change	Chadwick (2011)
	Self- Protecting Attitude shown by Some employees when they feel threatened by technology, and probability of Losing their jobs, Authority, and Power.	Bernhard and Grundén, (2013); Al-Shafi (2009)
	Negative Attitude from Middle managers due to the declining in the role and numbers, because of e-government technology.	Burn and Robins (2003); Weerakkody and Currie (2003); Dopson and Stewart (1993)
	Risk-Averse Culture of public sector organizations.	Voorberg et al. (2015).
	Influence of State and governance traditions.	Bekkers et al., (2013).
	Institutional Resistance/ Organizational settings and Internal Anchoring.	Toots (2019); Bernhard (2014); Bernhard and Grundén, (2013).
	Different Actors accept organizational change when they feel it is beneficial to them.	Lawrence and Suddaby (2006).
Administrative Support	Administrative Support of organizational change	Ashaye (2014); Eynon and Dutton (2007)
Organizational Benefits and Relevancy of e-government	Organizational Benefits of implementing e-government: Saving time to perform tasks. Reduction in service Rendering Cost. Perceived functional benefits.	Carter and Belanger (2005); Gilbert et al. (2004); Wagner et al. (2003); Tung and Rieck, 2005); Shareef et al. (2011).
Planning, Goals, and Strategy	Planning, Goals, and Strategy are important organizational factors in e-government implementation.	Bernhard (2014)
	develop a strategic alignment framework and coordination among different agencies' information systems.	Fedorowicz et al. (2009)
	Proposing National e- strategies which	Basu (2004).
	Meeting Future Needs of the organizations.	Marchewka (2006)
	Raising awareness of e-government as a successful key factor for adoption of e-government by organizing campaigns to deploy e- services	Al-Shafi (2009)
	Spreading sensitization to the relevancy and benefits of e-government is important to succeed in adopting e-government.	Nabafu and Maiga, (2012).
	Lack of Clear Strategy can cause failure to e- projects	Al-Shboul et al. (2014)
	Lack of Careful Planning based on Precise Goals	Paroski et al. (2013);
	Lack of proper Change Management Procedures, Non-Contextualization of e-government Practices.	Bwalya (2009);
	Lack of Citizen Centric.	Undheim and Blakemore (2007); Basu (2004);
	Lack of Training plans for citizens	(Nabafu and Maiga, 2012)

Factor	Description/ measures	Study/Reference
	Lack of Training plans for employees within organizations	Rokhman (2011); Heeks (2006)
	Lack of High Prioritization of e-government	Sang et al. (2009).
	Lack of Prioritization of deliverables.	Lee et al. (2008); Pilling and Boeltzig, (2007).
Ambiguous Policies	Ambiguous Policies and Competing Objectives are	Osborne and Brown (2011).
Competing Objectives		
Balancing various Interests	involvement of a large number of organizational stakeholders with conflict relationships	Sarantis et al. (2010).
	Pressure to balance the interests of various stakeholders.	Anthopoulos et al. (2016); Dwivedi et al. (2015).
Availability of Architecture Framework	Appropriate Architecture Framework for e-government to support and align e-government implementation in the long term.	Ebrahim and Irani, (2005).
IT literacy and skills	lack of IT literacy and skills	Basamh et al. (2014); Sang et al. (2009); West, (2004)
Skilled Human Resources	Lack of Skilled Human Resources in Organizations and Agencies.	Al-Shboul et al. (2014),
	Shortage of well-trained IT staff in the market	Ashaye (2014)
	Lack of Employees with Relevant IT Skills and Technical Staff.	
	Lack of Program Knowledge within Organizations and Agencies.	
	Low managerial and technical backgrounds.	Paroski et al., 2013),
	Inadequate Skills in the Private Sectors. all considered important factors affecting e-government implementation	Dada (2006).
	High Turnover Rate among government information technology staff.	Sang et al. (2009).
Organizational Culture	organizational culture can encourage or impede e-government implementation process.	Kim et al. (2007).
Management Support	Management Support has a consistent relationship with efficiency, effectiveness, and accountability of the proposed system	Chang et al. (2019).
	Top Management Support which considered a critical success factor in project management.	Young and Jordan (2008).
Traditional Organizational Structure	Traditional Organizational Structure lacks flexibility in the government-wide frameworks.	Field et al. (2003).
Collaborative Partnership with the Public sector	Collaborative Partnership between Private and Public sector.	Field et al. (2003).
	Loss of collaboration may cause e- projects to fail.	Al-Shboul et al., 2014).

Source: Author's own development (2021).

3.6.5 Financial factors

This paragraph is gathering the most important financial affecting factors discussed in the literature in e- government regards.

Paroski et al. (2013), Nabafu and Maiga (2012), Eyob (2004), and many other studies described financial constraints and financial resources as essential factors concerning e- government domain.

A lot of researchers in the e- government field of study such as Rokhman (2011), Alomari et al. (2009), Bwalya (2009), Sang et al. (2009), Layne and Lee (2001), Lentner et al. (2019) consider sufficient infrastructure availability and accessibility as necessary conditions for any e-government initiative, regardless of being technological, organizational, human infrastructure, in another hand much fewer studies discussed the high cost of this infrastructure and supplying resources that considered a challenging barrier confront initiating e- government (Basamh et al., 2014).

Keeping in mind that investments in e- government are strategic activities and work into the longer term (Ubaldi 2011), therefore, governmental finance for these investments works also under long- run conditions and needs to seek national sources for funding (Madon et al., 2007). This reframes a barrier to implementing these e-government initiatives by posing the difficult question of how to provide uninterrupted secured funding for these initiatives along the long-timeline in a high-pressure environment that pushes the public sector to minimize expenditures (Ojha and Pandey, 2017). This factor was also discussed by Weerakkody and Haddadeh (2015) study which declared that providing long term financial support is essential for successful e- government initiatives.

In other words, e- government projects call for a long term investment unaccompanied with profits or direct revenues with a high-risk of failure. here, Heeks (2001) found that 20- 25 % of these projects ended up totally with no success, whereas 33- 60% continued partially, failing to achieve all goals.

In the same regard, Standish Group Report (2009) found that just 32% of e- government initiatives achieve targeted goals within the planned budget and timeline.

The previous findings highlight a high-risk of losing many investments in e-government, this urged OECD (2001) to suggest a solution that recommends avoiding large IT projects regarding e-government projects, and instead, carrying out small short-run projects with high-feasibility, keeping in mind that large e- government projects are highly subject to financial failures.

Furthermore, financial funding for e- government projects is similar to other large governmental projects that need financial collaboration from the private sector. Privat sector contribution differs among countries regarding their development level, since, from one side, developed countries have an active private sector that contributes to the public sector in financing massive governmental ventures, and from another side, the public sector within developing countries provides financial resources for the vast majority of large projects (Benoit, 1996).

In the same context, Nkohkwo and Islam (2013) noticed that central governments are the key source of financial support in public sector organizations. This puts challenges on the sustainability of e-government initiatives, in the shape of budgetary barriers (Field et al, 2003). Aligning with this notion, public private partnership (PPP) presents a flexible innovative financial structure for projects, but the private sector funding degree drive government to other problems; the control degree of private partner over the services, services' charges, management, and the ownership of assets which may be

subjected to public oppose (especially if there is a foreign investment) and may confront complexity in transactions and arrangements between the two sectors (Ojha and Pandey, 2017, Sitenko and Vasa, 2018).

From another perspective financing governmental e- projects through the private sector has many benefits in the opinion of Ojha and Pandey (2017) such as taking investment’s optimized-decisions, risk-reduction, optimal-structure of resources provision, and answering funding questions of e-governance initiatives.

Afterward, failing in e-projects at any point and even if its implementation stopped, there still be costs of managing an IT infrastructure that has non-integrated structure, in addition to incompatible/ conflict systems and repeated data (Al- Shafi, 2009). This aligns with Ashaye (2014) ideas that expanded evaluating financial barriers and problems of funding e-government initiatives from just installation cost problems to cover the expenditure of: running, upgrading and maintaining e systems, deploying professional IT contractors, employees and consultants, training, and research and development.

Those above-mentioned expenditures take more importance after the successful installation of an e-project and degrading them will expose the project to a severe possibility of failure, as Joshi and Islam (2018) -in explaining e- government maturity model in regards of e sustainability- considered post costs for maintaining e- projects as vital factors of a sustainable e- government while Al-Shboul et al. (2014) only took operating expenses and budgets into consideration.

Financial factors affecting e-government implementation are summarized in Table 5., with a description of measurement and a sample of studies discussed each of one of them.

Table 5. Financial factors affecting e-government implementation, correlated table of FCCT model.

Factor	Description/ measures	Study/Reference
Availability of Financial resources	Financial resources and financial constraints are important affecting factors in e-government implementation process.	Paroski et al. (2013); Nabafu and Maiga (2012); Eyob (2004).
High Infrastructure Cost	High infrastructure cost is one of the barriers that prevent initiating e-government.	Basamh et al. (2014).
High e-government Implementation Cost	Operation costs and budgets	Al-Shboul et al. (2014)
	Cost of: Installation, Operation, Maintenance and Upgrading of ICT systems, Employment of IT Professionals, Training, System Development, and Consultancies.	Joshi and Islam (2018)
Long term Financial Support	Long term financial support from the government needs to develop indigenous funding sources.	Weerakkody and Haddadeh (2015), Madon et al. (2007).
	Providing a secured and continued project funding over a long term time-frame.	Ojha and Pandey (2017).
High Risk of Failure	High Risk of Failure of e-government projects.	Heeks (2001); Standish Group Report (2009).
Size of e- projects	Large e- projects have a big risk of failure; those may be a barrier facing e-government implementation.	OECD (2001)
Budgetary Barriers	Budgetary barriers: central governments are the main source of finance of e- projects, this puts challenges toward sustainable implementation of e-government initiatives	Nkohkwo and Islam (2013); Field et al. (2003).

Factor	Description/ measures	Study/Reference
	Private Sector Collaboration	Benoit (1996).
Private sector Collaboration	<p>Public private partnership provides:</p> <p>Flexibility of innovatively structuring the financing of project.</p> <p>The public opposes the control of private partner over the services provided, tariff charged, and of assets ownership.</p> <p>Complex transactions, arrangements between private and public sectors.</p> <p>Optimizing Investment Decision Making.</p> <p>Reducing risk. Optimum Structure of Resources.</p> <p>Solutions for funding problem of e-governance projects.</p>	Ojha and Pandey (2017)

Source: Author's own development (2021).

4. HYPOTHESES OF THE RESEARCH

In the literature review, paragraph 3, the research collected Social factors affecting e-government implementation worldwide and presented them through the FCCT model and the correspondent social table.

The study found 17 social factors impact the e-government fall into 6 main themes those are; Personal Security Feelings (Trust, Risk, Security, Privacy, Uncertainty), Personal Knowledge (Awareness, ICT knowledge, Ability to use ICT, Education level), Personal Assessment of Syrian e-government (Service Quality, Satisfaction, Compatibility, Usefulness/Benefit), Perceived Image, Personal Response (Attitude, Intention), and Digital Divide.

To define exactly which Social factors affect Syrian national e-government implementation, this study decided to evaluate each of the six main Social themes (containing 17 factors) that interfere with e-governments in the Syrian context, which results in Six main hypotheses and 17 sub-hypotheses stated as follows.

H1: Citizens' Personal Security Feelings affect e-government implementation in Syria.

H1.1: Perceived Trust is an affecting factor of e-government implementation in Syria.

H1.2: Perceived Risk is an affecting factor of e-government implementation in Syria.

H1.3: Perceived Security is an affecting factor of e-government implementation in Syria.

H1.4: Perceived Privacy is an affecting factor of e-government implementation in Syria.

H1.5: Perceived Uncertainty is an affecting factor of e-government implementation in Syria.

H2: Citizens' Personal Knowledge affects e-government implementation in Syria.

H2.1: Perceived Awareness is an affecting factor of e-government implementation in Syria.

H2.2: ICT Knowledge is an affecting factor of e-government implementation in Syria.

H2.3: Perceived Ability to use ICT is an affecting factor of e-government implementation in Syria.

H2.4: Education Level is an affecting factor of e-government implementation in Syria.

H3: Citizens' Personal Assessment of Syrian e-government affects its implementation.

H3.1: Perceived Service Quality is an affecting factor of e-government implementation in Syria.

H3.2: Citizens' Satisfaction is an affecting factor of e-government implementation in Syria.

H3.3: Perceived Compatibility (personal compatibility) is an affecting factor of e-government implementation in Syria.

H3.4: Perceived Usefulness/ Benefit is an affecting factor of e-government implementation in Syria.

H4: Perceived Image of using e-government an affecting factor of e-government implementation in Syria.

H5: Syrians' Personal Response toward e-government effects e-government implementation in Syria.

H5.1: Citizens' Attitude is an affecting factor of e-government implementation in Syria.

H5.2: Citizens' Intention to use e- government is an affecting factor of e-government implementation in Syria.

H6: The Digital Divide is an affecting factor of e-government implementation in Syria.

5. SYRIAN E- GOVERNMENT INITIATIVE

Syrian e- government initiative is still young and in its first steps, it provides its services through the website “Syrian e- Gov Web Portal” in both Arabic and English.

The main goal of e- government services is to make citizens and businesses familiar with the services provided by different Syrian governments ministries, agencies, and organizations, also announcing the conditions, documents, and fees necessary to accomplish these services in an appropriate organized step-by-step way, as this portal provides in addition to general information about 2552 governmental documents relating to services conditions and fees (Syrian e- Gov Web Portal, 2023), but various Syrian ministries are still working on data entry and data verification for existing services and information as mentioned on the Syrian e- government web portal.

Most of the services provided by this portal are in the first level of e- government’s maturity stages due to Layne Lee (2001) Model which is “Cataloguing” as e- government website is providing just information with little opportunity for two-way communication via email and registration for some services.

Nevertheless, there is recognized progress in providing some services electronically as paying bills such as electricity, phone, internet, and some fees such as registering fees of some universities like Syrian Virtual University by using ATMs, bank transfers of Syrian Commercial Bank, or some limited mobile paying applications provided by mobile services providers, but these paying methods are limited to the low numbers of ATMs due to the restrictions of importing these machines due to the sanctions exerted on the Syrian government relating to the current armed conflict within Syrian territory. those sanctions extend to import parts necessary for maintenance. Besides, the other public and private banks are not engaged in this process due to technical issues relating to upgrading and integration of systems.

Furthermore, due to conflict circumstances and their consequences, there is information listed on the Syrian e Gov Web Portal is not updated in content and the required fees, besides inaccurate estimated time to accomplish some services as it maybe has been calculated before the start of the current conflict, Also, there are some titles have no content such as FAQ which is not listed in Arabic interface at all, moreover, the English interface is still under development and it is lagging as it contains many links and information in Arabic, or it is just a title (link) without any content.

6. METHODOLOGY OF THE RESEARCH

This research splits into two parts, preliminary (exploratory), and empirical research, which will be discussed thoroughly in the following paragraphs.

6.1 Preliminary (Or Exploratory) research

The first part of this study defines factors affecting e- government implementation by conducting exploratory research depending on revising secondary data concerning factors affecting e- government worldwide covering different countries and regions belonging to diverse cultural and economic groups, then refining these factors in the Five Categories Classification Tool (FCCT) developed by this study to organize and to ease field research stage and other future studies relating e- government. In this part of the preliminary (exploratory) research of the study, the results will be classified into five tables each specialized in one of the FCCT disciplines, highlighting the reference studies used to determine each factor accompanied by summarized measures and description, those five tables form the base for the empirical study and the quantitative research.

The next part of the preliminary study is developing preliminary scales measuring Social and Technological groups of factors affecting e- government context following FCCT classification, abstracted from previous studies concerned with assessing those factors in cases of e- government, e- projects, and interacting online.

By the end of this stage, the research will have two preliminary scales for measuring e- government Social and Technological affecting factors.

6.2 Empirical research

The ultimate target of the empirical is developing general scales designed specially to evaluate Social and Technological factors affecting e- government implementation, then elaborating Social scales to suit the Syrian case study as an example of developing countries and countries suffering from armed conflicts, and finally, determining empirically which of Social factors have an influence on Syrian e- government.

This empirical study is divided into qualitative research and quantitative research.

6.2.1 Qualitative research

The next stage following preliminary research is developing general scales to measure Social and Technological factors affecting e- government, those scales offer a ready tool for future research to assess Social and Technological groups of factors affecting implementing e- government regarding a specific case study, as this research will do in the next stage by using the scales of the Social category (Table 8) in the pilot survey to reach new Social scales designed especially to suit Syrian case study, those new scales form additional addition as a ready-use tool evaluating Social factors affecting e- governments in developing countries and countries suffering from wars and conflicts.

After developing the above-mentioned preliminary scales, this research will perform in-depth interviews by presenting the preliminary scales of social and Technological factors affecting e- government implementation worldwide gathered by FCCT to experts in this regard.

In-depth interviews are planned to discuss the Social and Technological preliminary scales in light of constructs' sufficiency, phrasing, reliability, and validity, and propose suggestions. depending on that the research will perform the needed amendments.

Then, the research will initiate two focus groups for open discussions about the scales measuring Social factors affecting Syrian e- government implementation these groups consist of different groups of people covering different ages, education levels, disciplines, official and non-official employees (even former employees), cultural backgrounds, regions, and cities and governorates, another two focus groups will be initiated for Technological factors' scales consisting of people with a technological background of IT Systems.

After in-depth interviews with experts, and making amendments the resulting scales will be revealed to the two initiated focus groups in sequence, the first group identifies items/ questions that have the same meaning in perceptions and thus the same answer within each scale, then the second focus group identifies similarity across scales within each Social and Technological categories, then the research eliminates the repetition and makes amendments suggested by the two focus groups in sequence.

By the end of this stage, the researcher sends the amended scales to experts in e- government to validate the scales for use in pilot surveys.

Because of time and budget limitations, at this point, the research will continue further fieldwork (pilot and final surveys) only with Social factors and settles for the reached Technological general scales, proposing conducting fieldwork of Technological factors in future works.

Qualitative research ends by performing a pilot survey of Social factors to reduce the number of items in the scales, and thus reduce the number of questions in the questionnaire by using factor analysis the with varimax rotation method.

At this point of the study, the research decided to assign an independent survey for Digital Divide, as Digital Divide requires a survey alike the surveys allocated for measuring e- government indices which need statistics, censuses, and big quantitative data exceed the possibilities of individual research in cost and time frame, but the possibilities of governments or international organizations such as UN, OECD, Eurostat (United Nations, 2014b), hence, the research will use the accepted method used on assessing EG7 (E government level 7)⁵ by United Nations Manual for measuring e-Government by directing questionnaire to national experts (United Nations, 2014b, p. 39). So, the Digital Divide questionnaire developed by this study will be addressed to insiders and national experts in the Syrian e- government issue and familiar with statistics, in this case, the survey dedicated to assessing the digital divide will be conducted directly after validation of the scale by experts as without going through a pilot survey.

⁵“EG7: Selected Internet-based services available to citizens, by level of sophistication of service, The Internet-based services for which information is sought are:

Enroll to vote for the first time in government elections., Complete and lodge personal income tax return, least complex situation., Obtain unemployment income benefits, least complex situation., Obtain child support allowance, least complex situation., Renew an international passport, least complex situation., Renew a driver's license, least complex situation., Make an official declaration of theft of personal goods (excluding motor vehicle and burglary) to the relevant police., Obtain a copy of a birth certificate for self., Obtain a copy of a marriage certificate for self., Renew registration for a motor vehicle least complex situation” (United Nations, 2014b, p. 25)

As a result, the pilot survey for assessing Social factors that will be distributed contains all social factors scales except the Digital Divide to be distributed to a sample of the population (Citizens).

Considering the pilot survey results, the research builds up final questionnaires to evaluate Social factors affecting e- government implementation in Syria, validate them, then distribute them in the Quantitative research described in the following paragraph.

6.2.2 Quantitative research

Only the Social group of factors will be examined by this research in the quantitative part of the study due to time and budget limitations for an independent PhD dissertation to perform a field study covers all five groups of factors affecting e- government implementation, besides the hinders facing collaboration from politicians and formal employees necessary to conduct Political, Technological, Organizational, and financial surveys in the Syrian current conflict context, in addition to the priority of studying the Social field as the change process and weaknesses corrections in the social context take a long time to be performed (Harrikari and Rauhala, 2014).

The quantitative research begins with the results of the pilot survey to build the final questionnaires to evaluate Social factors affecting e- government implementation in Syria, validate them, and distribute them.

This research to collect data depends on surveys designed on a Single cross-sectional samples basis and judgmental sampling to represent the studied society regarding demographic distribution over governorates and gender in the Syrian Arab Republic.

Also, the research allocates an independent questionnaire to assess the Digital Divide existence and extent in the Syrian case study -that justified in the previous paragraph 6.2.1- and will distribute this individual questionnaire to the experts and insiders in e-government.

Eventually, the surveys get rich data containing the opinions a of wide range of Syrian beneficiaries covering different ages, education levels, businesses, private and government employees, disciplines, cultural backgrounds, regions, cities, and governorates.

The quantitative research will collect data using questionnaires based on the five-scale Likert measure as it is easy to understand and answer by the respondents.

7. SYRIAN BACKGROUND

7.1 Demographics

Syrian population estimated by The World Bank in 2021 reaches 21,324,367, splits into 50% females, and 50% males (World Bank Website, 2021b).

Unfortunately, The World Bank and United Nations don't provide information about population distributions over Syrian governorates. The latest available information in this regard is from the Syrian Central Bureau of Statistics which gives the population distributions over Syrian governorates in the year 2016 shown in Figure 5. This differentiation in the time of collecting data among the mentioned references wouldn't affect the results of this research since the study will use only the percentage of people distribution over governorates in planning the sample distribution to represent society as much as possible, see Table 6. Any tolerance in this percentage of distribution does not affect the results as the study didn't involve any statistical analysis concerning demographic distribution over governorates.

Table 6. Estimate of the population in Syria by governorates 2016 (in thousands).

Governorate	Estimated population (thousands)	Percent
Damascus	2011	9.443088
Rural Damascus	2957	13.88524
Aleppo	3734	17.53381
Homs	1573	7.386364
Hama	1976	9.278738
Latakia	1453	6.822878
Idleb	1445	6.785312
AL-Hasakeh	1621	7.611758
Der-es-Zor	1124	5.277986
Tartous	1114	5.231029
AL- Rakka	853	4.005447
Daraa	845	3.967881
AL- Sweida	509	2.39012
AL- Quneitra	81	0.380353
Σ	21296	100

Source: Author's own development (2022). depending on data from the Central Bureau of Statistics. (2017). Indicators estimate of the population in Syria by governorates 2016. *Population and Demographic, Yearbook, Chapter 2*. <http://cbssyr.sy/yearbook/2017/Data-Chapter2/TAB-4-2-2017.pdf>.

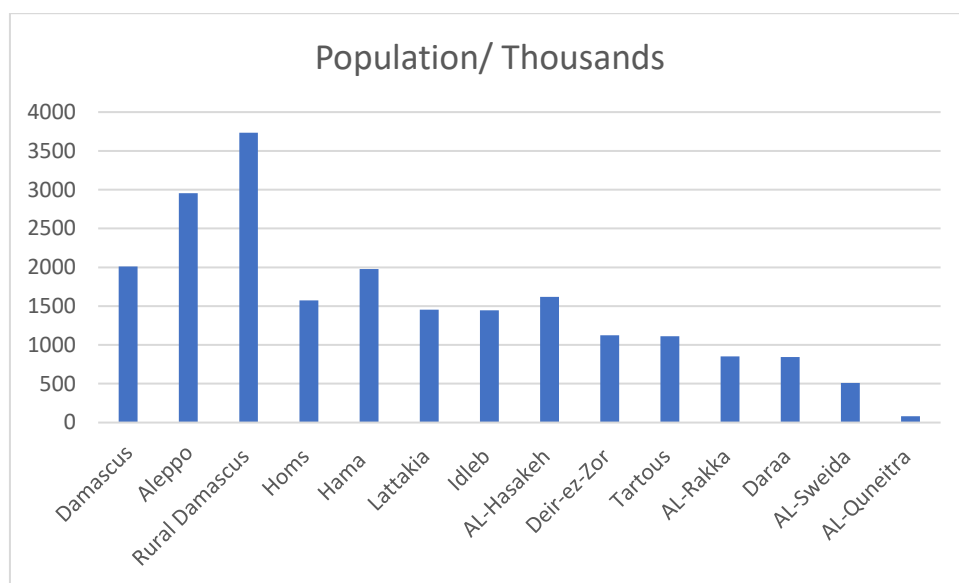


Figure 5. Syrian population distribution over governorates in thousands 2016.

Source: Author's own development (2022), depending on data from the Central Bureau of Statistics. (2017). Indicators estimate of the population in Syria by governorates 2016. *Population and Demographic, Yearbook, Chapter 2*. <http://cbssyr.sy/yearbook/2017/Data-Chapter2/TAB-4-2-2017.pdf>.

7.2 Gender and age distribution in Syria

Syrian population on Syrian territory have been decreased from 21.4 million inhabitants in 2010 to 16.9 million in 2018 (UNDP Human Development Reports, 2019b), this degradation in population is caused the by Syrian conflict consequences, 50.5 % of the population are females, 49.5% are males., (World Bank website, 2021).

Syrian population under 14 years old in 2018 made up 31% of the population, 64% between 15- 64 years, and 5% above 65 years old (World Bank website, 2021a), also, they split according to the CIA World Factbook (2020) to:

15-24 years: 19.34% (male 1,872,903/ female 1,879,564).

25-54 years: 37.31% (male 3,558,241/ female 3,679,596).

55-64 years: 5.41% (male 516,209/ female 534,189).

65 years and over: 4.46% (male 404,813/female 459,417) (2020 est.), illustrated in Figure 5.

Simple calculations of the above numbers show that the Syrian population between 15-64 years old equals 12,904,932: (6,352,166 male, 6,552,766 female)/ (49.2% male, 50.8% female).

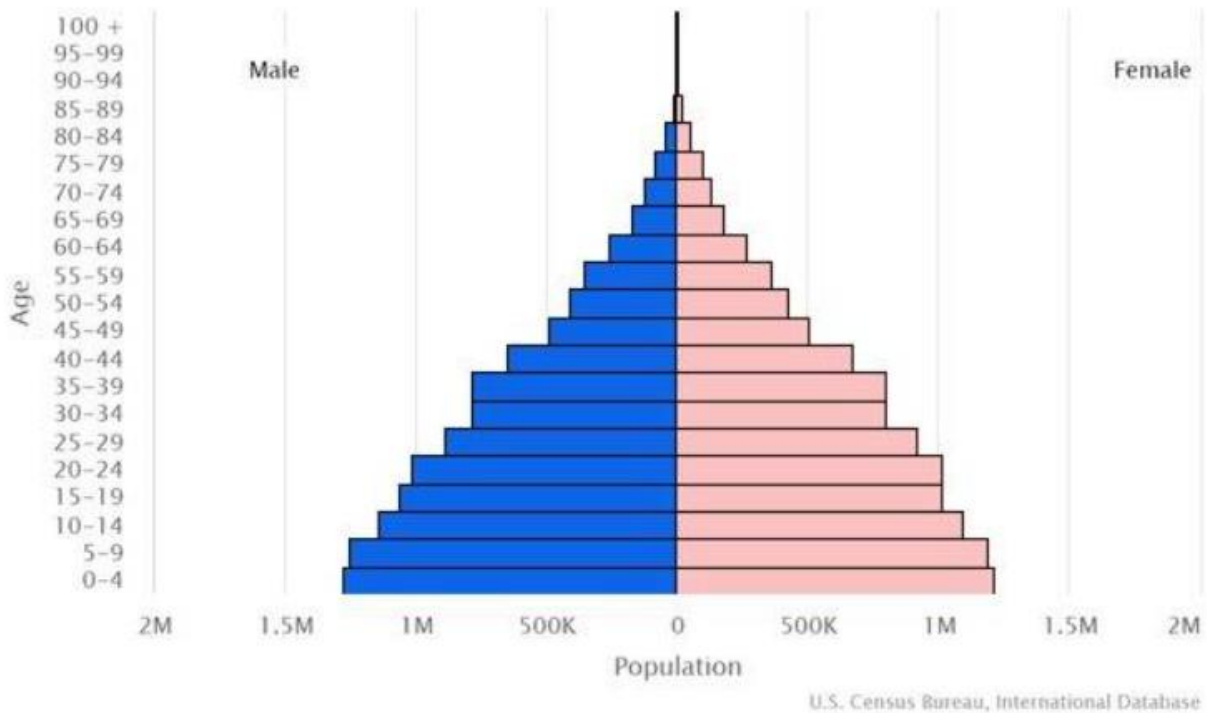


Figure 6. Syrian population distribution pyramid 2020.

Source: CIA World Factbook, <https://www.cia.gov/the-world-factbook/countries/syria>.

7.3 The education and gender distribution in Syria

Syria before the current armed conflict had a high rate of literacy in both genders, also, it had a high percentage of students enrolled in the Second stage of tertiary education (ISCED 6) for both genders, and this trend toward education among Syrians continued during the years of current conflict whenever it was possible as deeply illustrated by Trading Economics (2020) which depended on World Bank data 2020, Table 7.

Table 7. Syrian education and literacy levels ratios.

Literacy rate, youth female (% of females ages 15-24): 90.22 %
Literacy rate, youth male (% of males ages 15-24): 94.61 %
Percentage of all students in tertiary education enrolled in ISCED 5, both sexes: 3.89 %
Percentage of female students in tertiary education enrolled in ISCED 5: 3.39 %
Percentage of male students in tertiary education enrolled in ISCED 5: 4.43 %
Percentage of all students in tertiary education enrolled in ISCED 6, both sexes (%): 92.62 %
Percentage of female students in tertiary education enrolled in ISCED 6: 93.51 %
Percentage of male students in tertiary education enrolled in ISCED 6: 91.67 %
Percentage of all students in tertiary education enrolled in ISCED 7, both sexes (%): 3.26 %
Percentage of female students in tertiary education enrolled in ISCED 7: 2.92 %
Percentage of male students in tertiary education enrolled in ISCED 7: 3.63 %

Percentage of all students in tertiary education enrolled in ISCED 8, both sexes: 0.2271 %

Percentage of female students in tertiary education enrolled in ISCED 8: 0.1892 %

Percentage of male students in tertiary education enrolled in ISCED 8: 0.2679 %⁶

Source: Trading Economics website. (2020)^{7,8}<https://tradingeconomics.com/syria/government-expenditure-on-primary-education-as-percent-of-gdp-percent-wb-data.html>.

⁶ <https://tradingeconomics.com/syria/government-expenditure-on-primary-education-as-percent-of-gdp-percent-wb-data.html>

⁷ Syrian students' percentages in tertiary education enrolled in ISCED 5, ISCED6, ISCED7 and ISCED8 shown in the table are in the year 2016, sourced from Trading Economics according to the World Bank collection of development indicators, compiled from officially recognized sources.

⁸ Syria - Literacy rate, youth total (% of people ages 15-24) - actual values, historical data, forecasts and projections were sourced from the World Bank on April of 2020, by Trading Economics.

8. PRELIMINARY (OR EXPLORATORY) RESEARCH

8.1 FCCT Model, Summary of preliminary (exploratory) research

The FCCT Model and its corresponding tables have already been achieved in paragraph 3.6. Here, this paragraph provides a summary of the FCCT development in the following lines.

Depending on discussions in paragraph 3.6 concerning factors affecting e- government implementation that grouped following the Five Categories Calcifications Model FCC presented by Alassaf et al. (2020), this research developed an enhanced tool; the FCCT model (Five Category Classification Tool) Figure 4., accompanied by five correlating tables, Tables 1. 2. 3. 4. 5., each contains comprehensive factors affecting e- government implementation in a specific discipline (Political, Social, Technological, Organizational and Financial groups), forming in total a comprehensive and inclusive tool contains all factors discussed in the literature concerning e- government implementation classified in five broad disciplines dominating e-government research.

Hence, FCCT is a ready tool for researchers and e- government projects managements to find out specific framed factors affecting e- government in each discipline of concern. the research of this study will depend on FCCT as a starting point now and after.

8.2 Developing preliminary measurement scales

This paragraph is devoted to developing preliminary scales measuring Adoption and Social and Technological factors affecting e- government. by understanding the scales used in previous studies in the literature illustrated by FCCT.

Developing preliminary scales is explained extensively in this Paragraph step by step, keeping in mind the need to develop an Adoption scale that will be used in the quantitative research to assess the influence of social factors as will be explained later in paragraph 10.2.16.

8.2.1 Developing preliminary scales of Social factors affecting e- government

This research to measure social factors affecting Syrian e- government implementation depends on the social factors presented by the Five Categories Classification Tool FCCT. Each of these factors is measured by a set of items developed by this study from the scales used in previous studies as explained in the following subparagraphs.

8.2.1.1 Measuring Perceived Awareness of e- government

The research has reached a 4-item preliminary scale to measure perceived awareness of e- government by revising items mentioned in Shareef et al., (2018, 2011) studies that concern measuring user's perceived awareness of e- services. Those items are:

- 1- You are aware of e- government services in your country.
- 2- You are aware of the benefits of using e- government services.
- 3- You have trained to know about all the capacities of e- government service.
- 4- You have heard or known about a campaign or an advertisement concerning Syrian e- government services.

8.2.1.2 Measuring Intention (Willingness) to use e- government services.

This research adapted a five-item scale developed by Alassaf and Szalay (2022) that measures users' intention to keep using e-services. This scale reported Cronbach's alpha reliability test of 0.82 and was built depending on items adapted basically from the scales used by Alassaf and Szalay (2020), Esterhuysen et al. (2016), Pavlou (2003), and Gefen and Straub (2000), and by revision of Chatzoglou et al. (2009) model.

The following five items form the preliminary scale that assesses intention used in this stage of research:

- 1- You will keep using e- government services websites to retrieve information.
- 2- You will keep using your credit card to pay for services via e- government websites.
- 3- You will not be hesitating to provide information online via e- government websites.
- 4- There is a high probability that you will keep performing your needed services which are available via e-government websites.
- 5- You will keep using e- government websites to inquire what other users think of a product or service (users' feedback).

8.2.1.3 Measuring Perceived Quality of e- government services

The 46-item preliminary scale used in this research that developed and adapted to assess user's Perceived Quality of e- government services fell into two groups explained in the following lines:

- **First group measuring e- government service quality**

The 46-item preliminary scale used in this research developed and adapted to assess user's Perceived Quality of e- government services fell into two groups explained in the following lines:

- **First group measuring e- government service quality**

This research to measure e- government service quality -as a factor affecting social adoption of e- government- developed an e- government service quality scale from Parasuraman et al. (2005) scale assigned for assessing e- service quality E-S-QUAL. The latter consists of 22 items spread over four dimensions; Efficiency: The ease and speed of accessing and using the site, Fulfillment: The extent to which the site's promises about order delivery and item availability are fulfilled, System availability: The correct technical functioning of the site, Privacy: The degree to which the site is safe and protects customer information.

Also, this added some related items to suit the case of e- government (Items: 21,22 and 23) reaching twenty-five items developed items described as follows:

- **Efficiency**

- 1- E government services websites make it easy to find what you are looking for.
- 2- Those websites have a clear design that you can easily move anywhere on the site.
- 3- You can accomplish your transactions quickly through those websites.
- 4- those websites have well organized information.
- 5- loading pages of those websites is fast.
- 6- websites are simple to use.
- 7- You can reach/ find those websites quickly.

8- This site is well organized.

- System Availability

- 9- E government services websites are available at all times.
- 10- You can launch and run e- government services websites right away.
- 11- Those websites don't crash.
- 12- Those websites don't freeze.

- Privacy

- 13- E government protects personal information when used through its websites.
- 14- E government doesn't share your personal information with other government entities but is just concerned with the requested service.
- 15- The information concerning your online payment methods is protected through e- government websites (such as credit card or bank account information).

- Fulfillment

- 16- You receive your request on schedule.
- 17- E government services sites make products available for delivery within a suitable time frame.
- 18- You can get your requested services quickly after their availability.
- 19- It sends out the items ordered.
- 20- The physical goods offered by e- government platforms are always available in stock (that means the goods can be received immediately after your request became available on the e-government website).
- 21- The requested services such as official papers are electronically authenticated.
- 22- Your requests through e- government can be delivered to your resident address.
- 23- When delivery of certain services is available, e-government delivers the products quickly.
- 24- E government gives accurate promises about the delivery of products.
- 25- Offered services by e- government are truthful.

• Second group measuring e- government service quality

The study by revising as many studies that demonstrate, present, and discuss measurement scales of e- services quality -such as Loiacono et al. (2007), Accenture (2003), AGIMO (2003), Chen and Thurmaier (2005), Tung and Rieck (2005), Wangpipatwong et al. (2005), Collier and Bienstock (2006), Fassnacht and Koese (2006)- concluded that the researchers concerned with evaluating e- services quality depend on SERVQUAL in some cases and in other cases they don't.

Depending on this, in order to cover all scales/items assessing e- service quality, the research adapted the items assessing service quality that are consistent with e- government case, then eliminated the similar items to those already mentioned in the first group measures e- government service quality. The abstracted items may fall fully or partially in the four dimensions of the E- S- qual scale mentioned previously in the first group. But this research preferred to present those items separately, as classifying them in mentioned dimensions is not a concern at this point of the study (it will be done later in paragraph 9.1.1).

The ultimate number of the second group reaches 21 items as follows:

- 26- e- government services' platforms are equipped with recent up to date information.

- 27- The information provided by e- government services is precise.
- 28- You can understand e- government services instructions and information easily.
- 29- E government services contain the necessary information to fulfill your inquiries.
- 30- The information and instructions provided by e- government services websites are well organized and lead you to accomplish the needed task step by step.
- 31- E government services websites contain the necessary related information about the formal regulations and laws concerning each service.
- 32- E government websites contain links to further useful information.
- 33- Each e- government service contains links to other related services websites.

Also, Murru (2003) in his study discussed further aspects of measuring e- services quality than discussed above, this research has adapted and developed items that serve e- government service quality measurement.

- 35- Each e- government service contains sufficient help texts that illustrate all processes and frequently asked questions.
- 36- E government services are available everywhere by using mobile phones, computers...
- 37- Using e- government services is an easier way to perform needed tasks other than the conventional way.
- 38- E government services provide all necessary processes to accomplish the whole task from A- Z (including online payment, document authentication, etc.).
- 39- There are sufficient e- government services in governmental offices (official e- government services offices).
- 40- E government services make it easier to perform tasks and there is no need to do some parts conventionally.
- 41- The platforms of e- government services are available in other languages besides the official language those are spoken by some minorities
- 42- If your mother language is not available on e- government platforms, you cannot use those platforms without help.
- 43- The Platforms of e- government services are available in foreign languages Such as English, French, etc.

There is another set of items that measure e- services quality discussed by many studies from the perspective of user's perceived functional benefits which align with e- service quality; Yoo and Donthu (2015), Devaraj et al. (2002), Janda et al. (2002), Wang (2002), Wolfenbarger and Gilly (2003), Carter and Belanger (2005), Chen and Thurmaier (2005), Tung and Rieck, 2005; Wangpipatwong et al. (2005), Collier and Bienstock (2006), Fassnacht and Koese (2006), Kumar et al. (2007), in this regards this research take the benefit of those items in building e- government services quality scale by thoroughly comparing and abstracting the items that differentiate and aren't similar to previous items mentioned above in this paragraph.

- 44- Using e- government services is convenient anywhere.
- 45- It is more convenient to access e- government services at any time (e government services have 24/7 availability).
- 46- E government services give more options and functions than conventional government paths.

8.2.1.4 Measuring Attitude

This research aligns with Alassaf and Szalay (2022) discussions about building a scale measuring the Attitude to use E-Services depending on Alomari et al. (2010) scale to measure citizens' attitudes toward e- government, after excluding the item related to religious belief toward dealing with e- government (immorality), Alassaf and Szalay (2022)'s six-items scale reported 0.85 by Cronbach's alpha reliability test.

- 1- You find interacting via an e- government platform an appealing concept.
- 2- You find it a good idea to use e- government to fulfill your needs.
- 3- You like the idea of being one of the people who perform their needs using online channels.
- 4- You can catch up with any modifications that may occur on e-services websites
- 5- You have negative impressions about e- transactions and prefer traditional channels (reversed coding).
- 6- Your attitude toward e- services is negative because e- services will replace traditional work, and many employees will become jobless (reversed coding).

8.2.1.5 Measuring Perceived Trust

This research adopted a 12-item preliminary scale to measure perceived trust in e- government from previous studies; from Shareef et al, (2018, 2011) five items, three items from D'Alessandro et al., (2012), and four items from Alomari et al. (2009) as follows:

- The items adapted from Shareef et al, (2018, 2011):
 - 1- You believe that you can rely on e- government services to accomplish the available tasks (reliability).
 - 2- When you accomplish a task via an e- government service, you are sure that the task is definitely performed (E government provides guaranteed services).
 - 3- You feel that performing tasks via e- government services are more reliable than physical governmental paths.
 - 4- E government takes full responsibility for any insecurity in performing transactions via its services.
 - 5- E government services platforms/ apps have sufficient legal and technological policies for online protection.
- The items adapted from D'Alessandro et al., (2012):
 - 6- You feel confident to pay online by available means through e- government services.
 - 7- You don't need to worry about paying online by the available means through e- government services.
 - 8- Until now, by your experience of using e- government services you can tell that they are reliable services.
- Alomari et al. (2009) suggested splitting trust in e- government into two scales first scale measures trust in the internet relating to security and privacy issues, the items of this scale are embedded in the above- mentioned items of Shareef et al, (2018, 2011), D'Alessandro et al., (2012), the second scale measures citizens' trust in government itself, this research adapted these items to use in building trust in e- government scale.

- 9- You can trust the government to carry out online transactions faithfully.
- 10- You believe that government keeps your best interests in mind.
- 11- You are sure that government will process the forms you submit through its websites.
- 12- You are sure government provides reliable up to date information via its websites.

8.2.1.6 Measuring Perceived Risk

The 2-item preliminary scale used in this study to measure perceived risk is adapted from Miyazaki and Fernandez (2001) measure to assess the general risk of e shopping which reported the coefficient $\alpha = 0.92$. D'Alessandro et al., (2012) reused this scale; reported coefficient $\alpha = 0.82$

- 1- You feel that using online e- government services nowadays become less risky.
- 2- E government services are a safe way to perform financial transactions.

8.2.1.7 Measuring Perceived Security

In order to measure perceived security, this study developed a preliminary four-item scale from Shareef et al. (2018, 2011) and D'Alessandro (2012) scales as follows:

- This research adapted and evolved the items that measure the Perceived Security of e- government used by Shareef et al. (2011) study about e- government Adoption Model (GAM), which was reused by Shareef et al. (2018) to measure the perceived security of mobile banking services.
 - 1- E government services are a safe way to perform financial transactions.
 - 2- E government services have sufficient security features.
 - 3- E government services platforms protect the information of your credit card (ATM card), username, and password.
- Another item used by D'Alessandro (2012) to assess perceived e security from fraud “using a well-known credit card for payment”, the research adapted this item to fit the study content.
 - 4- Using the credit cards or payment methods accepted by e- government services protects you from fraud.

8.2.1.8 Measuring Perceived Privacy

The following lines explain the 6-item preliminary scale this study reached to assess Perceived Privacy:

- As Perceived Privacy on one of its sides is a dimension of e- service quality discussed earlier in this paragraph, this research reused items that assess the privacy dimension to evaluate the quality of e- service from the E-S-QUAL scale developed by Parasuraman et al. (2005):
 - 1- E government doesn't share your personal information with other government entities. But it is just concerned with the requested service.
 - 2- The information concerning your online payment methods is protected through e- government websites (such as credit card or bank account information).
- This research found it is important to add the items of the three items-scale assessing perceived privacy of e- government from Shareef et al. (2011) study, those items are different from and are not

covered by those items concern in privacy form service quality point of view mentioned previously in this paragraph.

- 3- When you use e- government services, you do not hesitate to enter your personal information.
- 4- Your personal information is protected from disclosure when you use e- government services.
- 5- E government doesn't share your saved personal information with a third party.

- Also, from the four-item online privacy scale of D'Alessandro (2012), this research found only one item not included in e privacy items scales presented previously in this paragraph.

6- The privacy policy on e- government services pages is stated distinctly.

8.2.1.9 Measuring Satisfaction of e-government.

This stage of research developed a 22-item preliminary scale for Satisfaction with e- governments as follows:

- At first, this stage of study depends primarily on Alassaf and Szalay (2020) scale measuring learners' satisfaction with e learning during compulsory shifting toward e learning during the COVID 19 pandemic lockdown as an example of e- government services, Cronbach's Alpha for mentioned Satisfaction scale reported 0.94, Alassaf and Szalay's scale was developed from Esterhuyse et al. (2016), Gunawardena and Zittle (1997) and Morton (1993).

- 1- You were able to navigate through the medium of e- government websites.
- 2- You were stimulated to do additional tasks or have services that were mentioned or discussed on the e- government websites.
- 3- As a result of your experience with e- government services, you would like to participate in future online services.
- 4- Engaging with online e- government services was a useful experience.
- 5- The diversity of choices of e- government services enhanced your perception of the exact service outcome that you want.
- 6- You put great effort into learning the e- government system to participate in online services.
- 7- Generally, you have had positive experiences with e- government services.
- 8- You are satisfied with your experiences with e- government services.
- 9- You are satisfied with the support you have received from e- government services.
- 10- You are satisfied with the feedback you have received about your inquiries about e- government services.
- 11- You achieved your goals of using e- government services.
- 12- Using e- government websites helped you to improve the outcome of your wanted services.
- 13- You were satisfied with using e- government services to fulfill your needs.
- 14- You would use e- government services on a regular basis.
- 15- You would recommend using e- government services to others.

By adapting mentioned Alassaf and Szalay (2020) scale to suit e- services in general and in particularly e- government case, this study developed part of users' satisfaction with e- government scale.

- Since Alassaf and Szalay (2020) scale is designed to evaluate satisfaction with e learning, this research added other items to evaluate e satisfaction from the previous studies Guo et al (2012), Yao and Liao

(2011), and Lee and Lin (2005) in order to elaborate more comprehensive scale that recruits wider e satisfaction aspects covered in the literature.

16- Your decision to use e- government services was wise.

17- You are satisfied with using e- government services.

18- You enjoy when you use e- government to have your services.

19- You are satisfied with the services provided by the e- government portal.

20- You have overall satisfaction with e- government services.

21- E government services meet your expectation.

22- Generally, you have satisfaction with the online transactions provided by the e- government.

8.2.1.10 Measuring Perceived Uncertainty

From a social point of view, the uncertainty in the user's use of a virtual environment has a vital impact on using e- services/ e- government, Shareef et al., (2018, 2011) have elaborated a scale to measure Uncertainty in using e banking /e government consisting of three items, research -in this stage of study- will depend on it to assess user's uncertainty in dealing with e- government platforms.

- 1- The absence of personal contact in e- government services makes it hard to manage the task process.
- 2- You don't feel the comfort of interacting in a virtual environment.
- 3- You consider that the absence of personal contact in e- government services produces uncertain results.

8.2.1.11 Measuring Perceived Compatibility (personal compatibility) of e-government systems

This research used four-items preliminary scale to measure the perceived compatibility of e- government systems from a user point of view (personal compatibility). This scale was adapted from the original scales used to assess the perceived compatibility of mobile banking (Shareef et al., 2018) and to assess the perceived compatibility of e- government (Shareef et al., 2011).

- 1- E government websites go well with your collecting information preferences.
- 2- Interacting via the virtual environment suits your lifestyle.
- 3- You prefer interacting via a virtual environment to the personal contact with an employee.
- 4- E government websites fulfill your needs.

8.2.1.12 Measuring Perceived Usefulness (Perceived Benefit)

This research designs an 8-item preliminary scale to assess e- government perceived usefulness as follows:

- In the beginning, the study adapted 6 items from Alomari et al. (2009) scale which developed from Carter and Belanger (2005) and Davis (1989) studies.
 - 1- Performing tasks via e- government websites more quickly than the conventional way.
 - 2- Using e- government services save time.
 - 3- Using e-government websites make it easier to accomplish tasks.
 - 4- Performing different transactions via e-government websites are more easily than the conventional way.
 - 5- You believe e-government websites provide you with valuable services.

- 6- In general, you believe that e-government websites are useful.
- Two more items were adapted from Shareef (2011) study concerning e- services benefits.
- 7- You believe that content available on e-government websites is not useful for you (reversed coded).
- 8- You believe that e-government websites boost your effectiveness in using available services.

8.2.1.13 Measuring ICT Knowledge

Four-item preliminary scale to measure ICT knowledge this research developed depending on Shareef et al. (2018), Shareef et al. (2011) studies concerned with mobile banking/ e- government portals.

- 1- You have enough ICT knowledge to use computer.
- 2- You have enough ICT knowledge to use online applications.
- 3- You have enough ICT knowledge to use e- government services.
- 4- You have the self-confidence to use e- government services properly.

8.2.1.14 Measuring literacy

Alomari et al. (2009) considered that the educational level of citizens besides computer skills affects using e- services, from this point, this research adds a one-item scale to assess the education level of the surveyed respondents, which will appear at the beginning of the questionnaire with background questions “Please choose your education: Primary, Elementary, Secondary, Short cycle tertiary, Bachelor’s or equivalent level; Second stage of tertiary, Master’s or equivalent level, Doctoral or equivalent level”.

8.2.1.15 Measuring Perceived ability to use ICT

Shareef et al. (2011) presented a six- item scale to measure the perceived ability to use e- government services whereas Shareef et al. (2018) decreased items of the scale to four in the mobile banking case, this research chose to use the six items as a preliminary scale due to similarity of the case study (e government) in addition to adding three other items (last three items) abstracted from a further reading of the literature that measures overall perceived ability to use ICT.

- 1- You can learn online interaction easily.
- 2- E government services platform are flexible enough to interact easily.
- 3- Navigating e- government websites is easy.
- 4- The e- government services platforms structure is clear and comprehensible.
- 5- Performing your tasks through e- government services is easy.
- 6- Downloading and uploading required files from/to e-government services platforms is easy.
- 7- You have the confidence to use ICT devices (computers, tablets, smartphones).
- 8- You feel you can manage to deal with ICT devices (computers, tablets, smartphones) to do tasks properly.
- 9- Generally, you don’t want any help to manage the dealing of ICT devices (computers, tablets, smartphones) to do the tasks properly.

8.2.1.16 Measuring Perceived Image of using e-government.

This factor has a one-item measurement scale, it assesses self-appreciating and self-consideration as a superior member of society, this study adapted this scale from Carter and Belanger (2005) study to fit e- government services' users from a personal point of view, and the study neglected the items that measure business opinion as an e- government user.

- 1- Using e-government services gives you a special feeling of niche or differentiation in society.

8.2.1.17 Measuring Citizens' Adoption of e- government

Several researchers concerning e-government and e-commerce have suggested “intention to use” and “user’s using behavior” as indicators of e-government/e-commerce adoption, for instance, Carter and Belanger (2005), Carter and Weerakkody (2008) used intention to use e-government as an indicator of e-government adoption also, Gefen and Straub (2000) used intention to purchase (use) and intention to inquiry to decide adoption, and Pavlou and Fygenson (2006), to distinguish e-commerce adoption depended on assessing behaviors by investigating searching/ downloading information and product purchase done by customers, in this regard, Shareef (2011) used six items to assess e-government adoption: two items assessing using of e-government (mailing, and downloading forms), two items assessing future intention to use e-government (mailing, and downloading forms), and two items assessing recommending to others to use e-government (mailing, and downloading forms).

This research adapted and summarized the items from up-mentioned studies to assess e- government adoption in three general use of e- government that express the intention to use e- government and the user behavior as indicators of adoption as suggested by these studies. Besides, this research added another item to express the free choice to use e- government in case there is no other choice to perform a service other than e- government, under this condition using an e- government service (behavior act) doesn't express adoption because it is not a free choice.

- 1- There is a high probability that you will keep performing your needed services which are available via e-government websites.
- 2- You do not hesitate to provide information online via e- government websites.
- 3- Even if you have other choices, you use e-government to fulfill your needs available via e- government services.
- 4- You recommend using e- government services to others.

8.2.1.18 Measuring Digital Divide

This study developed 17- item preliminary scale for assessing the digital divide as follows:

- Marchionini et al., (2003) classify digital applications of e- government into three groups: enabling citizen participation, access information ability, and services availability of digital transactions.

This research abstracted 10 items to assess the digital divide from user’s perspective by using Marchionini et al. (2003) study and other studies that assessed the influence of the digital gap on

implementing e-services/ e- government; Al-Shafi (2009), Rubaii-Barrett and Wise (2008), Madon et al., (2007) and Shin, (2007).

- 1- In general, citizens have enough knowledge to use ICT by themselves, and thus they can perform their needed tasks online.
 - 2- Government/ NGOs provide enough adequate ICT courses.
 - 3- The ICT courses provided by the government/ NGOs are accessible to all.
 - 4- Government/ NGOs provide ICT courses concerning business/citizen needs.
 - 5- There are curricula in ICT focused on users' needs.
 - 6- There is sufficient ICT infrastructure for ICT courses in public schools.
 - 7- There is sufficient ICT infrastructure for ICT courses in higher education.
 - 8- There is sufficient ICT infrastructure for ICT courses in secondary public schools.
 - 9- There is sufficient ICT infrastructure for ICT courses in primary public schools.
 - 10- There is a well known specific website that gives information about national ICT courses.
- Also, Murru (2003) presented the digital divide a from resources availability point of view and suggested assessing the digital divide by using a set of items, this research adapted them to fit the context of the study.
 - 11- You have sufficient personal computer/ smart phone to use e- government services.
 - 12- At your workplace, you have a sufficient computer to use e- government services.
 - 13- You have a private personal sufficient internet connection (adequate speed).
 - 14- At your workplace, you have a sufficient internet connection (adequate speed).
 - 15- You see that an adequate internet speed connection fee to use e-government services has a high cost (reversed coded).
 - 16- You have the means to do your transactions online (credit card, online paying methods...)
 - 17- Governmental offices provide sufficient places with sufficient infrastructure to participate in e-government services.

In the end, a deeper look at the items measuring social factors affecting e- government, some of them may have the same meaning in more than one scale, those repeated items will be revealed and eliminated in the next stage of the research.

8.2.2 Developing preliminary scales of Technological factors affecting e- government

8.2.2.1 Availability of Integrated System.

This research developed a five-items scale to measure the availability of integrating systems as follows:

- One item adapted from Baum and Maio (2000) and Al-Khoury and Bal (2007)
 - 1- In your opinion the integrated system produced less online functionalities
- Two items from Al-Shafi (2009) discussion concerns system compatibility
 - 2- In your opinion, different government agencies are using incompatible software that causes a malfunction in working together.
 - 3- In your opinion, different government agencies are using incompatible hardware that causes a malfunction in working together.
- Another item abstracted from Layne and Lee (2001), and Anthopoulos et al., (2007).

- 4- Users can access by one-stop points via a single integrated gate-way.
- The last item adapted from discussions of Yonazi et al. (2012) report supported by The World Bank and Keen (1992).
- 5- In your opinion, the used systems are standardized in a way that enables designers to evolve services independently in different ways and allows services to work with compatibility.

8.2.2.2 Availability of Adequate IT/ICT Infrastructure.

This research to assess available ICT infrastructure adapted three-item scale as follows:

- One item adapted from Al-Shboul et al. (2014), Nabafu and Maiga (2012), Sang et al. (2009), Bwalya (2009), and Rokhman (2011) discussions.
 - 1- From your experience, there is a lack of technological resources for providing stable e-government services such as computers, servers, adequate internet speed, etc.
- Two items abstracted from Basamh et al. (2014) ideas about implementing e- government.
 - 2- From a technological perspective, users, at anytime, can easily access e- government services.
 - 3- From a technological perspective, users can easily access e- government services from anywhere.

8.2.2.3 System Design

This research to evaluate e- government system design elaborated twelve-item scale from many previous studies as follows:

- The first item evolved from studies of Alomari et al. (2009), OECD (2003), Davis (1989), and Toots (2019).
 - 1- From a technical point of view, you see system design is easy and accessible to information (which makes performing tasks more productive, effective, and makes work easier and better).
- Four items developed from Panopoulou et al. (2010, 2014) discussion about e participation.
 - 2- In your opinion, system design is useable.
 - 3- In your opinion, system design is interactive.
 - 4- In your opinion, system design is adaptable to technological developments.
 - 5- The system design meets the special needs and circumstances of users (such as minorities and people with special needs).
- Kumar et al. (2007) ideas of successful e- government adoption urged this research to extract four items.
 - 6- From a technical point of view, you can see that the system design is controllable.
 - 7- From a technical point of view, you can see that the is understandable.
 - 8- From a technical point of view, you can see that the system design is easy for the user to become skillful.
 - 9- From a technical point of view, you can see that the system design is flexible.
- One item from Bwalya (2009)
 - 10- The system design is providing its content in English besides the local languages.
- Another item from Jansson (2013).

11- The system updates its practices continuously.

- At last, one item developed from Pardo et al. (2012), and Weerakkody and Dhillon (2008) studies.

12- You can say that the system design is interoperable.

In this regard, entities' systems are interoperable when they can communicate, connect, and exchange information between applications and databases seamlessly, regardless if those systems were designed by different manufacturers or not. (Vernadat, 2007).

8.2.2.4 Technical Support.

This research evolved a scale for assessing technical support of e-government from Abu-Shanab (2014), and Ahmad et al. (2013) discussions about the importance of technical support in e-government adoption.

1- In your opinion, there is enough Technical Support from the government website support.

8.2.2.5 Unrealistic Expectations.

The study adapted a one-item scale to evaluate the existence extent of unrealistic expectations from an e- government system abstracted from Toots (2019), and Sussha and Gronlund (2014).

1- In your opinion, some expectations of e-government systems are unrealistic.

The researcher added a question to gather the causes that prevent those expectations from being achieved (open question).

2- If you see an existence of unrealistic expectations from the e- government system, please describe briefly why those expectations are unrealistic.

8.2.2.6 Availability of Trusted and Secure medium.

Two-items scale this research developed to assess the availability of a trusted and secure medium used by e- government from a technical point of view.

The first item evolved from Al-Khourri and Bal (2007), and Conklin and White (2006).

1- From a technical point of view, the technical team of the e-government provides adequate solutions for security and privacy concerns.

The second item abstracted from Waidner and Kasper (2016) study.

2- From a technical point of view, data analytics in current e- government websites bring challenges to data privacy and protection.

8.2.2.7 Quality of Technology

This research developed an eight-item scale to measure the quality of technology used in e-government. Seven of these items are abstracted from Dabholkar (1996) study about user evaluation of the quality of new technology-based self-service options.

1- You can say that the speed of e- service delivery is good.

2- In your opinion, the e- government website/s design makes it easy to use e- services

3- In your opinion, the e- government website/s is/ are reliable to accomplish its services.

- 4- You can say that the e- government website/s design is an Enjoyment one
- 5- In your opinion, the e- government website interface is controllable.
- 6- In your opinion, the service quality matches the expectations.
- 7- Most of the time, the e- services need interaction with the service employee.

This study abstracted item number eight from a further reading of the literature.

- 8- In general, e- government websites don't crash or freeze.

9. EMPIRICAL RESEARCH

This stage of research is split into two field studies, qualitative and quantitative research describe the field work step by step to gather data and prepare them for analysis.

9.1 Qualitative research

The goal of the qualitative research is to elaborate scales to measure Social and Technological factors affecting e- government by developing scales used in the literature with the help of in-depth interviews with experts and initiating focus groups, followed by conducting a pilot survey to reach final reliable and valid social factor scales to be used in building the questionnaires of the quantitative research.

9.1.1 Preparing Social and Technological Factors Pilot Surveys

The aim of the pilot surveys designed by this study is to reduce the number of questions used in the final questionnaire and to propose ready general scales to assess Social and Technological factors affecting e- government for future research in any case study.

To avoid repeating and overlapping items within and between scales, preparing pilot surveys started with in-depth interviews by presenting the preliminary scales measuring affecting factors on e- government implementation developed by this research in paragraph 9.2 to experts in this regard. Those experts are concerned with the e- government context. The in-depth interviews discussed the scales' constructs sufficiency, phrasing, reliability, and validity, propose suggestions, then the research made the necessary amendments.

Research, to clear any suspicion if there some items have similarities in cognition while reading by the respondents, avoid and eliminate redundant items, has exposed all sets of items/ questions to two separate focus groups at two stages, as long as discussing a questionnaire by a focus group, according to Saunders et al. (2003), will enhance the questions, test respondents' understanding, and improve the clarity of ideas before performing the wide survey.

The first stage of focus groups discussions concerns identifying which items/ questions have the same meaning in perception and thus the same answer within each scale, especially since some proposed scales are composed of more than one original scale. The group decided which items/questions were considered the same in comprehension, then the research eliminated the repeated items/questions and exposed the resulting items to the next stage.

The second stage of focus groups discussions is identifying which items/ questions have the same meaning in the minds of second group members and thus the same answer among all scales (across scales) to avoid items overlapping between scales and repeating questions in the final survey. The group decided which items/questions were considered the same in comprehension then the research eliminated the repeated items/ questions with the help of the literature and experts concerning each of meant scales.

Finally, the remaining items/ questions, after enhancement and eliminating redundant items, were sent to experts in the e- government field to confirm their readiness to be used in the questionnaires.

By the end of this stage, this work presents ready general scales fit for evaluating social and Technological factors affecting e-government implementation and e-government Adoption. Those scales can be used directly with any case study or pilot survey.

Table 8, Table 9, and Table 10 illustrate in sequence the social factors scales, the Adoption scale, and the Technological factors scales.

Table 8. General scales for assessing Social factors affecting e- government.

Factor	Abbreviation	Scale/ Items	Notes
Perceived Awareness			3 items
	PA1	You are aware of e- government services in your country.	
	PA2	You are aware of the benefits of using e- government services.	
	PA3	You have trained to know about all the capacities of e- government service.	
Intention (Willingness) to use e- government services.			5 items
	Int1	You intend to use e- government to fulfill your needs available in e- government services.	
	Int2	You will keep using e- government services websites to retrieve information in the future.	
	Int3	You will keep using your credit card to pay for services via e- government websites.	
	Int4	You will not hesitate to provide information online via e- government websites.	
	Int5	There is a high probability that you will keep performing your needed services which are available via e- government websites.	
Perceived e- government services Quality			37 items
Website Efficiency			6 items
PESQ1	Efncy1	E government services websites make it easy to find what you are looking for.	
PESQ2	Efncy2	E government websites have a clear design that you can easily move anywhere on the site.	
PESQ3	Efncy3	You can accomplish your transaction quickly through those websites.	
PESQ4	Efncy4	Those websites have well organized content.	
PESQ5	Efncy5	E government websites are simple to use.	
PESQ6	Efncy6	You can reach/ find those websites quickly.	
System Availability			4 items
PESQ7	SA1	E government services websites are available at all times.	

Factor	Abbreviation	Scale/ Items	Notes
PESQ8	SA2	You can launch and run e- government services websites right away.	
PESQ9	SA3	Those websites don't crash.	
PESQ10	SA4	Those websites don't freeze.	
Privacy			<i>3 items</i>
PESQ11	Prvcy1	E government protects personal information when used through its websites.	
PESQ12	Prvcy2	E government doesn't share your personal information with other government entities. But it is just concerned with the requested service.	
PESQ13	Prvcy3	The information concerning your online payment methods is protected through e- government websites (such as credit card or bank account information).	
E government services fulfillment			<i>8 items</i>
PESQ14	Fulmn1	You receive your request on schedule.	
PESQ15	Fulmnt2	The timeframe needed to make your requested services available is suitable (e government services sites make products available for delivery within a suitable time frame).	
PESQ16	Fulmnt3	You can get your requested services quickly after their availability.	
PESQ17	Fulmnt4	The physical goods offered by e- government platforms are always available in stock and can be received immediately after your request became available on the e-government website.	
PESQ18	Fulmnt5	The requested services -such as official papers- are electronically authenticated.	
PESQ19	Fulmnt6	Your requests through e- government can be delivered to your resident address.	
PESQ20	Fulmnt7	E government gives accurate promises about the delivery of products.	
PESQ21	Fulmnt8	Offered services by e- government are truthful.	
E government Services Quality/ second group			<i>16 items</i>
PESQ22		E government services' platforms are equipped with recent up to date information.	
PESQ23		The information provided by e- government services is precise.	
PESQ24		E government services contain the necessary information to fulfill your inquiries.	

Factor	Abbreviation	Scale/ Items	Notes
PESQ25		The information and instruction provided by e-government services are well organized and lead you to accomplish the needed task step by step.	
PESQ26		E government services contain the necessary related information about the formal regulations and laws concerning each service.	
PESQ27		E government services contain links to further useful information.	
PESQ28		Each e- government service contains links to other related services websites.	
PESQ29		E government services are available everywhere by using mobile phones, computers...	
PESQ30		Using e-government services is an easier way to perform needed tasks other than the conventional way.	
PESQ31		E government services provide all necessary processes to accomplish the whole task from A- Z (including online payment, document authentication, etc.), so there is no need to do some parts conventionally.	
PESQ32		There are sufficient e- government services in governmental offices to meet your needs.	
PESQ33		The platforms of e- government services are available in local languages besides the official language.	
PESQ34		If your mother language (above mentioned local languages) is not available on e- government platforms, you cannot use those platforms without help.	
PESQ35		The platforms of e- government services are available in international languages such as English, French, etc.	
PESQ36		It is more convenient to access e- government services at any time (E government services have 24/7 availability).	
PESQ37		E government services give more options and functions than conventional government paths.	
Attitude toward using e-government services			6 items
	Att1	You find interacting via an e- government platform an appealing concept.	
	Att2	You find it a good idea to use e- government services to fulfill your needs.	
	Att3	You like the idea of being one of the people who perform their needs using online channels.	
	Att4	You can catch up with any modifications that may occur on e-services websites	

Factor	Abbreviation	Scale/ Items	Notes
	Att5	You have negative impressions about e- transactions and prefer traditional channels (reversed coding).	
	Att6	Your attitude toward e- services is negative because e- services will replace traditional work, and many employees will become jobless (reversed coding).	
Perceived Trust			9 items
	PT1	You believe that you can rely on e- government services to accomplish the available tasks (reliability).	
	PT2	When you accomplish a task via an e- government service, you are sure that the task is definitely performed (E government provides guaranteed services).	
	PT3	You feel that performing tasks via physical governmental paths are more reliable than e- government services (reversed coded).	
	PT4	E government takes full responsibility for any insecurity or fault in performing transactions via its services.	
	PT5	E government services platforms/ apps have sufficient legal and technological policies for online protection.	
	PT6	You feel confident to pay online by available means through e- government services.	
	PT7	You can trust the government to carry out online transactions faithfully.	
	PT8	You believe that government keeps your best interests in mind.	
	PT9	You are sure e- government provides reliable up to date information via its websites.	
Perceived Risk			2 items
	PR1	You feel that using online e- government services nowadays become less risky.	
	PR2	E government services are a safe way to perform financial transactions.	
Perceived Security			3 items
	PS1	E government services have sufficient security features.	
	PS2	E government services platforms protect the information of your credit card (ATM card) username and password.	
	PS3	Using the credit card or payment methods accepted by e- government services is a safe way to perform financial transactions and protects you from fraud.	
Perceived Privacy			5 items
	PP1	E government protects personal information from disclosure when used through its websites.	
	PP2	E government doesn't share your personal information with a third party.	

Factor	Abbreviation	Scale/ Items	Notes
	PP3	The information concerning your online payment methods is protected through e- government websites (such as credit card or bank account information).	
	PP4	When you use e- government services, you do not hesitate to enter your personal information.	
	PP5	The privacy policy on e- government services pages is stated distinctly.	
Satisfaction of e-government			20 items
	EgSAT1	You were able to navigate through the medium of e-government websites.	
	EgSAT2	You were stimulated to do additional tasks or have services that were mentioned or discussed on the e-government websites.	
	EgSAT3	As a result of your experience with e- government services, you would like to participate in future online services.	
	EgSAT4	Engaging with online e- government services was a useful experience.	
	EgSAT5	The diversity of choices of e- government services helped you to determine which is the exact service outcome you want.	
	EgSAT6	You put great effort into learning the e- government system to participate in online services.	
	EgSAT7	You are satisfied with your experiences with the e-government services (overall satisfaction).	
	EgSAT8	You are satisfied with the support you have received from e- government services.	
	EgSAT9	You are satisfied with the feedback you have received about your inquiries about e- government services.	
	EgSAT10	You achieved your goals of using e- government services.	
	EgSAT11	You would use e- government services on a regular base.	
	EgSAT12	You would recommend using e- government services to others.	
	EgSAT13	Your decision to use e- government services was wise.	
	EgSAT14	You are enjoyed when you use e- government to have your services	
	EgSAT18	You are satisfied with the services provided by the e-government portal.	
	EgSAT19	E government websites meet your expectation.	
	EgSAT20	Generally, you have satisfaction with the online transactions provided by e- government	

Factor	Abbreviation	Scale/ Items	Notes
Perceived uncertainty			3 items
	PUC1	The absence of personal contact in e- government services makes it hard to manage the task process.	
	PUC2	You don't feel the comfort to interact in the virtual environment.	
	PUC3	You consider that the absence of personal contact in e- government services produces uncertain results.	
Perceived Compatibility (personal compatibility) of e-government systems			4 items
	PC1	E government websites go well with your collecting information preferences.	
	PC2	Interacting via the virtual environment suits your lifestyle.	
	PC3	You prefer interacting via a virtual environment to personal contact with an employee.	
	PC4	E government websites fulfill your needs.	
Perceived Usefulness			8 items
	PU1	Using e- government services saves time.	
	PU2	Performing different transactions via e- government websites are more easily than the conventional way.	
	PU3	You believe e-government websites provide you with valuable services.	
	PU4	You believe content available on e-government websites is not useful for you (reversed coded).	
	PU5	You believe that e-government websites boost your effectiveness in using available services.	
	PU6	The cost of using e- government services (internet costs and updating devices costs) is higher than the conventional government cost (reversed coded).	
	PU7	Using E-government services to perform tasks enhances making decisions due to its wide options and functions and anytime availability.	
	PU8	In general, you believe that e-government services websites are useful.	
ICT Knowledge			4 items
	ICTK1	You have enough ICT knowledge to use a computer.	
	ICTK2	You have enough ICT knowledge to use online applications.	
	ICTK3	You have enough ICT knowledge to use e- government services.	
	ICTK4	You have the self-confidence to use e- government services properly.	

Factor	Abbreviation	Scale/ Items	Notes
Literacy		Please select your education level: Primary, elementary, secondary, short cycle tertiary, bachelor's or equivalent level; Second stage of tertiary, Master's or equivalent level, Doctoral or equivalent level.	1 item
Perceived ability to use ICT for interacting with e-government.			7 items
	PAict1	You can learn online interaction easily.	
	PAict2	E government services platforms are flexible enough to interact easily.	
	PAict3	The e- government services platforms structure is clear and comprehensible.	
	PAict4	Performing your tasks through e- government services is easy.	
	PAict5	Downloading and uploading required files from/to e-government services platforms is easy.	
	PAict6	You have the confidence to use ICT devices (computers, tablets, smartphones).	
	PAict7	Generally, you don't want any help to manage the dealing of ICT devices (computers, tablets, smartphones) to do the tasks properly.	
Perceived Image of using e-government			1 item
	PIMG	Using e-government services gives you a special feeling of niche or differentiation in society.	
		116 different items as PP1, PP2 repeated in two scales.	118 items
Digital Divide			13 items
	DD1	Generally, citizens have enough knowledge to use ICT by themselves, and thus they can perform their needed tasks online.	
	DD2	Government/ NGOs provide enough adequate ICT courses for users.	
	DD3	The ICT courses provided by the government/ NGOs are accessible to all.	
	DD4	There are curricula in ICT focused on users' needs.	
	DD5	There is sufficient ICT infrastructure for ICT courses in public schools.	
	DD6	There is a well known specific website that gives information about national ICT courses.	

Factor	Abbreviation	Scale/ Items	Notes
	DD7	Generally, citizens have sufficient resources to participate in e- government services (PC, Mobile, sufficient internet speed....)	
	DD8	Generally, workplaces have sufficient computers to use e- government services.	
	DD9	Generally, citizens have a sufficient private personal internet connection (adequate speed).	
	DD10	Generally, workplaces have a sufficient internet connection (adequate speed).	
	DD11	You see that an adequate internet speed connection fee to use e-government services has a high cost (reversed coded).	
	DD12	Generally, citizens have the means to do their transactions online (credit card, online payment methods...).	
	DD13	Governmental offices provide sufficient places with sufficient infrastructure to participate in e- government services.	
Total number of items		129 different items as PP1, PP1 repeated in two scales	131 items

Source: Author's own development (2022).

Table 9. e- government Adoption scale.

E government Adoption			4 Items
ADPT1	Int1	There is a high probability that you will keep performing your needed services which are available via e-government websites.	
ADPT2	Int2	You do not hesitate to provide information online via e-government websites.	
ADPT3		Even if you have other choices, you use e-government to fulfill your needs available via e- government services.	
ADPT4	EgSAT11	You recommend using e- government services to others.	

Source: Author's own development (2022).

Table 10. General scales for assessing Technological factors affecting e- government

Factor	Abbreviation	Items	Notes
Availability of Integrated System			5 items
	AIS1	In your opinion, the integrated system produced less online functionalities.	
	AIS2	In your opinion, different government agencies are using incompatible software that causes a malfunction in working together.	
	AIS3	In your opinion, different government agencies are using incompatible hardware that causes a malfunction in working together.	
	AIS4	Users access by one-stop points via a single integrated gate way.	
	AIS5	In your opinion, the used systems are standardized in a way that enables designers to evolve services independently in different ways and allows services to work with compatibility.	
Availability of Adequate IT/ICT Infrastructure			3 items
	AAI1	From your experience, there is a lack of technological resources for providing stable e- government services such as computers, servers, adequate internet speed, etc.	
	AAI2	From a technological perspective, users, at anytime, can easily access e- government services.	
	AAI3	From a technological perspective, users can easily access e- government services from anywhere.	
System Design			11 items
	SD1	From a technical point of view, you see system design is accessible to information, which makes performing tasks more productive, effective, and work easier and better).	
	SD2	In your opinion, the system design is useable.	
	SD3	In your opinion, the system design is Interactive.	
	SD4	In your opinion, the system design is adaptable to technological developments.	
	SD5	The system design meets the special needs and circumstances of users (such as minorities and people with special needs).	
	SD6	From a technical point of view, you can see that the system design is controllable.	
	SD7	From a technical point of view, you can see that the system design is understandable.	

Factor	Abbreviation	Items	Notes
	SD8	From a technical point of view, you can see that the system design is easy for the user to become skillful.	
	SD9	From a technical point of view, you can see that the system design is flexible.	
	SD10	The system updates its practices continuously.	
	SD11	You can say that the system design is interoperable. (Entities' systems are interoperable when they can communicate, connect, and exchange information between applications and databases seamlessly, regardless if those systems were designed by different manufacturers or not).	
Adequate Technical Support			1 item
	TS	In your opinion, there is enough Technical Support from the government website support.	
Unrealistic Expectations			1 item
	UE1	In your opinion, some expectations of the e-government systems are unrealistic.	
Open question			
If you see unrealistic expectations from e-government system, please describe briefly why those expectations are unrealistic.		P.S. This is an open question added by the researcher to collect the causes that prevent those expectations from being achieved, and it is not an item of measuring Unrealistic Expectations.	
Availability of Trusted Secure medium.			2 items
	SM1	From a technical point of view, the technical team of the e-government provides adequate solutions for security and privacy concerns.	
	SM2	From a technical point of view, data analytics in current e- government websites bring challenges to data privacy and protection.	
Quality of Technology			8 items
	QT1	You can say that the speed of e- government websites/ platforms is good (downloading pages, uploading information, responding time...).	
	QT2	In your opinion, the e- government website/s design makes it easy to use e- services	
	QT3	In your opinion, the e- government website/s is/ are reliable to accomplish its services.	
	QT4	You can say that the e- government website/s design is an Enjoyment one	
	QT5	In general, e- government websites don't crash or freeze.	
	QT6	In your opinion, from a technical point of view, the service quality matches the expectations.	

Factor	Abbreviation	Items	Notes
	QT7	Most of the time, the e- services need interaction with the service employee.	
	QT8	The e- government website/s is/are providing content in international languages as an option besides the local and official languages.	
Total number of items			31 items

Source: Author's own development (2022).

At this point, the research will conduct only pilot surveys of Social factors affecting Syrian e-government implementation and settles for Technological scales without a field test due to time and budget limitations for this independent PhD study. This potential is reserved for future studies.

9.1.2 Social Factors pilot survey /Syrian case study

Indeed, the stage of conducting the pilot survey is designed for Adoption and Social factors affecting the implementation of the e-government, with the exclusion of the Digital divide scale that has a separate questionnaire that will go directly to the quantitative stage without executing a pilot survey, that is because of the number of items/ questions resulted from the in-depth interviews and focus groups stage explained in paragraph 9.1.1 is not big, and the research accepts the validation of the scale performed by experts to the preliminary Digital Divide scale to reach the final Digital Divide 12-item scale.

The cause of allocating an independent questionnaire for the Digital Divide is that the intended social questionnaire sample for quantitative analysis targeting 1100 respondents is not enough to measure the Digital Divide, which is like the surveys allocated for measuring e- government indices need statistics, censuses, and big quantitative data exceed the possibilities of individual research in cost and time frame, but possibilities of governments or international organizations such as UN, OECD, Eurostat (United Nations, 2014b).

Table 11 contains the scales that measure social factors affecting e- government.

To increase the validity of the questionnaires, the questionnaire was translated from English to Arabic since it is the formal language of the targeted population of this study. Then the questionnaire was retranslated back into English by a different translator. The original English version of the questionnaires and the retranslated version were compared to ensure that they had the exact meaning.

The adoption and social factors pilot survey (without the digital divide) was distributed to 72 respondents.

The basis used by this research to select the respondents is they have a good knowledge of e-government and have used e-government services before. Respondents were essentially located in Latakia City and Damascus City. At the end of this pilot survey, an open question was added to take respondents' notes and remarks about the questionnaire's questions regarding perception, overlapping, and relevancy of questions to the Syrian situation.

Factor analysis with the varimax rotation method was conducted to reduce the number of items and reduce the number of questions in the questionnaire.

At first, items with cross loading of more than 0.4 were deleted depending on Straub (2004) recommendation for IS research.

Then, the research to reduce the number of items within each variable, items that have high loading were represented as a new factor with a new phrase expressing the common meaning of the component. Cronbach's alpha was used to test the internal coherence reliability of the new scales, depending on Nunnally (1978) criterion, the minimum Cronbach's alpha coefficient reported value of more than 0.7 is accepted to confirm internal coherence reliability. Depending on that, items that will be used in the final questionnaire to measure adoption and social factors affecting implementation (without the Digital Divide) of e- government, has reduced from 116 different items to 78 items.

Also, the factor analysis allowed the study to gather items within some scales into dimensions explained in Table 11, such as the expansion of the fulfillment dimension of the perceived service quality scale and adding a new dimension to this scale named system content, another example is splitting perceived privacy into two dimensions; Perceived Privacy of service quality and clarity of website privacy policy, also, perceived trust scale divided into two dimensions; trust in e- government services platforms and trust in government itself.

Finally, the final version of the questionnaires was sent to three researchers concerned with e- government for revision, and they approved it. Table 11 demonstrates the final list of Adoption and Social factors scales ready to use in the quantitative surveys.

The distributed questionnaire of Adoption and Social factor without the Digital Divide containing scales from Table 11, after reordering questions, and adding general information questions regarding governorate affiliation, age, gender, and education level, also, the two items used to assess privacy - as a dimension of the service quality scale- and at the same time to assess a dimension of perceived privacy, were mentioned one time in the questionnaire, the same for adoption scale. This questionnaire contains a total of 82 questions (78 essential questions illustrated in Table 11, and 4 questions for general information).

Whereas the distributed Digital Divide questionnaire (12 questions in total) contains only the digital divide scale, also defined in Table 11.

Table 11. Scales measure Social factors affecting e- government and Adoption in Syrian case study.

Factor	Abbreviation	Items	Notes
Perceived Awareness			3 Items
	PA1	You are aware of e- government services in your country.	
	PA2	You are aware of the benefits of using e-government services.	
	PA3	You have trained to know about all the capacities of e- government service.	
Intention (Willingness) to use e- government services.			3Items
	Int1	You intend to use e- government to fulfill your needs available in e- government services.	
	Int2	There is a high probability that you will keep performing your needed services which are available via e-government websites.	
	Int3	You will not hesitate to provide information online via e- government websites.	
Perceived e- government services Quality			23 Items
<i>Website Efficiency (Efncy)</i>			<i>6 items</i>
PESQ1	<i>Efncy1</i>	You can reach/ find those websites quickly.	
PESQ2	<i>Efncy2</i>	E government websites are simple to use.	
PESQ3	<i>Efncy3</i>	E government services websites make it easy to find what you are looking for.	
PESQ4	<i>Efncy4</i>	The content (information and instruction) provided by e- government services is well organized and leads you to accomplish the needed task step by step (including online payment, document authentication, etc.), so there is no need to do some parts conventionally.	
PESQ5	<i>Efncy5</i>	You can accomplish your tasks quickly through those websites.	
PESQ6	<i>Efncy6</i>	You can accomplish your tasks easily through those websites.	
<i>System Availability (SA)</i>			<i>3 items</i>
PESQ7	<i>SA1</i>	E government services websites are always available (e government services are available 24/7).	
PESQ8	<i>SA2</i>	Using ICTs made e- government services available everywhere, i.e., the system can work with many different devices and operating systems (mobile phones, computers, etc.).	

Factor	Abbreviation	Items	Notes
PESQ9	<i>SA3</i>	Those websites have good performance (no crashes or freezes, pages are not slow to load, etc.).	
<i>Privacy (PPsq)</i>			<i>2 items</i>
PESQ10	<i>PP1</i>	E government protects your information when used through its websites (Personal information, credit card, or bank account information).	
PESQ11	<i>PP2</i>	E government doesn't share your personal information with other government entities (or any third party). But it is just concerned with the requested service.	
<i>E government services fulfillment (Fulmnt)</i>			<i>10 items</i>
PESQ12	<i>Fulmnt1</i>	The timeframe needed to make your requested services available is suitable (e government services sites make products available for delivery within a suitable time frame).	
PESQ13	<i>Fulmnt2</i>	You can get your requested services quickly after their availability.	
PESQ14	<i>Fulmnt3</i>	The requested services -such as official papers- are electronically authenticated.	
PESQ15	<i>Fulmnt4</i>	Your requests through e- government can be delivered to your resident address (such as online claiming for delivering the retirement salary by post, delivery of government-subsidized goods, like sugar, rice, and bread for individual consumption, or as agriculture products for farmers, etc.).	
PESQ16	<i>Fulmnt5</i>	E government gives truthful accurate promises about the delivery of services.	
PESQ17	<i>Fulmnt6</i>	E government services' platforms are equipped with recent up to date information.	
PESQ18	<i>Fulmnt7</i>	The information provided by e- government services is precise.	
PESQ19	<i>Fulmnt8</i>	E government services contain the necessary information to fulfill your inquiries.	
PESQ20	<i>Fulmnt9</i>	The platforms of e- government services are available in other local languages besides the official language (Arabic). Some Syrian citizens speak these local languages as native languages such as Aramaic, Armenian, Assyrian, Kurdish, Turkish, and Syriac.	
PESQ21	<i>Fulmnt10</i>	The platforms of e- government services are available in international languages such as English, French, etc.	

Factor	Abbreviation	Items	Notes
<i>System content (Syscntnt)</i>			<i>2 items</i>
PESQ22	<i>Syscntnt1</i>	E government services contain the necessary related information about the formal regulations and laws concerning each service.	
PESQ23	<i>Syscntnt2</i>	E government services contain links to further useful information.	
Attitude toward using e-government services			5 items
	Att1	You find interacting via an e- government platform an appealing concept.	
	Att2	You find it a good idea to use e-government to fulfill your needs.	
	Att3	You like the idea of being one of the people who perform their needs using online channels.	
	Att4	You have negative impressions about e- services and prefer traditional channels (reversed coding).	
	Att5	Your attitude toward e-services is negative because e-services will replace traditional work, and many employees will become jobless (reversed coding).	
Perceived Trust			6 items
<i>Trust in e- government</i>			<i>4 items</i>
PT1	<i>PTeg1</i>	You believe that you can rely on e- government services to accomplish the available tasks.	
PT2	<i>PTeg2</i>	When you accomplish a task via an e- government service, you are sure that the task is definitely performed (E government provides guaranteed services).	
PT3	<i>PTeg3</i>	E government takes full responsibility for any insecurity or fault in performing transactions via its services.	
PT4	<i>PTeg4</i>	You feel confident to pay online by available means through e- government services.	
<i>Trust in government itself</i>			<i>2 items</i>
PT5	<i>PTg1</i>	You can trust the government to carry out online transactions faithfully.	
PT6	<i>PTg2</i>	You believe that government keeps your best interests in mind.	
Perceived Risk			2 items
	PR1	You feel that using online e- government services nowadays become less risky.	
	PR2	E government services are a safe way to perform financial transactions.	

Factor	Abbreviation	Items	Notes
Perceived Security			2 items
	PS1	E government services platforms have sufficient security features.	
	PS2	Using the credit card or payment methods accepted by e- government services is a safe way to perform financial transactions and protects you from fraud.	
Perceived Privacy (PP)			4 items
<i>Perceived Privacy of service quality PPsq</i>			<i>2 items</i>
PP1	<i>same PESQ10</i>	E government protects your information when used through its websites (Personal information, credit card, or bank account information).	
PP2	<i>same PESQ11</i>	E government doesn't share your personal information with other government entities (or any third party). But it is just concerned with the requested service.	
<i>Clarity of website privacy policy PpSite.clrty</i>			
PP3	<i>PpSite.clrty1</i>	When you use e- government services, you don't hesitate when you enter your personal information.	<i>2 items</i>
PP4	<i>PpSite.clrty2</i>	The privacy policy on e- government services pages is stated distinctly.	
Satisfaction of e-government (EgSAT)			10 items
	EgSAT1	You achieved your goals of using e- government services.	
	EgSAT2	Generally, you are satisfied with the online transactions provided by e- government.	
	EgSAT3	You are satisfied with the support/ feedback that you have received from e- government services.	
	EgSAT4	Generally, you are satisfied with the services provided by the e- government portal.	
	EgSAT5	E government websites meet your expectation.	
	EgSAT6	Engaging with online e- government services was a useful experience.	
	EgSAT7	Your decision to use e- government services was wise	
	EgSAT8	You enjoy using e- government to have your services	
	EgSAT9	As a result of your experience with e- government services, you would like to keep participating in online governmental services in the future.	
	EgSAT10	You would recommend using e- government services to others.	

Factor	Abbreviation	Items	Notes
Perceived uncertainty			3 items
	PUC1	In your opinion, the absence of personal contact in e-government services makes it hard to manage the task process.	
	PUC2	You don't feel the comfort to interact in a virtual environment.	
	PUC3	You consider that the absence of personal contact in e- government services produces uncertain results.	
Perceived Compatibility (personal compatibility) of e-government systems			2 items
	PC1	Interacting via the virtual environment suits your lifestyle	
	PC2	You prefer interacting via a virtual environment to personal contact with an employee.	
Perceived Usefulness/ Benefit			5 items
	PU1	Using e- government services is a faster way to perform needed tasks than the conventional way (using e- government services saves time).	
	PU2	Performing different tasks via e- government websites are more easily than the conventional way.	
	PU3	You believe that e-government provides you with valuable services.	
	PU4	The cost of using e- government services (internet costs and updating devices costs) is higher than the conventional government cost (reversed coded).	
	PU5	The diversity of choices, options, and functions of e- government services helped you to determine which is the exact service outcome you want (wide options and functions of those services enhanced taking the best choice)	
ICT Knowledge			3 items
	ICTK1	You have enough ICT knowledge to use ICT devices (computers, tablets, smartphones...).	
	ICTK2	You have enough ICT knowledge to use online applications.	
	ICTK3	You have the self-confidence to use e- government services properly.	
Literacy		Please select your education level: Primary, elementary, secondary, short cycle tertiary, Bachelor's or equivalent level; Second stage of tertiary, Master's or equivalent level, Doctoral or equivalent level.	1 item

Factor	Abbreviation	Items	Notes
Perceived ability to use ICT for interacting with e-government.			6 items
	PAict1	You can learn online interaction easily.	
	PAict2	The e- government services platforms structure is clear and comprehensible.	
	PAict3	You think that performing tasks through e-government services is easy.	
	PAict4	You have the confidence to use ICT devices (computers, tablets, smartphones).	
	PAict5	Generally, you don't want any help to manage the dealing of ICT devices (computers, tablets, smartphones) to do the tasks properly.	
	PAict6	You catch up with any modifications that may occur on e-government websites.	
Perceived Image of using e-government			1 item
	PIMG	Using e-government services gives you a special feeling of niche or differentiation in society.	
E government Adoption			4 Items
ADPT1	Int1	There is a high probability that you will keep performing your needed services which are available via e-government websites.	
ADPT2	Int2	You do not hesitate to provide information online via e- government websites.	
ADPT3		Even if you have other choices, you use e-government to fulfill your needs available via e-government services.	
ADPT4	EgSAT10	You would recommend using e- government services to others.	
Total items used in the first survey (without the digital divide)		78 different Items as each of Int1, Int2, EgSAT10, PP1 and PP2 are used in two scales.	83 Items
Digital Divide			12 items
	DD1	Generally, citizens have enough knowledge to use ICT by themselves, and thus they can perform their needed tasks online.	
	DD2	Government/ NGOs provide enough adequate ICT courses for users.	
	DD3	The ICT courses provided by the government/ NGOs are accessible to all.	
	DD4	There are solutions for users with special needs to use e- government, such as voice illustrator, voice respondent, accessibility option for better vision...	

Factor	Abbreviation	Items	Notes
	DD5	There is sufficient ICT infrastructure for ICT courses in public schools.	
	DD6	There is a well known specific website that gives information about national ICT courses.	
	DD7	Generally, citizens have sufficient resources to participate in e- government services (PC, Mobile, sufficient internet speed, online paying methods...)	
	DD8	Generally, workplaces have sufficient resources to participate in e- government services (PC, Mobile, sufficient internet speed, ...).	
	DD9	In your opinion, an adequate internet speed connection fee to use e-government services has a high cost (reversed coded).	
	DD10	Generally, citizens have the means to do their transactions online (credit card, online payment methods...).	
	DD11	Governmental offices provide sufficient places with sufficient infrastructure to participate in e-government services.	
	DD12	If the mother language (local languages) of some minority groups is not available on e- government platforms, they cannot use those platforms without help (reversed coded). “Some Syrian citizens speak these local languages as native languages, such as Aramaic, Armenian, Assyrian, Kurdish, Turkish, and Syriac”.	

Source: Author’s own development (2022).

9.2 Quantitative research

The quantitative research of this study will examine Only the Social group of factors due to time and budget limitations for an independent PhD dissertation to perform a field study covers all five groups of factors affecting e- government implementation, besides the hinders facing collaboration from politicians and formal employees necessary to conduct Political, Organizational and financial surveys in Syrian current conflict context, in addition to the priority of studying social as the results and recommendations need a long time to be processed into changes and overcome weaknesses in social regards (Harrikari and Rauhala, 2014).

As mentioned before in paragraphs 9.1.2 and 6.2.1, this research allocates an independent questionnaire for assessing the digital divide in Syria and allocating another questionnaire for measuring Adoption and Social factors affecting the Syrian e- government except for Digital Divide, both questionnaires build by using scales elaborated in the qualitative research of this study listed in Table11.

The research changed the order of some questions from Table 11 -before turning them into distributed questionnaires- regarding seamless sequence in reading the questionnaire by the respondents and other considerations, such as moving questions to the end of the questionnaire as the respondent's education level, due to the embarrassment may cause to those who are engaging in e- government with a lower education level, besides putting the items used in assessing more than one scale -such as the dimension “Perceived Privacy of service quality”- one time in the questionnaire.

9.2.1 Samples and distribution

As mentioned earlier, this research conducted two surveys, the first was conducted by distributing the questionnaire Nr1 for collecting data assessing Adoption and Social factors affecting the Syrian e- government except for the Digital Divide, and the second survey was conducted by distributing the questionnaire Nr2 for collecting data assessing the Digital Divide concerning Syrian case.

9.2.1.1 First survey/ Assessing Adoption and Social factors affecting e-government in Syria except Digital Divide

This study conducted a single cross-sectional survey design with a judgmental convenience sample by distributing 1100 questionnaires (resulting in 1005 valid responses) regarding the Syrian population distribution. This distribution took into account gender and regional ratios. Here, the study should mention that regarding the regions’ distribution, the respondents who belong to cities and regions which are not under Syrian government control, the research has selected them among those who were displaced during the current Syrian conflict to cities under the Syrian government control, and familiar with the situation and have enough connections with their original residence before displacement, this was a vital condition for considering the respondents.

Based on UNDP Human Development reports (2019b) mentioned in paragraph 7.2, the Syrian population in Syrian territory is estimated at 16.9 million inhabitants in 2018, meaning that the research sample forms about 0.06 per thousand of the total Syrian population living in Syrian territory.

The geographic and gender distribution of the questionnaire Nr1.

This research planned a matrix for distributing the questionnaire Nr1 depending on the estimation of the population distribution in Syria by governorates in 2016, shown in Table 6, and on the gender distribution in Syria in 2019, shown in Figure 6.

The distribution matrix aims to assure that the collected sample is well presents the studied society.

Also, the distribution didn't cover the age group under 18 years old since it is not practically involved in e- government usage (except for the e- learning service, which is not offered in the Syrian e- government case), so the age group under 18 years old needs an individual study and is not a concern of this study.

Also, this research didn't draw a plan for distributing the questionnaire over age segments but distributed the questionnaire conveniently over the age groups between 18- 65 years old.

The research started to distribute the questionnaire conveniently in the main cities (the cities which are under Syrian government control).

The research made a statistical process regarding the region and gender ratios of gained respondents and compared their numbers with the real population distribution ratios according to the statistics of CIA Factbook (2020), Syrian Central Bureau of Statistics (2018) Table 6, and corresponding statistics in paragraphs 7.1 and 7.2.

After that, the research moved to the second stage, targeting to reach specific respondents of specific regions and genders until the research reached a distribution that matched the real population distribution.

When the distribution reached the target planned number of any region or gender in the distribution matrix, the research stopped distributing the questionnaire to this targeted segment.

The planned matrix for the targeted sample resulted in 1005 valid responses shown in Table 12.

Table 12. Geographical and gender distributing matrix of the valid responses to the questionnaire Nr1.

Place of distributed questionnaire	Total Nr of questionnaire	Original governorate of the respondent	Nr of questionnaire	Gender
Damascus	297	Damascus	95	48 Female
				47 Male
		Idleb	17	5 Female
				12 Male
		AL-Hasakeh	45	21 Female
				24 Male
		Deir-ez-Zor	38	17 Female
				21 Male
		AL-Rakka	34	15 Female
				19 Male
		Daraa	40	20 Female

Place of distributed questionnaire	Total Nr of questionnaire	Original governorate of the respondent	Nr of questionnaire	Gender
				20 Male
		AL-Sweida	24	12 Female
				12 Male
		AL-Quneitra	4	2 Female
				2 Male
Rural Damascus	139		139	69 Female
				70 Male
Aleppo	175		175	88 Female
				87 Male
Homs	74		74	37 Female
				37 Male
Hama	93		93	46 Female
				47 Male
		Latakia	69	35 Female
				34 Male
		Idleb	41	23 Female
				18 Male
Latakia	151	AL-Hasakeh	24	13 Female
				11 Male
		Deir-ez-Zor	10	6 Female
				4 Male
		AL-Rakka	7	5 Female
				2 Male
		Tartous	53	27 Female
				26 Male
		Idleb	10	6 Female
				4 Male
Tartous	76	AL-Hasakeh	8	5 Female
				3 Male
		Deir-ez-Zor	5	3 Female
				2 Male
Idleb	No questionnaire was distributed because the whole governorate is out of Syrian government control, and it is an unsafe place due to the open conflict, multi-rebels, and militias control. The		68 Distributed in:	34 Female

Place of distributed questionnaire	Total Nr of questionnaire	Original governorate of the respondent	Nr of questionnaire	Gender
		displacement persons from this governorate who still have connections are the target to answer this questionnaire.	Damascus, Latakia and Tartus cities.	34 Male
AL-Hasakeh		No questionnaire was distributed because of the unstable situation. The people of this governorate who live temporarily or on a short visit to other governorates and still have connections are the target to answer this questionnaire.	77 Distributed in: Damascus, Latakia and Tartus cities.	39 Female
				38 Male
Deir-ez-Zor		No questionnaire was distributed because of the unstable situation. The people of this governorate who live temporarily or on a short visit to other governorates and still have connections are the target to answer this questionnaire.	53 Distributed in: Damascus, Latakia and Tartus cities.	26 Female
				27 Male
AL-Rakka		No questionnaire was distributed because of the unstable situation. The people of this governorate who live temporarily or on a short visit to other governorates and still have connections are the target to answer this questionnaire.	41 Distributed in: Damascus and Latakia cities.	20 Female
				21 Male
Daraa		No questionnaire was distributed because of the unstable situation. The people of this governorate who live temporarily or on a short visit to other governorates and still have connections are the target to answer this questionnaire.	40 Distributed in: Damascus city.	20 Female
				20 Male
AL-Sweida		No questionnaire was distributed because of the unstable situation. The people of this governorate who live temporarily or on a short visit to other governorates and still have connections are the target to answer this questionnaire.	24 Distributed in: Damascus city.	12 Female
				12 Male
AL-Quneitra		No questionnaire was distributed because of the unstable situation. The people of this governorate who live temporarily or on a short visit to other governorates and still have connections are the target to answer this questionnaire.	4 Distributed in: Damascus city.	2 Female
				2 Male
Total			1005	503 females (50.05%), 502 males (49.95%).

Source: Author's own development (2022).

9.2.1.2 Second survey/ Assessing Digital Divide in Syria survey

The second survey of the quantitative study is allocated to collect data for assessing the Digital Divide in Syria.

The cause of allocating an independent questionnaire for the Digital Divide (as mentioned earlier in paragraph 9.1.2) is that the intended Social questionnaire sample for quantitative analysis targeting 1100 respondents is not enough to measure the Digital Divide, which is like the surveys allocated for measuring e- government indices need statistics, censuses, and big quantitative data exceed the possibilities of individual research in cost and time frame, but possibilities of governments or international organizations such as UN, OECD, Eurostat, etc. (United Nations, 2014b). Depending on this, and in line with the method assessing EG7 (E-government level 7)⁹ accepted by United Nations

⁹EG7: Selected Internet-based services available to citizens, by level of sophistication of service, The Internet-based services for which information is sought are:

Enroll to vote for the first time in government elections., Complete and lodge personal income tax return, least complex situation., Obtain unemployment income benefits, least complex situation., Obtain child support allowance, least complex situation., Renew an international passport, least complex situation., Renew a driver's license, least complex situation., Make an official declaration of theft of personal goods (excluding motor vehicle and burglary) to the relevant

Manual for measuring e-government that directs the questionnaire to national experts (United Nations, 2014b, p. 39), the Digital Divide questionnaire developed by this study was addressed to the insiders and national experts in Syrian e-government issues who are familiar with the related statistics.

Thirty-four questionnaires for measuring the digital divide in Syria were distributed to national experts and individuals with sufficient knowledge of the Syrian ICT situation.

9.2.2 Validity and reliability of the scales

This study confirmed the validity of the scales used to measure social factors affecting e-government, as mentioned earlier in this research, by presenting scales to three experts concerned in the e-government field who confirmed the validity of the scales.

Furthermore, the internal consistency of the scales was tested by using Cronbach's alfa reported values exceeding 0.7 criteria set by Nunnally (1979) that confirm the reliability of the scales. The results of Cronbach's alfa test for all scales are shown in Table 13.

Table 13. Results of Cronbach's Alpha test for internal consistency of the scales used in quantitative research.

Scales used to measure social factors	Number of items	Cronbach's Alpha
Perceived Awareness	3	0.87
Willingness/ Attitude to use e-government	3	0.93
Perceived Quality of e- service	23	0.705
Attitude	5	0.88
Perceived Trust	6	0.88
Perceived Risk	2	0.91
Perceived Security	2	0.93
Perceived Privacy	4	0.82
Satisfaction of e- government.	11	0.81
Perceived Uncertainty	3	0.89
Compatibility of e- government systems	2	0.92
Perceived Usefulness/ Benefit	5	0.91
ICT Knowledge	3	0.84
Literacy	1	One item, no test performed.
Perceived ability to use ICT	6	0.78
Perceived Image of using e-government.	1	On item, no test performed.
Adoption	4	0.78
Digital Divide	12	0.88

Source: Author's own development (2022).

police., Obtain a copy of a birth certificate for self., Obtain a copy of a marriage certificate for self., Renew registration for a motor vehicle least complex situation (United Nations, 2014b, p. 25).

10. RESULTS AND DISCUSSIONS

10.1 Sample background analysis

This research distributed the social survey on a planned sample base following the statistics of the Syrian population regarding gender and governorate affiliation, see Figure 8 and Table 12.

The females form 50% of respondents, and 50% are males. These ratios match real gender percentages in Syria in 2018, according to the CIA Factbook (2020) and the Syrian Central Bureau of Statistics (2018).

Two percent of respondents completed only primary education (first education cycle), 16% completed only the second education cycle (preparatory), 45% have at least secondary education, 25% have a bachelor's degree, 10% master's degree, and 2% have a Ph.D. degree, Figure 7.

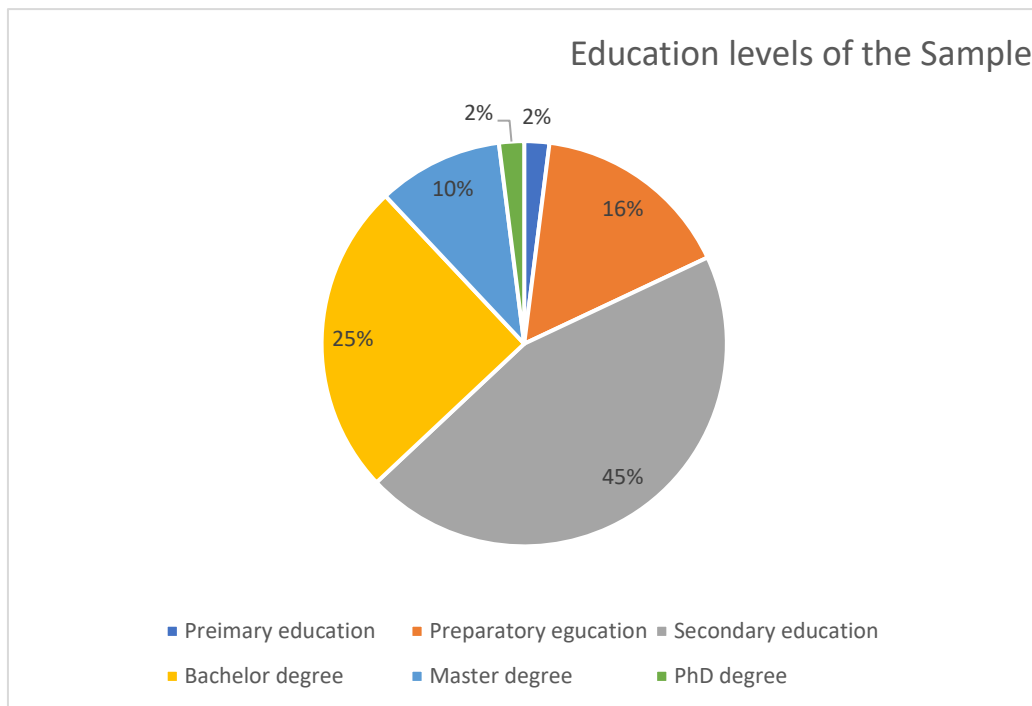


Figure 7. Education levels of the sample.
Source: Author's own development (2022).

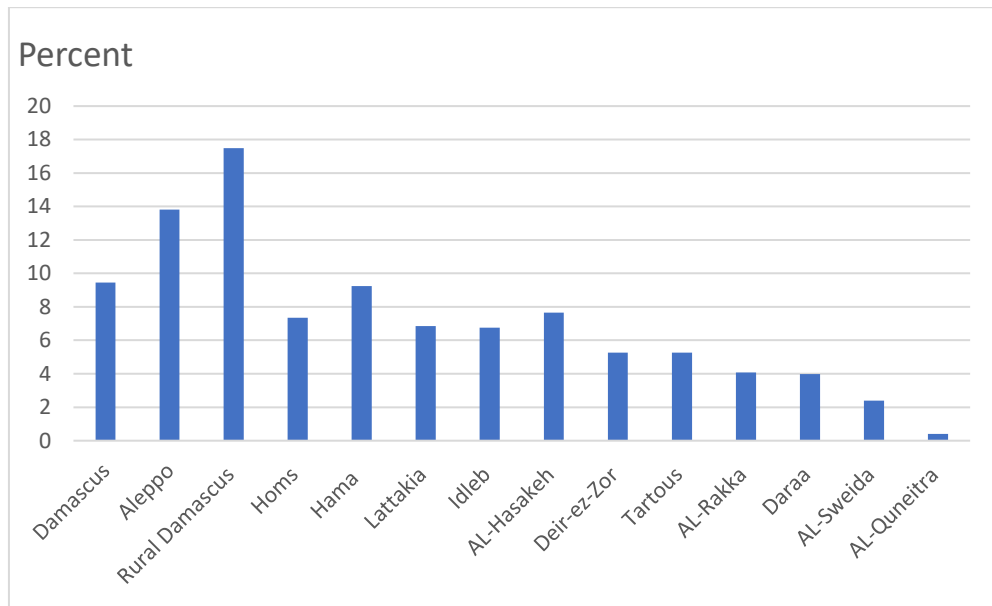


Figure 8. Syrian population percentage distribution among governorates.

Source: Author’s own development (2022), depending on Syrian Central Bureau of Statistics census of the year 2016, (Syrian Central Bureau of Statistics. 2017).

Analyzing the age groups percentage of the sample, we can notice differences from the official distribution of the Syrian population over age segments described in paragraph 7.2 because this research used different age segment distribution illustrated in Figure 9, besides some of the age segments, due to the current conflict in Syria, have moved out of Syrian territory seeking for a safer place or a better economic situation.

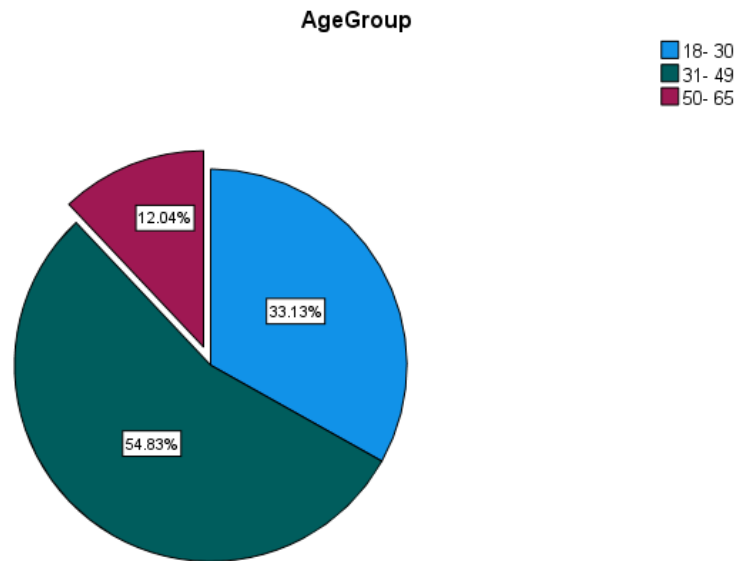


Figure 9. Sample age groups distribution.

Source: Author’s own development (2022)

10.2 Statistical data analysis

For analytical purposes, this study developed new variables from the answers of the responses for each scale collected in the questionnaires to use in analysis by giving the mean answer of all items of each scale for every respondent. Those new variables are:

The Overall Perceived Awareness, Overall Intention (Willingness) to use e-government services, Overall Perceived e-government services Quality, Overall Attitude toward using e-government services, Overall Perceived Trust, Overall Perceived Risk, Overall Perceived Security, Overall Perceived Privacy, Satisfaction with e-government, Overall Perceived uncertainty, Overall Perceived Compatibility (personal compatibility) of e-government systems, Overall Perceived Usefulness/Benefit, Overall ICT Knowledge, Overall Perceived ability to use ICT for interacting with e-government, Overall e-government Adoption, and Overall Digital Divide.

The variables “Perceived Image of using e-government” and “Literacy level” were used directly without evolving new variables because they are single-item scales.

This research starts analysis by assessing Social factors affecting the Syrian e-government by calculating the mean answers of each factor, then comparing its value with the middle scale value, which is (3), as the research used the 5 points Likert scale in assessing all measuring items.

SPSS program is used in all data analysis.

10.2.1 Citizens' Perceived Awareness of Syrian e-government

The mean answer of overall perceived awareness reaches 2.8 and significantly less than 3 (the middle of the scale) due to the result of one sample T-test shown in Table 14, (P value $< \alpha = 0.05$), that means the awareness of most Syrian citizens about the national e-government is weak.

More analysis was performed to explain this result.

Fifty-five percent of respondents were familiar with the e-government term before they heard the brief explanation about e-government presented prior filling out the questionnaire.

The brief explanation given during the distribution of the questionnaire prompted the respondents to rethink the concepts and applications they encountered in real life that may be related to e-government.

Forty-five percent of the respondents are aware of the Syrian e-government as their mean answers of awareness of the national e-government exceed the middle of the scale on the five-point Likert scale, but only 15% of respondents are not aware of the Syrian e-government aspects at all.

A deeper analysis of this result shows that the item measures training in the use of e-government ("You have trained to know about all the capacities of e-government service") has the most extremist negative answer as 94% of respondents did not receive enough training on e-government services in Syria.

Furthermore, an investigation of the open question in the pilot survey that asked what kind of services provided by the Syrian e-government the respondent knew about, those services were such as electricity and telephone bill inquiry and pay, registering for issuing a new passport, registering for government-subsidized goods and alike.

In another reading of previous results, there is a clear weakness in training campaigns to explain the possibilities of e-government services.

Table 14. One-Sample Test for Citizens' Perceived Awareness of Syrian e-government.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
PA.Overall	1005	2.8060	1.02613	.03237

One-Sample Test						
Test Value = 0						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PA.Overall	86.689	1004	.000	2.80597	2.7425	2.8695

Source: Author's own development (2022).

10.2.2 Perceived Service Quality of Syrian e-government

Eighty-six percent of respondents didn't see services provided by the Syrian e-government are good, with bad indices for most of the perceived service quality measuring items, except for two items of system availability dimension their mean answers exceeded the middle of the scale (3) with mean answers of this dimension (3.5). Moreover, this dimension consists of three items (see Table 11) SA1 and SA2 have positive mean answers concerning e-government availability websites 24/7 from everywhere, and SA3 with a negative mean answer about the performance of those websites concerning issues like website freezing, crashing, etc.

The rest of the perceived service quality dimensions mean answers were negative and below the middle of the scale (3), with one exception being almost neutral; they are 2.3, 2.2, and 2.4 for efficiency, fulfillment, and system content, whereas respondents mean answers of e-government websites privacy (relating to service quality PPsq) almost neutral reaching 3.1.

The mean value of all answers of perceived service quality express overall perceived service quality, apparently has a negative indication with 2.7 and significantly below the middle of the scale as a result of one sample T-test illustrated in Table 15 (P value $< \alpha = 0.05$), also, Appendix I contains results of one sample T-test for system availability, efficiency, fulfillment, system content, and perceived privacy (relating to service quality).

The significance of differences among e-government Perceived Service Quality dimensions approved by conducting Paired Sample T Test listed in Appendix II.

Table 15. One-Sample Test for Perceived service quality of Syrian e-government.

	One-Sample Statistics			
	N	Mean	Std. Deviation	Std. Error Mean
PESQ.Overall	1005	2.7114	1.01105	.03189

	One-Sample Test					
	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper	
PESQ.Overall	9.048	1004	.000	.28856	.3511	.2260

Source: Author's own development (2022).

More analysis shows the mean answer to one of the two questions/items that measure the perceived privacy dimension of perceived service quality PPsq "E-government doesn't share your personal information with other government entities (or any third party). But it is just concerned with the requested service" has a negative direction less than the middle of the scale reaching 2.2. This means the respondents have suspicions about e-government, that it may share their personal information with other governmental entities, whereas most of the respondents see that e-government protects their privacy related to financial transactions, as the mean answer to this question reaches 4; "E-government protects your information when used through its websites (Personal information, credit card, or bank account information)". This result pays attention to the weakness in the government's ability to convince citizens that e-government preserves their privacy by dealing with users anonymously during data analysis, hence the government has to investigate the source of these suspicions, if there is a real intervention in privacy done by governmental agencies through the applications, or generated from a lack of trust in government itself as will be discussed later in paragraph 10.2.3, or from other reasons.

Another looking at the results of citizens' opinions about e-government website efficiency (Efncy overall mean = 2.3 as mentioned before), respondents have a negative evaluation of all items assess this dimension of perceived service quality as they see e-government services' websites not simple nor easy to deal with, they cannot accomplish their tasks through them quickly, and don't provide precise up to date necessary information.

Also, because of the long and inaccurate timeframe of e-government services delivery, respondents have a negative opinion about e-government services fulfillment, conveyed by the answers to questions measuring the fulfillment dimension (Fulmnt). Moreover, we can distinguish negative mean answers to the questions that assess the availability of the website's content and instruction in other local languages besides the international and official languages (The Items Fulmnt9, 10 in Table 11), which hinders some users from utilizing the services of e-government and may lead to an increase in the digital divide, as will be discussed later in paragraph 10.2.17.

10.2.3 Perceived Trust in Syrian e-government

Moving on to reveal respondents' perceived trust in e-government services, we look at the mean answer of respondents to the questions that measure perceived trust (overall PT).

The mean answer of Overall PT reaches 2.9, which shows a little bias to negative. This means citizens have a relatively neutral tendency to trust e-government services, with a little bias to be negative.

Going more in detail, as discussed earlier in this research, Perceived Trust is divided into two dimensions; trust in e-government and trust in the government itself (Alomari et al., 2009).

The analysis result shows that respondents' trust in e-government (4 items) is positive with a mean answer of 3.2, whereas the mean answer of respondents' trust in government itself (2 items) is negative with only 2.4.

Here, this study advises the government to put plans that aim retaining back the citizens' trust in public institutions by organizing promotional campaigns to shed light on the reliability of government services.

Even though people trust e-government in general as their mean answer to this dimension is 3.2, as mentioned above, people don't trust that e-government will take responsibility for any online insecurity or any error that might occur during dealing with the online portal, and corrects the mistakes, as the mean answer of the question/ item PT3 "E-government takes full responsibility for any insecurity or fault in performing transactions via its services." is only 2.5, this result, from one side indirectly implies signs of weakness in citizens' trust in the government itself as the e-government decision -to take responsibility for correcting mistakes- is taken by officials, from the other side, people don't see e-government systems have potentials to correct mistakes automatically through programmed revisions and feedback procedures, or any possibility enables users to correct mistakes. For example, if a user entered data in an online transaction and realized later it has a defect, then she/he wants to correct it, or a user accidentally transferred a higher amount for a bill to a public organization and wants to claim access amount, or a citizen has been subject to fraud But, this low trust in e-government responsive behavior faces a high trust in paying through the e-government, as the mean answer of PT4 "You feel confident to pay online by available means through e-government services" reaches 3.9, meaning that people see the general automated system is protected from manipulation, regardless of their conviction that the e-government doesn't take responsibility for any mistakes that might happen accidentally.

Moreover, people's evaluation of the creditability of e-government by providing guaranteed services PT2 "When you accomplish a task via an e-government service you are sure that task is definitely performed" was almost neutral with little tendency to be positive with mean answer 3.15. Also, citizens expressed positive conceive of e-government reliability PT1 "You believe that you can rely on e-government services to accomplish the available tasks" with mean answer 3.25. Here, the research sees the promising of the last two results to build trust in the Syrian e-government, so, it is a good opportunity for responsible governmental agencies to boost those positive perceived ideas among people of reliability and creditability of e-government by enhancing the quality and speed of e-government services delivery accompanied with planned campaigns and promotion of benefits and advantages of using them.

Furthermore, low trust in the government itself is driven by citizens' perception that government doesn't consider peoples' interests PT6 "You believe that government keeps your best interests in mind." with a mean answer of only 1.8, and this is a normal result of long years of war and collapsed economy, as peoples in general blame governments for bad economic situations regardless of the causes (Tilley et al., 2018). On the other hand, the respondents' mean answer of PT5 "You can trust the government to carry out online transactions faithfully." was natural by reaching 3 (the middle of the scale), here some of the interviewees in the focus groups (during the qualitative study of this research) suggested that low trust in government to some extent was driven by some manipulating cases done by some officials who took advantage of the war situation in the current Syrian conflict, but this opinion needs more investigation to reveal the drives behind this perception.

At last, one sample T-test shows that the mean answer of overall Perceived Trust does not significantly differ from 3 (the middle of the scale) Table 16. This result gives the impression that Syrian Citizens, in general, may have a neutral trust in the national e-government more than a negative trust since the overall trust mean is 2.92 that very close to the middle of the scale, here this research sees an opportunity to flip this result to be positive by concentrating governmental efforts on performing campaigns and promotions about how e-government deals with information, process data, and protect the personal information.

Table 16. One-Sample Test for Perceived Trust in Syrian e-government.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Overall Perceived Trust	1005	2.925	1.0027	.0316

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall Perceived Trust	2.359	1004	.051	.0746	.013	.137

Source: Author's own development (2022).

To ensure the reliability of perceived trust results, this study conducted one sample T-test to be sure that the mean answer of Perceived Trust dimensions significantly differs from 3 (the middle of the scale). The results shown in Appendix I confirm the significance of the tests since the P value for all tests $< \alpha = 0.05$.

Furthermore, the research carried out paired sample T-test between the two dimensions of Perceived Trust; Trust in e-government and Trust in government itself, the results in Appendix II confirmed the significant difference between them.

10.2.4 Perceived Risk using Syrian e-government

One of the positive opinions that respondents showed toward Syrian e-government related to perceived risk is that they tend to see services provided by e-government as not risky to use, as the mean answer of this item reaches 3.5, which demonstrates that they see online services become less risky nowadays. Also, respondents considered e-government as a safe channel concerning financial transactions with the mean answer of this item reaching 3.7.

The above results show that citizens see it as not risky to use the Syrian e-government, with an overall perceived risk (PR) mean answer reaching 3.6, and significantly over the middle of the scale, as one sample T-test results confirm in Table 17.

Table 17. One-Sample Test for Perceived Risk using Syrian e-government.

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
PR.overall	1005	3.6269	.92824	.02928		

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PR.overall	21.409	1004	.000	.62687	.5694	.6843

Source: Author's own development (2022).

10.2.5 Perceived Security of Syrian e-government websites Perceived trust in Syrian e-government

Another important positive evaluation of e-government is website security with overall Perceived Security (PS) mean answer of 3.77. This result gives no doubts that respondents see e-government as a secure channel for performing financial transactions with sufficient security features website. This study performed one-sample T-test to ensure that the overall Perceived Security mean answer significantly exceeds 3 (the middle of the scale) and confirmed by the result in Table 18 (P value < α = 0.05).

Table 18. One-Sample Test for Perceived Security of websites Syrian e-government.

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
PS.overall	1005	3.7711	.87992	.02776		

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PS.overall	27.783	1004	.000	.77114	.7167	.8256

Source: Author's own development (2022).

10.2.6 Perceived Privacy of Syrian e-government

Perceived Privacy is discussed partially in paragraph 10.2.2 as a dimension of Perceived Service Quality PPsq with the two items PESQ15 (PP1) and PESQ16 (PP2), also, Perceived Privacy -as discussed in the developing scales paragraph- enfolds besides to PPsq- the Clarity of the website privacy policy (PPp.clrty) which consists of the items (PP3) and (PP4). See Table 11.

In general, respondents tend to consider that e-government has a slight weakness in providing privacy through its websites as the mean answer of the Overall Perceived Privacy reaches 2.9, which is an almost neutral opinion, the two dimensions of perceived privacy (PPsq) and (PPp.clrty) have mean answers reaching 3.1 and 2.7 in sequence. The latter result will be addressed through this research to the Syrian e-government responsible affiliates to enhance the clarity of privacy policy through its websites.

This study performed one sample T-test to ensure that the overall Perceived Privacy mean answer significantly exceeds 3 (the middle of the scale) and confirmed as P value < $\alpha = 0.05$, Table 19.

Furthermore, the research carried out a paired-sample T-test among the two dimensions of Perceived Privacy of e-government websites; Perceived Privacy of service quality (PPsq), and Clarity of website privacy policy (PPp.clrty), the results confirmed the significant difference between them, Appendix II.

Table 19. One-Sample Test for Perceived Privacy of Syrian e-government.

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
Overall Perceived Privacy	1005	2.8955	1.01974	.03217		

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall Perceived Privacy	3.248	1004	.001	.10448	.0414	.1676

Source: Author's own development (2022).

10.2.7 Perceived Satisfaction with Syrian e-government

No doubt that respondents are not satisfied with e-government services as the mean answer of services Satisfaction recorded 1.8, which is distinctly lower than 3 (the middle of the scale). Further investigation declares that most of the items measuring satisfaction have almost neutral values, a deep search for the extreme values of items measuring this satisfaction, that pulled down this result, we can find that satisfaction with enjoyment using e-government to have services is very low with 1.1, and a similar result was found for the support/ feedback provided by e-government services with 1.2, those two results draw attention to the necessity for rebuilding e-services' websites in a way that makes interaction via e-government an enjoying experience and to the necessity for boosting support and feedback to the users as e-government is still new for most Syrians, and they need help to proceed with these services in the first period of use, and this complies with the result of assessing respondents' overall Perceived Ability to use ICT (paragraph 10.2.11), which reached 2.5, i.e., most of the users need some help during dealing with e-government services platforms.

To ensure that the overall Satisfaction mean answer significantly exceeds the middle of the scale (3), one sample T-test was conducted and confirmed this result as P value < $\alpha = 0.05$, Table 20.

Table 20. One-Sample Test for Overall Satisfaction with Syrian e-government.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
EgSAT.overall	1005	1.8209	.66032	.02083

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
EgSAT.overall	56.609	1004	.000	1.17910	1.1382	1.2200

Source: Author's own development (2022).

10.2.8 Perceived Uncertainty dealing with Syrian e-government

The Perceived Uncertainty (PUC) among respondents is high, as the mean answer of the overall Perceived Uncertainty PUC reaches 3.8.

More analysis within the items consisting PUC shows that most respondents prefer to deal with employees physically to guarantee task processing (PUC3 "You consider that the absence of personal contact in e-government services produces uncertain results." mean answer 3.9), and the respondents generally don't feel the comfort of interacting via the virtual environment (PUC2 "You don't feel the comfort to interact in a virtual environment." mean answer 3.7), besides to the users' perception that hurdles may confront them in managing online tasks without employees help (PUC1 "In your opinion, the absence of personal contact in e-government services makes it hard to manage the task process." mean answer 3.8).

The study ensured that the mean answer of overall Perceived Uncertainty significantly exceeds 3 (the middle of the scale) by performing One-sample T-test, as P value < $\alpha = 0.05$, Table 21.

Table 21. One-Sample T-test for Perceived Uncertainty dealing with Syrian e-government.

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
Overall Perceived Uncertainty (reversed coded)	1005	3.7910	.91801	.02896		

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall Perceived Uncertainty (reversed coded)	27.317	1004	.000	.79104	.7342	.8479

Source: Author's own development (2022).

10.2.9 Perceived Syrian e-government Compatibility with users' personality

In regard to assessing perceived compatibility (personal compatibility), most of the respondents 64.2% don't feel that performing tasks via e-government websites is compatible with their personality, also, the mean answer of the whole sample of the overall Compatibility with users' personality is 2.6, as they see dealing with e-government as far from their lifestyle and prefer personal interacting is more preferable.

Table 22., shows overall Perceived e-government Compatibility with users' personalities significantly below 3 (the middle of the scale), as P value = 0.000 < $\alpha = 0.05$ in one-sample-T-test results.

Table 22. One-Sample Test for Perceived Syrian e-government Compatibility with users' personality.

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
Perceived overall Compatibility	1005	2.6119	1.34958	.04257		

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Perceived overall Compatibility	9.116	1004	.000	-.38806	-.3045	-.4716

Source: Author's own development (2022).

10.2.10 Perceived Usefulness/ benefits dealing with e-government

Despite that many results assessing respondents' opinions toward e-government services tend to be negative, we can find a distinctive positive result about the Perceived Benefit or Usefulness of using e-government services, as 74% of respondents confirm the usefulness of e-government and its benefits, 18% have a neutral opinion and only 8% don't agree on the usefulness of using e-government services, the mean answer of overall Perceived usefulness is 3.9, this result confirms that Syrian citizens value the usefulness and benefits of using e-government to perform their tasks, regardless of the other aspects that hinder their intention to use it, here, the government has to take the opportunity to enhance the adoption of e-government by overcoming the negatives that come from the other factors while citizens are still convinced by the importance and relevance benefits of using e-government, this should be done as soon as possible before the negatives overshadow the positive conviction and form steady obstacles toward adoption of e-government difficult to overcome.

One sample T-test confirmed that the overall Perceived Benefits mean answer significantly exceeds 3 (the middle of the scale), as P value < $\alpha = 0.05$, Table 23.

Table 23. One-Sample Test for Perceived Usefulness/ benefits dealing with e-government.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Overall Perceived Usefulness	1005	3.8856	.87109	.02748

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall Perceived Usefulness	32.229	1004	.000	.88557	.8317	.9395

Source: Author's own development (2022).

10.2.11 ICT knowledge and ability to use ICT for interacting with e-government

This paragraph deals with two variables; overall ICT Knowledge (ICTK) and overall Perceived Ability to use ICT for interacting via e-government portal (PAict), as this research will conduct comparisons between the analysis results of those variables.

Most of the respondents (69%) feel that they have enough ICT knowledge, but, this percentage is higher among respondents between 18- 49 years old reaching (85%), whereas it is much lower among respondents between 50- 65 years old (15%), these results give a conceive that citizens under 50 years old are ready to deal with ICT devices necessary to interact with e-government, here if e-government wants to leave no one behind, has to start initiatives to spread ICT knowledge among older generations above 50 years old.

From another perspective, the mean answer of the overall ICT Knowledge reaches 3.2, which is not very far from the middle of the scale.

More analysis tells that the respondents have low self-confidence to use e-government services properly (the mean answer of this item of 2.6) despite that the respondents have high knowledge of using ICT devices and online applications (the mean answers are 3.7, 3.3 in sequence), this discussion revealed one of the important weaknesses which hinder e-government implementation (the low self-confidence to use e-government), depending on that, the government has to find solutions to raise citizens' self-confidence in using e-government services by starting national training campaigns on using e-government.

In the same context, most of the respondents (64.8%, 651 respondents) feel they have the ability to use ICT for interacting with e-government, also, this percentage is higher among respondents between 18- 49 years old reaching 96% (625 respondents), whereas it is much lower among respondents between 50- 65 years old with only 4 % (26 respondents), the latter forms 28.3% of all respondents of the sample between 55- 64 years (the total number of respondents between 50- 64 years old is 92 respondent).

The mean answer of "overall Perceived Ability to use ICT for interacting via e-government portal" (PAict) reaches 2.8, comparing this result with the "overall ICT knowledge" mean answer of 3.2, leads to the conclusion that Syrians, even if they have enough ICT knowledge in general, they are not familiar to deal with the services provided by the Syrian e-government.

The latter conclusion is supported by item PAict5 "Generally, you don't want any help to manage the dealing of ICT devices (computers, tablets, smartphones) to do the tasks properly." with a mean answer of only 2.2, also supported by item PAict3 "You think that performing tasks through e-government services is easy" with a mean answer of 2.4.

Furthermore, the respondents don't see e-government platforms are clear and understandable with the mean answer of item PAict2 reaching 2.3, whereas the mean answer of item PAict4 measures ICT confidence "You have the confidence to use ICT devices (computers, tablets, smartphones)." reaching 3.8.

Nevertheless, Syrians expressed their ability to learn easily by interacting online with a mean answer of item PAict1 reaching 3.3, but people are not sure if they can catch up with any modifications that may occur to e-government websites (PAict1 mean answer of 2.8).

Those result drive us to the same previous conclusion that government has to starts national training campaigns on using e- government to increase citizens’ self-ability to use ICT’s for interacting with e- government independently, especially for older generation.

To ensure that the mean answer of each of ICT knowledge and Perceived Ability to use ICT for interacting with e-government portal are significantly differs from 3 the middle of the scale, One Sample T test conducted and confirmed as P value < $\alpha = 0.05$ for two scales, Table 24. Moreover, the results in Appendix II of Paired Sample T test between two mentioned variables confirmed the significant difference between Citizens’ ICT knowledge and their Perceived Ability to use ICT for interacting with e-government.

Table 24. One-Sample Test for ICT knowledge and ability to use ICT for interacting with e-government.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Overall ICT Knowledge	1005	3.1990	1.03725	.03272
Overall Perceived Ability to use ICT	1005	2.7861	1.08365	.03418

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall ICT Knowledge	6.082	1004	.000	.19900	.1348	.2632
Overall Perceived Ability to use ICT	6.258	1004	.000	.21393	.1469	.2810

Source: Author’s own development (2022).

10.2.12 The Impact of Education level on Intention to use e-government

Surprisingly, in reverse to the expected result, there is no significant impact of Syrian citizens’ Education Level on their intention to use e-government, as the correlation test between the two variables denotes no significant relation as P- value = $0.744 > \alpha = 0.05$ (Correlation test used Kendall's tau-b (τ_b) correlation coefficient), Table 25, this surprising result with the large sample of 1005 respondents -which forms about 0.05% (0.5 per thousand) of the Syrian population calculated dependent on the Syrian population estimated by The World Bank in 2021 which reaches 21,324,367 (World Bank Website, 2021b)- goes against the common consensus in the literature on the relationship between education level and intention to use e-services in general, this drives the research to suppose that the other factors affecting e-government in Syria succeeded in hiding the impact of education level, the same result for the impact of Education level on the Adoption of e-government as will see in paragraph 10.3.3.4.

Table 25. Correlation test between Education level and intention to use e-government.

			Correlations	
			Education Level	Overall intention to use e-government
Kendall's tau_b	Overall intention to use e-government	Correlation Coefficient	.009	1.000
		Sig. (2-tailed)	.744	.
		N	1005	1005

Source: Author's own development (2022).

10.2.13 Perceived Image of using e-government

Investigating the respondents' Perceived Image of using e-government (PIMG) shows that most of the respondents (90%) expressed the specialty of persons who use e-government to fulfill their needed services with a mean answer reaching 3.7, this result is an advantage to the Syrian e-government and would boost citizens' adoption if Syrian government concentrates on implementing the national e-government fast enough and overcomes the weaknesses and hinderers in a suitable time frame before this image fades away.

One sample T-test results in Table 26 confirm that the mean answer of the overall Perceived Image of using e-government (PIMG) significantly exceeds 3 (the middle of the scale), as $P \text{ value} = 0.000 < \alpha = 0.05$.

Table 26. One-Sample Test for Perceived Image of using e-government.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Perceived Image of e-government user	1005	3.7065	.91382	.02883

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Perceived Image of e-government user	24.508	1004	.000	.70647	.6499	.7630

Source: Author's own development (2022).

10.2.14 Syrian citizens' Intention toward using e-government

Moving to assess citizens' intentions toward using the national e-government, the research found that 16% of respondents (161 respondents) have this intention, 26% (261 respondents) have a neutral intention, and 58% (583 respondents) don't intend to use e-government, with a mean answer of overall Intentions toward using e-government 2.9, this result seems close to neutral with a little tendency to be negative, but more analysis to investigate this relative negative result according to relative low intention percentage among respondents (only 16%), the research found that the respondent who has the intention to use e-government (the 16% of respondent), has a high positive bias to outliers positive answers with mean answer reaches 4.5, which reveals a clear decision of them choosing to use e-government whenever they have the chance, whereas the majority of respondents (58%) don't tend to use e-government with mean answer 2.4, which is much closer to the middle of the scale than the previous mean (4.5), here, in theory, people with negative intention need fewer efforts to change their intention toward using e-government to be positive than those who have a positive intention to be negative as their opinion is much far from the middle of the scale by more than double, but this conclusion is weak and need extended research.

On another side, there is a respectful amount of respondents have a neutral intention (26%) toward using e-government, those are very important, since they, with some efforts, may change their intention to the positive side, here this research encourages the Syrian government to conduct expanded research on those who have a neutral intention toward using e-government to know exactly the obstacles that hinder them from deciding to use e-government, and another research focuses on people with the more negative willingness to use e-government.

The research conducted one sample T-test that confirmed the overall Intention differs from 3 (the middle of the scale), as the P value 0.023 is less than $\alpha = 0.05$, Table 27.

Table 27. One-Sample Test for testing Syrian citizens' Intention toward using e-government.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Overall intention to use e-government	1005	2.9204	1.10848	.03497

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall intention to use e-government	2.277	1004	.023	.07960	.0110	.1482

Source: Author's own development (2022).

Moreover, this research carried out Independent Sample T-test and found no significant difference between women and men in their intention to use e-government, as P value = $0.496 > \alpha = 0.05$ (case of equality of variances assumed, as F coefficient of Leven's test has P value = $0.105 > \alpha = 0.05$) Appendix III.

Furthermore, 24.3% of the youngest studied generation (18- 30) have the highest intention to use e-government services, as the new generation is well-adapted to online services and feels the comfort to deal with the virtual environment, as it is the tool of their era, (31- 49) age group have the second-ranked intentions with 12.9%, whereas only 7.5% of (50- 65) age group intend to use e-government services if they have an alternative way to fulfill these services rather than e-government, see Table 28.

Table 28. Intention to use Syrian e-government Age distribution.

Age group	Nr of respondents	Percentage of the sample	Have Intention to use e-government%	Have neutral intention	Don't intend to use e-government
18- 30	333	33.2%	%24.3 (81 respondents)	41.15% (137 respondent)	34.55% (115 respondents)
31- 49	551	54.8%	12.9% (71 respondents)	16.5% (91 respondent)	70.6% (389 respondent)
50- 65	121	9.16%	7.5% (9 respondents)	27.3% (33 respondent)	65.2% (79 respondent)
Total	1005	100%	16% (161 respondent)	26% (261 respondents)	58% (583 respondent)

Source: Author's own development (2022).

As described earlier in this research in Figure 9, this study distinguishes between the younger generation 18- 50 (88% from the whole sample, 884 respondents) and the older generation 50- 65 (12% from the whole sample, 121 respondents), this enables to see the effect of age on intention, as the mean intention of the younger generation (2.95) is bigger than that of the older generation (2.54), depending on this, we can conclude that the older generation has a much negative intention to use e-government than the younger generation, also, those results show that even the younger generation's intention to use e-government is negative (under 50 years old), the mean of their answer is very close to the middle of the scale and almost neutral, which leads us to advise the Syrian government to concentrate its efforts on the younger generations under 50 years to change their intention toward using e-government to the positive side, here, this research encourages Syrian government to take benefit of factors affecting Syrian e-government, discussions, and results presented in this research to find practical ways to overcome the weaknesses that drawback citizens' intentions from using e-government, also, the government has to identify the factors that encourage under 50 years old people to use Syrian e-government portals.

An Independent-sample T-test was conducted to test if the two age groups' intentions to use e-government significantly differs, the results in Appendix III confirm the significant deference, as P value = $0.000 < \alpha = 0.05$ (case of equality of variances not assumed, as the F coefficient of Leven's test has P value = $0.001 < \alpha = 0.05$).

10.2.15 Citizens' Attitude toward e-government

All signals this research collected during the fieldwork through in-depth interviews, focus groups, and discussions with experts give the impression that Syrians have a negative attitude toward e-government, also the statistical analysis of data collected through the survey confirms this impression, as the mean answer of citizens' overall Attitude toward e-government is 2.75, which is significantly below 3 (the middle of the scale), as one-Sample T-test P-value = 0.000 < α = 0.05, Table 29.

Further analysis in this regard of the mean answers of the items composing the Attitude scale shows that people see e-government as an appealing concept and socially like to be looked at as “one of those” who use e-government with mean answers 3.4, 3.5 in sequence, the people answer about “You find it a good idea to use e-government to fulfill your needs.” has a negative direction with a mean answer of 1.8, and have a bad impression of Syrian e-services, as citizens highly prefer the traditional ways with a mean answer of 4.15 (reversed coded question), whereas the mean answer of the question “Your attitude toward e-services is negative because e-services will replace traditional work, and many employees will become jobless.” reached only 2.8 (reversed coded question), the latter reveals that Syrian citizens haven't the tendency to concerns about losing jobs due the reduction of traditional jobs caused by the technology advancement provided by e-government, or at least they don't care due to the very low employment wages.

Here, this study advises government to take advantage of the positive perception towards the e-government concept and the positive social impression of persons dealing with e-government to quickly enhance its services while people still have this positive impression, if it is lost, the government needs prolonged efforts to change the negative image of the Syrian government.

Table 29. One-Sample Test for testing Syrian citizens' Attitude toward e-government.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Overall Attitude	1005	2.7463	1.04686	.03302

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall Attitude	7.684	1004	.000	.25373	.1889	.3185

Source: Author's own development (2022).

10.2.16 Citizens' Adoption of e-government

At this stage, the research reaches the important test of Syrian citizens' Adoption of e-government, as many studies confirmed that citizens' adoption is a principal factor in successful and sustainable e-government projects (Kumar et al. 2007; Singh et al. 2019; Mensah et al. 2020).

The statistical analysis shows that most Syrian citizens do not tend to adopt e-government as 76% of respondents' mean answers of overall Adoption were below 3 (the middle of the scale).

The mean answer assessing respondents' overall e-government adoption is 2.2 and significantly differs from 3 (the middle of the scale) depending on the results of the One-Sample T-test, Table 30.

More analysis of the items assessing Adoption shows that the mean answer of the item "Even if you have other choices, you use e-government to fulfill your needs available via e-government services." was the extremist negative answer between items assessing citizens' adoption with 1.8 which means that most of the Syrian citizens have a negative opinion with e-government drive them to prefer the other channels to fulfill their needs when they have the choice.

Table 30. One-Sample Test for testing Syrian citizens' Adoption of e-government.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Overall Citizens' Adoption of e-government	1005	2.2139	.82841	.02613

One-Sample Test						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall Citizens' Adoption of e-government	30.082	1004	.000	.78607	-.7348	.8373

Source: Author's own development (2022).

10.2.17 Digital Divide

Remembering that this research to assess the Digital Divide existence and extent in the Syrian case study, distributed an individual questionnaire to the experts and insiders in e-government and ICTs affairs in Syria as explained in Methodology and quantitative research, paragraphs 6.2 and 9.21.2, also this study distributed and discussed 34 surveys with the pre-contacted list of mentioned experts and insiders¹⁰.

The mean answer of the overall Digital Divide reaches 3.7¹¹, expressing a clear digital divide in Syrian society as it significantly exceeds 3 (the middle of the scale) depending on One Sample T-test results shown in Table 31.

Table 31. One-Sample Test for testing Digital Divide in Syrian context.

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
Overall Digital Divide	34	3.6765	1.22402	.20992

One-Sample Test						
Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall Digital Divide	3.223	33	.003	.67647	.2494	1.1036

Source: Author's own development (2022).

Getting in more detail with the items forms the Digital Divide scale Table 32., we can see that the mean answer of the item measuring if Syrian people have enough knowledge to deal with e-government reaches 3.3, which is very close to the result reached in the first survey answered by the public.

Also, the experts responded negatively to the question “Government/ NGOs provide enough adequate ICT courses for users.” with a mean answer of 2.8. Moreover, when the latter result was discussed with experts while providing them with feedback on the results of this study, they expressed that the Syrian government had planned ambitious adequate ICT courses during the years preceding the Syrian conflict. Unfortunately, during the years of war, those efforts declined for many reasons, whereas the role of NGOs in this regard has been but a few attempts of little or no practical value. In the same context, those courses are not accessible for all with a mean answer to the question measuring this aspect of 2.3, generally, the courses took place in major cities for security reasons.

¹⁰ After collecting the filled surveys, the researcher shortly interviewed experts and insiders for providing feedback and discussing the results.

¹¹ Reader should pay attention that the questionnaire of the Digital Divide contains reversed coded questions, see Table 27.

In this regard, the investigated experts expressed that NGOs may be more able to take the lead in spreading ICT knowledge than the official institutions under the current conflict conditions, hence, the research recommends the government give wide support to NGOs initiatives and provide them with all the possibilities and facilities to start ICT courses on the national base, as the NGOs flexible structure, agility, and international/ regional relations are relatively more suitable for work under conflicts.

From another point of view, e-government portals and initiatives don't provide solutions for people with special needs to engage in the e-government process with a mean answer of 1 which expresses that all experts (respondents) found no solution provided by the e-government system for people with special need to interact through its website.

Also, the ICT infrastructure for ICT courses in public schools is not sufficient with a mean answer of 2.7, this low governmental support for education in providing ICT courses is related, on one side, to the severe reduction in qualified IT trainers (who, during long years of war left out the country), and to the high cost of essential infrastructure to equip all schools with ICT equipment on the other side, besides to the repetitive destruction and stealing of ICT equipment from schools in conflict areas and even in relatively stable areas, this difficult situation in such an important and strategic sector as education needs inventive solutions, such as mobile (roving) centers reaching schools in each area in sequence, providing intensive short courses held by specialists who got sufficient wages, as an example.

This research cannot suggest any solution in this regard because it needs a deep analysis from educational insider experts familiar with the educational sector on the ground, in the same context, respondents declared that no distinguished website gives information about national ICT courses with a mean answer of 1.8 but just some separate mentions on several websites.

Another item of the Digital Divide scale reveals that workplaces haven't sufficient resources (such as PC, Mobile, sufficient internet speed, etc.) to enable employees to participate in e-government services with a mean answer of 2.1, whereas, the extremist possible negative mean answer of 1 shows consensus among the respondents that e-government project doesn't provide any public places with sufficient infrastructure allocated for public to participate in e-government services or at least public places for interacting online.

Moreover, an important side hasn't been discussed thoroughly in the Syrian context, that is the absence of the local native language of some minority groups rather than the official language (Arabic) on the e-government website may hinders them from interacting independently with e-government with a mean answer of 3.1 (the question is reversed coded, see Table 32), here, upgrading systems to provide multi-languages option containing languages spoken by some Syrian citizens as native languages besides Arabic, such as Aramaic, Arminian, Assyrian, Kurdish, Turkish, and Syriac allows widening e-government spread among more citizens, enhancing chances to be adopted by Syrians, and leaving no one behind.

In another context, the answer of respondents (experts) about if citizens have the means to do their transactions online (credit card, online paying methods...), with a mean answer of 2.2, denoted that most Syrian citizens cannot accomplish or complete their tasks online via e-government services because they have not any online payment means, this result sheds light on a great obstacle may cause

Syrian e-government projects to fail, that the government is unable to provide adequate infrastructure for financial transactions.

For more benefit, this research discussed the results with insiders who confirmed the scarcity of such infrastructure (such as credit cards, stable network with a proper internet speed, and properly updated software for accomplishing e-payments) because of sanctions exerted on Syria relating to the current conflict, besides, most citizens don't have a bank account, or have a bank account that doesn't support online payment. To overcome this problem due to insiders, the government has to find a way to convince more people to have a bank account, especially among the new generation, facilitate it, and offer incentives for that, besides to develop the systems all public banks to get along with online banking methods and building a national network for online transaction engaging public and private banks.

In line with the fact that the majority of items measuring the Digital Divide are negative, another opinion presented by respondents (experts) has a mean answer of 2.9 about if citizens have sufficient private resources to participate in e-government services (PC, Mobile, sufficient internet speed), this opinion is very close to 3 (the middle of the scale) and almost neutral, which gives a perception that about half of Syrians don't have proper tools to interact via e-government portal, keeping in mind the result mentioned previously that e-government initiatives don't afford places equipped with ICT equipment for the public to interact with e-government, drive us to conclude that more than half of Syrian people cannot participate in e-government even if they have the knowledge and ability, here, this study encourages e-government initiatives to plan to establish public places allocated only for interacting with e-government if it wants to be widely adopted by citizens, those public places or centers may establish with the cooperation of NGOs as discussed earlier in this paragraph.

Furthermore, the Digital Divide survey's results denoted that adequate internet fees are not costly but also not cheap, as the mean answer to the question "An adequate internet speed connection fee to use e-government services has a high cost"; (reversed coded question) stands near the middle of the scale with 3.1, and the government has to find solutions to support internet fees to enable more people engaging e-process.

Finally, discussing the extremist negative results of some items (with a mean answer of 1) declares the absolute unavailability of some important aspects that help to bridge the Digital Divide, those aspects are "the means which enable people with special needs from interacting e-government and availability of ICTs-equipped public places (governmental offices or spaces) to enable people who can't afford ICTs necessary to use e-government", in sequence, the absence of mentioned aspects widen the Digital Divide, hamper initiating successful e-government, and result in less adoption by people, also, readers should pay attention that, according to this survey, most vulnerable people were not taken into respect during the building-up of e-government systems, as the local language of some minorities is not supported besides the people with certain special needs haven't the tools to involve with e-government, this research recommends upgrading available systems to have a multilanguage interface provides local language and international languages (international languages interface enables Syrians from the second and third generation who born and lived abroad and still have connections and interests in the home territory).

Table 32. Respondents' answers to items forming Syrian Digital Divide scale.

Digital Divide			
Item Code	Item	Coding	Mean answer
DD1	Generally, citizens have enough knowledge to use ICT by themselves, and thus they can perform their needed tasks online.	Normal coding	3.3
DD2	Government/ NGOs provides enough adequate ICT courses for users.	Normal coding	2.8
DD3	The ICT courses provided by the government/ NGOs are accessible to all.	Normal coding	2.3
DD4	There are solutions for users with special needs to use e-government, such as voice illustrator, voice respondent, accessibility option for better vision, etc.	Normal coding	1
DD5	There is sufficient ICT infrastructure for ICT courses in public schools.	Normal coding	2.7
DD6	There is well known specific website that gives information about national ICT courses.	Normal coding	1.8
DD7	Generally, citizens have sufficient resources to participate in e-government services (PC, Mobile, sufficient internet speed, online paying methods....)	Normal coding	2.9
DD8	Generally, workplaces have sufficient resources to participate in e-government services (PC, Mobile, sufficient internet speed...).	Normal coding	2.1
DD9	In your opinion, an adequate internet speed connection fee to use e-government services has a high cost (reversed coded).	Reversed coding	3.1
DD10	Generally, citizens have the means to do their transactions online (credit card, online paying methods...).	Normal coding	2.2
DD11	Governmental offices provide sufficient places with sufficient infrastructure to participate in e-government services.	Normal coding	1
DD12	If the mother language of some minority groups is not available on e-government platforms, they can't use those platforms without help (reversed coded). "Some Syrian citizens speak these local languages as native languages, such as Aramaic, Armenian, Assyrian, Kurdish, Turkish, and Syriac".	Reversed coding	3.1
Overall digital divide DD ¹²			3.675

Source: Author's own development (2022).

¹² Note that the Digital divide mean reversed in direction of the calculated arithmetic mean of DD items, as the Digital Divide holds a negative meaning opposite the meaning of questions (Except DD9 and DD11), for example, the less citizens' s ICT Knowledge the Higher Digital Divide.

10.3 Testing Hypotheses

10.3.1 Methods used to assess relations between variables and e-government

As many studies confirmed that citizens' adoption is an important indicator of successful and sustainable e-government projects (Kumar et al, 2007; Singh et al. 2019; Mensah et al. 2020), this study considers any factor significantly correlates with adoption as an affecting factor on e-government implementation. The study used the correlation test for that purpose.

But there are two exceptions for the factors "Intention" and "Digital Divide", and thus to assess the effect of citizens' Intention to use e-government and the Digital Divide, this study will not use the correlation between them and Adoption, as the Adoption scale developed by this research highly depends on the Intention scale as described in paragraph 8.2.1.17, where Carter and Belanger (2005) and Carter and Weerakkody (2008) used intention to use e-government as an indicator of e-government adoption also Gefen and Straub (2000) used intention of inquiring and purchasing to assess Adoption, and many other studies in literature do the same.

On the other hand, the Digital Divide data were collected by an independent survey different from the survey used for Adoption, with a different targeted population.

Instead, to decide the existence of an effect of the Digital Divide in the Syrian context and the citizen's Intention effect on the Syrian e-government, this research used One Sample T-test to investigate if the mean answer of each of the two variables significantly differs from the middle of the scale, simultaneously with investigating the opinions of experts and insiders in Syrian context to confirm or reject the existence of this effect and considered Digital Divide and Intention as affecting factors on Syrian e-government.

Also, this research in evaluating correlations between variables depends on the absolute value of r to assess the strength of the relation between variables regarding Evans (1996) guide suggestions:

The relation is considered very weak when absolute r is between 0- 0.19.

The relation is considered weak when absolute r is between 0.2- 0.39.

The relation is considered moderate when absolute r is between 0.4- 0.59.

The relation is considered strong when absolute r is between 0.6- 0.79.

The relation is considered very strong when absolute r is between 0.8- 1.

10.3.2 The relation between Citizens' Personal Security Feelings and Adoption of Syrian e-government

To find out the relation between Citizens' Personal Security Feelings and Adoption of Syrian e-government, this study will investigate the relation between of each component of Personal Security Feelings theme (Trust, Risk, Security, Privacy, Uncertainty) with Adoption as follows.

10.3.2.1 The relation between Perceived Trust and Adoption of e-government

From correlation test results shown in Table 33, we can see a significant strong positive relation between Citizens' Perceived Trust and Adoption of e-government as P- value = 0.000 < α = 0.05 and r = 0.625 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Perceived Trust on Citizens' Adoption of e-government.

In other words, this result confirms Perceived Trust as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis H1.1 of this research is accepted.

✓ **H1.1- Perceived Trust is an affecting factor of e-government implementation in Syria (accepted).**

Table 33. Correlation test between Overall Perceived Trust and Adoption of e-government.

		Correlations	
		Overall Adoption	Overall Perceived Trust
Overall Perceived Trust	Pearson Correlation	.625**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.2.2 The relation between Perceived Risk and Adoption of e-government

From the correlation test results shown in Table 34, we can see a significant strong positive relation between Citizens' Perceived Risk and Adoption of e-government as P- value = 0.000 < α = 0.05 and r = 0.622 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Perceived Risk on Citizens' Adoption of e-government.

In other words, this result confirms Perceived Trust as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis H1.2 of this research is accepted.

✓ **H1.2- Perceived Risk is an affecting factor of e-government implementation in Syria (accepted).**

Table 34. Correlation test between Overall Perceived Risk and Adoption of e-government.

Correlations

		Overall Adoption	Overall Perceived Risk
Overall Perceived Risk	Pearson Correlation	.622**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.2.3 The relation between Perceived Security and Adoption of e-government

From correlation test results shown in Table 35, we can see a significant moderate positive relation between Citizens' Perceived Security and Adoption of e-government as P- value = 0.000 < α = 0.05 and r = 0.580 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Perceived Security on Citizens' Adoption of e-government.

In other words, this result confirms Perceived Security as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis H1.4 of this research accepted.

✓ **H1.3- Perceived Security is an affecting factor of e-government implementation in Syria (accepted).**

Table 35. Correlation test between Overall Perceived Security and Adoption of e-government.

Correlations

		Overall Adoption	Overall Perceived Security
Overall Perceived Security	Pearson Correlation	.580**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.2.4 The relation between Perceived Privacy and Adoption of e-government

From the correlation test results shown in Table 36, we can see a significant moderate positive relation between Citizens' Perceived Privacy and Adoption of e-government as $P\text{-value} = 0.000 < \alpha = 0.05$ and $r = 0.522$ regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Perceived Privacy on Citizens' Adoption of e-government.

In other words, this result confirms Perceived Privacy as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis H1.4 of this research is accepted.

✓ **H1.4- Perceived Privacy is an affecting factor of e-government implementation in Syria (accepted).**

Table 36. Correlation test between Overall Perceived Privacy and Adoption of e-government.
Correlations

		Overall Adoption	Overall Perceived Privacy
Overall Perceived Privacy	Pearson Correlation	.522**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.2.5 Relation between Perceived Uncertainty and Adoption of e-government

From the correlation test results shown in Table 37, we can see a significant strong negative relation between Citizens' Perceived Uncertainty dealing with e-government and their Adoption as $P\text{-value} = 0.000 < \alpha = 0.05$ and $r = 0.629$ regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Citizens' Perceived Uncertainty dealing with e-government on Adoption of e-government.

In other words, this result confirms Citizens' Perceived Uncertainty dealing with e-government as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis H1.1 of this research.

✓ **H1.5- Perceived Uncertainty is an affecting factor of e-government implementation in Syria (accepted).**

Table 37. Correlation test between Overall Uncertainty and Adoption of e-government.
Correlations

		Overall Adoption	Overall Perceived Uncertainty
Overall Perceived Uncertainty	Pearson Correlation	.629**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

By the end of this paragraph 10.3.2, this research proved statistically that each component of Personal Security Feelings theme (Trust, Risk, Security, Privacy, Uncertainty) have a significant impact on Syrian e- government implementation and these results lead the study to accept the first Hypothesis of this research, H1.

H1- Citizens' Personal Security Feelings affect e-government implementation in Syria (accepted).

10.3.3 The relation between Citizens' Personal Knowledge and Adoption of Syrian e-government

To find out the relation between Citizens' Personal Knowledge and Adoption of Syrian e-government, this study will investigate the relation between of each component of Personal Knowledge theme (Awareness, ICT knowledge, Ability to use ICT, Education level) with Adoption as follows.

10.3.3.1 The relation between Perceived Awareness and Adoption of e-government

From the correlation test results shown in Table 38, we can see a significant moderate positive relation between Citizens' Perceived Awareness and Adoption of e-government as P- value = 0.000 < α = 0.05 and r = 0.4 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the research to declare that:

There is a significant impact of Perceived Awareness on Citizens' Adoption of e-government.

In other words, this result confirms Perceived Awareness as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis H2.1 of this research is accepted.

✓ **H2.1- : Perceived Awareness is an affecting factor of e-government implementation in Syria (accepted).**

Table 38. Correlation test between Overall Perceived Awareness and Adoption of e-government.

Correlations		Overall Adoption
Overall Perceived	Pearson Correlation	.400**
Awareness	Sig. (2-tailed)	.000
	N	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.3.2 The relation between ICT Knowledge and Adoption of e-government

From the correlation test results shown in Table 39, we can see a significant strong positive relation between Citizens' ICT Knowledge and their Adoption as P- value = 0.000 < α = 0.05 and r = 0.669 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Citizens' ICT Knowledge on Adoption of e-government.

In other words, this result confirms Citizens' ICT Knowledge as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis H2.2 of this research.

✓ **H2.2- ICT Knowledge is an affecting factor of e-government implementation in Syria (accepted).**

Table 39. Correlation test between Overall ICT Knowledge and Adoption of e-government.
Correlations

		Overall Adoption	Overall ICT Knowledge
Overall ICT Knowledge	Pearson Correlation	.669**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.3.3 The relation between Perceived ICT Ability to use ICT and Adoption of e-government

From the correlation test results shown in Table 40, we can see a significant moderate positive relation between Citizens' Perceived Ability to use ICT for interacting online and Adoption of e-government as $P\text{-value} = 0.000 < \alpha = 0.05$ and $r = 0.528$ regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Perceived Ability to use ICT for interacting online on Citizens' Adoption of e-government.

In other words, this result confirms Perceived Ability to use ICT for interacting online as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis H2.3 of this research.

✓ **H2.3- Perceived Ability to use ICT is an affecting factor of e-government implementation in Syria (accepted).**

Table 40. Correlation test between Overall Perceived ICT Ability to use ICT and Adoption of e-government.
Correlations

		Overall Adoption of e-government	Overall Perceived Ability to use ICT
Overall Perceived Ability to use ICT	Pearson Correlation	.528**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.3.4 The Impact of Education Level on Citizens' Adoption of e-government

Similar to the result of the impact of Perceived Compatibility (personal compatibility) on Citizens' Adoption of Syrian e-government, this research finds no meaningful relation between Syrian Citizen's education level and their Adoption of national e-government as the result of the correlation test revealed; P- value = 0.051 > $\alpha = 0.05$ (Correlation test used Kendall's tau-b (τ_b) correlation coefficient as education level is an ordinal variable), Table 41.

This result leads the study to declare that:

There is no significant impact of education level on Citizens' Adoption of Syrian e-government.

In other words, this result rejects education level to be an affecting factor on Syrian e-government implementation, and thus the sub-Hypothesis H2.4 of this research is rejected.

✘ H2.4- Education Level is an affecting factor of e-government implementation in Syria. (rejected).

Table 41. Correlation test between Education Level and Adoption of e-government Correlations

		Overall Citizens' Adoption of e-government	Education Level
Kendall's tau_b	Education Level	.051	1.000
	Correlation Coefficient		
	Sig. (2-tailed)	.061	.
	N	1005	1005

Source: Author's own development (2022).

By the end of this paragraph 10.3.3, this research proved statistically that three component of Personal Knowledge theme (Awareness, ICT knowledge, Ability to use ICT) have a significant impact on Syrian e- government implementation and one component (Education Laval) have no significant impact on it, these results lead the study to accept partially the second Hypothesis of this research, H2.

H2- Citizens' Personal Knowledge partially affects e-government implementation in Syria (Partially accepted).

10.3.4 The relation between Citizens’ Personal Assessment of the Syrian e-government and Adoption

To find out the relation between Citizens’ Personal Assessment of the Syrian e-government and Adoption, this study will investigate the relation between of each component of Personal Assessment theme (Service Quality, Satisfaction, Compatibility, Usefulness/Benefit) with Adoption as follows.

10.3.4.1 Relation between Perceived Service Quality and Adoption of e-government

From the correlation test results shown in Table 42, we can see a significant weak positive relation between Citizens’ perceived service quality and adoption of e-government as P- value = 0.000 < α = 0.05 and r = 0.288 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Perceived Service Quality on Citizens’ Adoption of e-government.

In other words, this result confirms Perceived Service Quality as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis H3.1 of this research is accepted.

✓ **H3.1- Perceived Service Quality is an affecting factor of e-government implementation in Syria (accepted).**

Table 42. Correlation test between Overall Perceived Service Quality and Adoption of e-government.

Correlations		Overall Adoption
PESQ. Overall	Pearson Correlation	.288**
	Sig. (2-tailed)	.000
	N	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author’s own development (2022).

10.3.4.2 Relation between Citizens’ Satisfaction and Adoption of e-government

From correlation test results shown in Table 43, we can see a significant moderate positive relation between Citizens’ Satisfaction with e-government and Adoption of e-government as P- value = 0.000 < α = 0.05 and r = 0.407 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Citizens’ Satisfaction with e-government on their Adoption of e-government.

In other words, this result confirms Citizens’ Satisfaction as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis 3.2 of this research is accepted.

✓ **H3.2- Citizens’ Satisfaction is an affecting factor of e-government implementation in Syria (accepted).**

Table 43. Correlation test between Overall Citizens' Satisfaction and Adoption of e-government.
Correlations

		Overall Adoption	Overall E-government Satisfaction
Overall E-government Satisfaction	Pearson Correlation	.407**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.4.3 Relation between Perceived Compatibility (personal compatibility) of e-government systems and Adoption of e-government

From the correlation test results shown in Table 44, we can see a non-significant relation between Perceived Compatibility (personal compatibility) of e-government systems and Citizens' Adoption of Syrian e-government as $P\text{-value} = 0.422 > \alpha = 0.05$.

This result leads the study to declare that:

There is no significant impact of Perceived Compatibility (personal compatibility) of e-government systems on Syrian Citizens' Adoption of e-government.

In other words, this result rejects Perceived Compatibility (personal compatibility) of e-government systems to be an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis 3.3 of this research is rejected.

✘ H3.3- Perceived Compatibility (personal compatibility) is an affecting factor of e-government implementation in Syria (rejected).

Table 44. Correlation test between Overall Perceived Compatibility (personal compatibility) and Adoption of e-government.

		Overall Citizens' Adoption of e-government	Perceived Compatibility
Perceived Compatibility	Pearson Correlation	.025	1
	Sig. (2-tailed)	.422	
	N	1005	1005

Source: Author's own development (2022).

10.3.4.4 Relation between Perceived Usefulness/ Benefit and Adoption of Syrian e-government

From the correlation test results shown in Table 45, we can see a significant moderate to strong positive relation between Citizens' Perceived Usefulness of dealing with e-government and their Adoption as P- value = 0.000 < α = 0.05 and r = 0.593 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Citizens' Perceived Usefulness of dealing with e-government on Adoption of e-government.

In other words, this result confirms Citizens' Perceived Usefulness/ Benefit of dealing with e-government as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis 3.4 of this research is accepted.

✓ **H3.4- Perceived Usefulness/ Benefit is an affecting factor of e-government implementation in Syria (accepted).**

Table 45. Correlation test between Overall Perceived Usefulness/ Benefit and Adoption of e-government

		Correlations	
		Overall Adoption	Overall Perceived Usefulness
Overall Perceived Usefulness	Pearson Correlation	.593**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

By the end of this paragraph 10.3.4, this research proved statistically that three component of Personal Knowledge theme (Service Quality, Satisfaction, Usefulness/Benefit) have a significant impact on Syrian e- government implementation and one component (Compatibility) have no significant impact on it, these results lead the study to accept partially the third Hypothesis of this research, H3.

H3- Citizens' Personal Assessment of Syrian e-government affects its implementation (Partially accepted).

10.3.5 Relation between Perceived Image of using e-government and Citizens' Adoption of e-government

From the correlation test results shown in Table 46, we can see a significant strong positive relation between Perceived Image of using e-government and Citizens' Adoption as P- value = 0.000 < α = 0.05 and r = 0.629 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Perceived Image of using e-government on Citizens' Adoption of e-government.

In other words, this result confirms Perceived Image of using e-government as an affecting factor of Syrian e-government implementation, and thus the fourth Hypothesis H4 of this research is accepted.

✓ **H4- Perceived Image of using e-government an affecting factor of e-government implementation in Syria (accepted).**

Table 46. Correlation test between Perceived Image of using e-government and Adoption of e-government.

		Correlations	
		Overall Adoption	Perceived Image of using e-government
Perceived Image of using e-government	Pearson Correlation	.629**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.6 Assessing the effect of Syrians' Personal Response on e-government implementation in Syria

To assess the impact of Citizens' Personal Response toward Syrian e-government on e-government implementation in Syria, this study will investigate the effect of each component of Personal Response theme (Attitude, Intention) on Syrian e-government case as follows.

10.3.6.1 Relation between Syrian citizens' Attitude toward e-government and their Adoption of e-government

From the correlation test results shown in Table 47, we can see a significant moderate positive relation between Syrian citizens' Attitude toward e-government and their Adoption of e-government as P- value = 0.000 < α = 0.05 and r = 0.442 regarding Evans (1996) guide suggestions of the relation strength.

This result leads the study to declare that:

There is a significant impact of Syrian citizens' Attitude toward e-government on Adoption of e-government.

In other words, this result confirms citizens' Attitude toward e-government as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis 5.1 of this research is accepted.

✓ **H5.1- Citizens' Attitude is an affecting factor of e-government implementation in Syria (accepted).**

Table 47. Correlation test between Syrian citizens' Attitude and Adoption of e-government.

		Overall Adoption	Overall Attitude
Overall Attitude	Pearson Correlation	.442**	1
	Sig. (2-tailed)	.000	
	N	1005	1005

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Author's own development (2022).

10.3.6.2 The effect of Syrian citizens' intention to use e-government on e-government implementation

Since the Adoption scale used in this study depends on intention toward using e-government as citizens' adoption is considered by the majority of studies as a vital signal of e-government success (Zheng et al., 2013; Gilbert et al., 2004; Warkentin et al., 2002), this research considers it is not valuable to assess the relation between Intention and Adoption.

To confirm that Intention is an affecting factor on e-government implementation in the Syrian case, this study decided to assess the existence of the Intention effect on Syrian e-government implementation on the experts and insiders in the Syrian context who confirmed the existence of this effect and considered Intention as an essential drive for citizens to adopt e-government and make its initiatives succeed, which goes in line with all studies this research found in the literature about intention importance in the successful experience of e-government or e-services projects in general, as discussed previously in literature review paragraph, besides considering the result of paragraph 10.2.14 that showed the mean answer of citizens' Intention is significantly differs from the middle of the scale, Table 27.

This result leads the study to declare that:

There is a significant impact of Syrian citizens' intention to use e-government on e-government implementation.

In other words, this result confirms citizens' intention to use e-government as an affecting factor of Syrian e-government implementation, and thus the sub-Hypothesis 5.2 of this research is accepted.

✓ **H5.2- Citizens' Intention to use e- government is an affecting factor of e-government implementation in Syria (accepted).**

By the end of this paragraph 10.3.6, this research proved statistically that each component of Personal response toward e-government theme (Attitude, Intention) have a significant impact on Syrian e-government implementation and these results lead the study to accept the fifth Hypothesis of this research, H5.

✓ **H5- Syrians' Personal Response toward e-government affects e-government implementation in Syria.**

10.3.7 The effect of the Digital Divide on Syrian e-government implementation

As this research to assess the Digital Divide in Syria used an independent survey assigned to experts and insiders in Syrian digital affairs and used another survey in assessing citizen Adoption of e-government assigned to the Syrian public (another sample), it is unsound to assess the relation between those two variables, instead of that, this study decided to assess the existence of Digital Divide effect on Syrian e-government implementation depending on the mean answer of the overall Digital Divide calculated from the collected data of the second survey.

The mean answer of the overall Digital Divide reaches 3.7, which significantly surpasses (3 the middle of the scale) according to the results of One Sample T-test, as P- value = 0.003 < α = 0.05, Table 31, paragraph 10.2.17.

This result expresses a clear digital gap between Syrian citizens and confirms Digital Divide as an affecting factor on e-government implementation in the Syrian case.

This result leads the study to declare that:

There is a significant impact of Digital Divide government on e-government implementation.

In other words, this result confirms Digital Divide as an affecting factor of Syrian e-government implementation, and thus the sixth Hypothesis H6 of this research is accepted.

✓ **H6- The Digital Divide is an affecting factor of e-government implementation in Syria.**

Finally, this study accepted fifteenth hypotheses out of seventeen the research proposed and reject two, the following Table 48, summarize the confirmed Hypotheses.

Table 48. Hypotheses testing results.

	Hypothesis Nr.	Description	Result
H1	H1	Citizens' Personal Security Feelings affect e-government implementation in Syria.	Accepted
	H1.1	Perceived Trust is an affecting factor of e-government implementation in Syria.	Accepted
	H1.2	Perceived Risk is an affecting factor of e-government implementation in Syria.	Accepted
	H1.3	Perceived Security is an affecting factor of e-government implementation in Syria.	Accepted
	H1.4	Perceived Privacy is an affecting factor of e-government implementation in Syria.	Accepted
	H1.5	Perceived Uncertainty is an affecting factor of e-government implementation in Syria	Accepted

	Hypothesis Nr.	Description	Result
H2	H2	Citizens' Personal Knowledge affects e-government implementation in Syria.	Partially accepted
	H2.1	Perceived Awareness is an affecting factor of e-government implementation in Syria.	Accepted
	H2.2	ICT Knowledge is an affecting factor of e-government implementation in Syria.	Accepted
	H2.3	Perceived ICT Ability is an affecting factor of e-government implementation in Syria.	Accepted
	H2.4	<i>Perceived Compatibility (personal compatibility) is an affecting factor of e-government implementation in Syria.</i>	<i>Rejected</i>
H3	H3	Citizens' Personal Assessment of Syrian e-government affects its implementation.	Partially accepted
	H3.1	Perceived Service Quality is an affecting factor of e-government implementation in Syria.	Accepted
	H3.2	Citizens' Satisfaction is an affecting factor of e-government implementation in Syria.	Accepted
	H3.3	<i>Education Level is an affecting factor of e-government implementation in Syria.</i>	<i>Rejected</i>
	H3.4	Perceived Usefulness/ Benefit is an affecting factor of e-government implementation in Syria.	Accepted
H4	H4	Perceived Image of using e-government an affecting factor of e-government implementation in Syria.	Accepted
H5	H5	Syrians' Personal Response toward e-government affects e-government implementation in Syria.	Accepted
	H5.1	Citizens' Attitude is an affecting factor of e-government implementation in Syria.	Accepted
	H5.2	Citizens' Intention to use e-government is an affecting factor of e-government implementation in Syria.	Accepted
H6	H6	Digital Divide is an affecting factor of e-government implementation in Syria.	Accepted

Source: Author's own development (2023).

10.3.8 Summary of the result of testing the Hypotheses of the research

By the end of this chapter 10.3 (Testing hypotheses), the study proved that most of the Social factors (15 factors out of 17) have a significant impact on the Syrian e-government, while only two factors have no significant impact on it.

The strength and direction of the relations between the Social factors and e-government implementation are described in Table 49.

Table 49. relations between social factors and Syrian e-government implementation

Factor	Relation with e-government implementation
Perceived Awareness	Moderate positive relation
Perceived Service Quality	Weak positive relation
Perceived Trust	Strong positive relation
Perceived Risk	Strong positive relation
Perceived Security	Moderate positive relation
Perceived Privacy	Moderate positive relation
Satisfaction	Moderate positive relation
Perceived Uncertainty	Strong negative relation
Perceived Compatibility (personal compatibility)	Non-significant relation
Perceived Usefulness/ Benefit	Moderate to strong positive relation
ICT Knowledge	Strong positive relation
Perceived ICT Ability	Moderate positive relation
Education Level	Non-significant relation
Perceived Image of using e-government	Strong positive relation
Attitude	Moderate positive relation
Intention	The relation confirmed, the strength not assessed statistically.
Digital Divide	The relation confirmed, the strength not assessed statistically.

Source: Author's own development (2023).

Finally, Figure 10 illustrates the proven influential Social factors on the Syrian e-government.



Figure 10. Social affecting factors on Syrian e-government implementation
 Source: Author's own development (2023).

11. CONCLUSIONS AND RECOMMENDATIONS

Even though there are Social factors considered important in affecting e-government implementation in many case studies, these factors may have less importance or no importance in other cases, especially in regards to comparing developed and developing countries, as many different conditions and circumstances may boost or hinder an impact of some factors, such as poverty, political and security environment and so on.

This research confirmed 15 Social factors that affect the Syrian e-government as an example of developing countries with a collapsed economy suffering from continued 12 years of armed conflict and rejected two factors that were important in more developed countries with stable economic and political situations; the Education level and electronic systems Compatibility with the personality of e-government users, the two factors have lost their importance or hindered by surrounding circumstances to affect the national e-government.

Depending on the previous discussions about the differentiation of actual factors that influence e-government between countries, besides the declaration of Alassaf et al. (2020) that in developing countries, high economic development is not a pre-condition to a successful implementation of e-government, this study finds it is important to deal with every national e-government as an individual case and test each factor affecting its success individually taking advantage of the previous studies and tools, such as the FCCT model with its correlated tables proposed by this research.

Moreover, Syrian e-government initiatives have many disadvantages and some advantages. To overcome the shortcomings and benefit from the positive sides, this study in the following lines presents the strengths and weaknesses, proposes suggestions, and sends recommendations to the Syrian government.

In the beginning, this study concluded that even though Syrian people have enough ICT knowledge, they are not familiar with dealing with the services provided by the Syrian e-government, as there is a clear weakness in training to explain possibilities and in raising citizens' awareness of the national e-government. In this context, this research recommends the government to start national training campaigns to increase citizens' self-ability to use ICTs for interacting with e-government independently, especially for the older generation. In this regard, the research recommends the government give wide support to NGOs initiatives and provide them with all the possibilities and facilities to start ICT courses on the national base, as their flexible structure, agility, and international/regional relations are relatively more suitable for work under conflicts. Also, it is important to train staff to boost support and feedback to the users, as the national e-government is still new for most Syrians, and they need help to proceed with these services in the first period of use.

Furthermore, this study concluded that more than half of the Syrians are not able to participate in e-government even if they own the knowledge and ability because they cannot afford the necessary adequate ICT devices, here, this study encourages e-government initiatives to establish public places allocated for interacting with e-government to increase its adoption among citizens. Those public places or centers may be established with the cooperation of NGOs. From another point of view, the government has to find solutions to support internet costs to enable more people engaging e-process, such as reducing taxes and offering loans for purchasing ICTs equipment.

One of the most important conclusions of this research is the clear existence of a Digital Divide within Syrian society, moreover, the low ICT infrastructure, insufficient ICT courses from both government and NGOs, inattention to enable people with special needs, ignoring citizens who speak local languages, and the high cost of affording adequate ICT tools prevent bridging the digital gap,

here, this research recommends upgrading available systems to have a multilanguage interface provides local languages (such as Aramaic, Arminian, Assyrian, Kurdish, Turkish, and Syriac) and international languages (international languages interface enables Syrians from the second and third generations who born and lived abroad and still have connections and interests in the home territory), especially there is a respectable percentage of Syrians settled abroad during the years of the current conflict, in addition, the government has to investigate proper solutions to enable people with special needs to use e-government portals, taking the benefits from the successful experiences in other countries.

These solutions give the opportunity to expand the e-government spread among more citizens, enhance the chances of its adoption by Syrians, and leave no one behind.

This research also concluded that Syrians see services provided by the national e-government as low-quality services and see that the websites are not simple nor easy to deal with, slow, and don't provide precise and up-to-date information, besides a long and inaccurate timeframe of service delivery, such as delivering the subsidized products like sugar, rice, benzine, diesel.

Moreover, the Syrian government, under the current conditions of war and sanctions, is not able to provide adequate infrastructure for financial transactions, besides most citizens don't have a bank account or a bank account that doesn't support online payment, to overcome this problem, the study advises the government to find a way to convince more people to have a bank account, especially among the new generation, facilitate it, and offer incentives for that, besides to develop the systems of public banks to get along with online banking methods and building a national network for online transaction engaging public and private banks.

From another perspective, citizens tend to consider that national e-government has a slight weakness in providing privacy through its websites from a service quality point of view, and they have suspicions that their personal information may be exposed to a breach by other governmental agencies, along with a lack of a clear privacy policy declared in websites, here, the responsible entities of the Syrian e-government should provide a clear privacy policy on the e-government websites, raise people's awareness of e-government work principles, and this may convince citizens that the e-government preserves their privacy by dealing with users anonymously during data analysis, moreover, the government has to investigate the source of the privacy concerns, if there is a real intervention in privacy done by governmental agencies through the applications, or generated from a lack of trust in the government itself.

In this regard, the overall citizens' trust in e-government tends to be neutral, this medium overall trust comes from apparent negative citizens' trust in the government itself (as the trust in e-services is positive), and here, this study advises the government to put plans for getting back citizens' trust in public institutions by organizing promotional campaigns that shed light on the reliability of government services, with the help of specialized accreditable promoting companies.

But this low neutral trust in e-government is confronted by high trust in performing financial transactions using e-government portals, as citizens see it as not risky to use these channels since they see the websites have sufficient security features, besides that people's evaluation of e-government creditability -in providing guaranteed services- has a little tendency to be positive, also citizens expressed positive perception of e-government reliability to accomplish the available tasks, here, the research sees promising possibilities in last positive conclusions to build trust in Syrian e-government, so, it is a good opportunity for responsible governmental agencies to boost these perceived positive ideas of security, reliability, and creditability among people by enhancing quality and speed of e-

government services delivery accompanied with planned promotional campaigns about the benefits and advantages of using them, to flip neutral trust to the positive side.

Also, low trust in the government itself is driven by citizens' perception that government doesn't consider peoples' interests is a normal result of years of war and collapsed economy, as people in general blame governments for bad economic situations regardless of the causes (Neundorf and Hobolt, 2018).

From another perspective, Syrian citizens are aware of the usefulness and benefits of using e-government in general, regardless of the other aspects that holdback their intention to use it, here, once again, the government has the opportunity to enhance the adoption of e-government by overcoming the negatives coming from other factors while citizens are still convinced of the importance and relevance benefits of using the e-government, this should be done as soon as possible before the negatives overwhelm the positive conviction and form persistence obstacles toward adoption of e-government not easy to overcome.

Furthermore, most users have negative prejudice about the unenjoyment experience of interacting with the e-government portal, which should drive the designers of e-government systems to rebuild the websites in a way that makes interaction via e-government an enjoyable experience.

Most citizens feel the specialty of persons who use e-government to fulfill their needed services, this result is an advantage to the Syrian e-government and would boost citizens' adoption if the government concentrates on implementing the national e-government fast enough and overcomes the weaknesses and hinderers within a suitable time frame before this image fades away otherwise, the government will need prolonged efforts to change the negative image of Syrian e-government.

In another context, most Syrians have a low intention to use e-government, whereas there is a respectful percentage of respondents (26%) have neutral intentions toward using e-government, those respondents represent a very important segment because they, with some efforts, may change their intentions to be positive, here, this research encourages the Syrian government to conduct expanded research on those who have neutral intentions toward using e-government to know exactly the obstacles that hinder them from deciding to use e-government, and another research focuses on people with a less negative willingness to use e-government. In the same regard, people under 50 years old intention to use e-government is almost neutral with a little tendency to be negative, which leads to advise the Syrian government to concentrate its efforts on people under 50 years to change their intention toward using e-government to the positive side.

12. LIMITATION OF THE STUDY

Field study Limitations

The first weakness of this study is that the research is not able to conduct surveys on Political, Organizational, and financial factors due to the complexity/sensitivity of the political and institutional situation, reservations of politicians and government employees to answer or make interviews openly, in addition to reservations from government entities to answer about financial provisions, supplies for e-infrastructures, and e-government clear plans with a scarcity in transparent reliable information.

Moreover, the research has a shortage of possibilities in the budget and time frame to conduct a sufficiently wide survey for assessing the digital gap, which needs the potential of governments or international organizations, such as the UN, OECD, and Eurostat, depending on that, the study used the accepted method used for assessing EG7 (E-government level 7) by United Nations Manual for measuring e-government by directing questionnaires to national experts.

Furthermore, for the same reasons of time and cost limitations, the research developed scales for assessing technological factors affecting e-government implementation and prepared the questionnaire, but this study couldn't conduct the fieldwork, which is reserved for future work.

Also, it is not safe to distribute questionnaires in hot spots or under the control of different militias involved in the Syrian conflict. The research distributed the questionnaires allocated for the regions with conflict to the internally displaced persons in Syria who still have relations with their original places, and this technique brings the risk of un-updated information of the situation on the ground in the targeted areas.

Limitations of Collecting e-government implementation affecting factors

E-government implementation affecting and success factors, barriers, obstacles, and failure determinants have been discussed by a huge number of books, articles, case studies, papers, and reports from many aspects and points of view, even from many disciplines of science, such as management and business, political, technological, financial, social and administrative sciences, that makes it almost impossible or impractical to discuss all of them in one research. This study settled with the collected data from more than 200 books, articles, case studies, papers, and reports, covering a variety of cases from different countries with different development levels and cultures and belonging to different disciplines of science.

13. FUTURE IMPLICATIONS RESEARCH

As the data collected from this research are fruitful and rich in information, the Author decided to use this data in future analysis concerns about the relation of ICT literacy and educational level with each of the social factors measured by this study.

Also, it is a good practice for e-government projects to conduct field studies using the FCCT model and its correlated tables, provided by this research, to assess the Political, Social, Technological, Organizational, and Financial aspects that confront e-government success on the ground.

As this study presented ready scales for assessing Technological factors affecting e-government implementation, the researcher intends to conduct a future field study to assess those factors within the Syrian context.

At last, the researcher plans to develop the FCCT to provide -besides to the factors affecting e-government and corresponding tables- tested scales to assess each of the Political, organizational, Social, Technological, and Financial groups of factors and attach corresponding questionnaires, taking in regard that this dissertation has already presented two of those groups (Social and Technological questionnaires).

14. NEW SCIENTIFIC ADDITION OF CURRENT RESEARCH

This research provided new important additions to the literature concerning e-government field of study:

- 1- This research presents the Five Categories Classification Tool (FCCT) Model, which forms with the corresponding tables a ready tool for researchers to find easily the factors affecting e-government refined in five main fields of concern; Social, Technological, Political, Organizational, and Financial disciplines, containing all factors interact with e-government found in the literature with brief hints of measurements and studies, hence, the researchers interested with the e-government context don't have to search for these factors in the literature and can immediately begin their studies depending on these factors, each in his discipline, Figure 4, Tables 1-5.
- 2- The study presents new scales for assessing Social and Technological factors, Tables 10,11.
- 3- The research defines the Social factors affecting e-government implementation in the Syrian context, those are: Perceived Trust, Perceived Risk, Perceived Security, Perceived Privacy, Perceived Uncertainty, Perceived Awareness, ICT Knowledge, Perceived ICT Ability to deal with e-government, Perceived Service Quality, Satisfaction, Perceived Usefulness/ Benefit, Perceived Image of using e-government, Attitude, Intention, and Digital Divide, Figure 11.

The above-mentioned 15 factors considered the social factors affecting e-government context in bad economic countries suffering from armed conflicts and wars (Syrian Arab Republic as an example of those countries).

- 4- This study proved that the Education level is not an affecting factor in the Syrian e-government implementation case, which goes against the common consensus in the literature that there is a relation between education level and intention to use e-services. This drives the research to conclude that the other factors affecting the Syrian e-government succeeded in hiding the impact of the education level.

The Educational level loses its importance in affecting e-government adoption in bad economic countries suffering from armed conflicts (Syrian Arab Republic as an example of those countries).

- 5- This study found that the Perceived Compatibility of e-government systems (personal compatibility) has no significant impact on Syrian e-government Adoption. In other words:

The systems' Compatibility with users' personalities loses its importance in affecting e-government adoption in bad economic countries suffering from armed conflicts (Syrian Arab Republic as an example of those countries).

- 6- The research statistically proved the existence of a Digital Divide in Syria through the years of armed conflict in Syria.

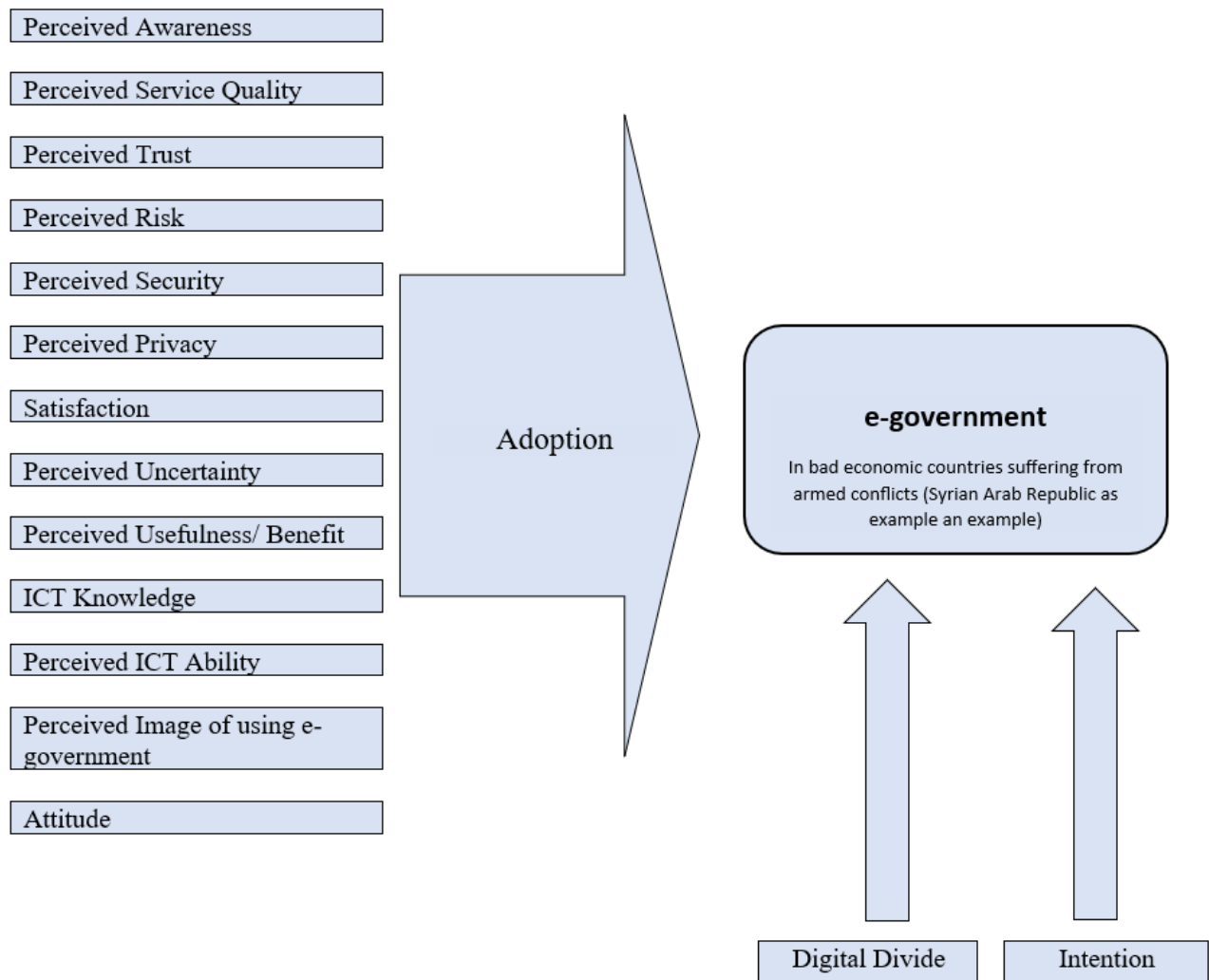


Figure 11. Social affecting factors on e-government implementation in bad economic countries suffering from armed conflicts (Syrian Arab republic as an example)
Source: Author own development (2023)

15. SUMMARY

15.1 Introduction

This research aims to empirically test the Social factors that affect Syrian e-government implementation, besides providing a powerful tool for those interested in the e-government context containing all factors that interfere e-government context discussed in the literature. Also, the study presents new scales for assessing Social and Technological factors regarding the e-government field of study.

15.2 Literature review

The literature review in this work is an essential part of the exploratory research, as the study began with browsing the literature related to the e-government context, after that the research gathered all the factors found in the literature that discussed the e-government field by using more than 200 research, books, articles, papers, and reports worldwide concerning e-government issues and covering diversity in the studied backgrounds (involving different groups of countries, cultures, and economic levels).

Also, the research in this chapter classified the resulting affecting factors into five groups that cover five research areas (Political, Social, Technological, Organizational, and financial disciplines), depending on this classification, the study developed a new tool called the Five Categories Classification Tool (FCCT) provides a model consists of the five mentioned groups, and correlates them with the five correlated tables each table presents one group of factors accompanied with hints of items and scales that measure each factor and with examples of the studies that discuss those factors.

At the end of this chapter, the study provides the FCCT that forms a concrete base for the next steps of this research to start the empirical study, here, the FCCT model and its correlated tables form a powerful tool for those concerned with e-government context to perform immediately their research or empirical studies each in his discipline without the need for reviewing the literature to find factors affecting e-government projects in a specific research area.

15.3 Results

This research found that most Syrians (55%) are already familiar with the e-government concept, whereas (45%) of them are aware of the Syrian e-government.

The statistical analysis used by this study shows that Syrian citizens have a relatively neutral tendency to trust e-government services with a little bias to being negative, and trust, in this case, emerges from trust in e-government (that Syrians tend to trust) and trust in the government itself (that Syrians tend to have low trust), also, citizens see it is not risky to use the national e-government, as the e-government website has a security features according to their evaluation, in contrast, they considered that e-government has a slight weakness in providing privacy through its websites with a high preference of conventional methods over e-government in performing tasks, as they have a high uncertainty to perform them online via e-government portal.

In general, citizens are not satisfied with the services provided by the e-government, and most of them (64.2%) do not feel that performing tasks via e-government websites is compatible with their

personality, despite they admit the usefulness and benefits of using e-government. Besides, most Syrians (86%) see the national e-government as a low-quality service provider.

Also, this research declares that Syrians have low self-confidence in using e-government services properly, despite they have high knowledge of using ICT devices and online applications, and in reverse to the expected result, there is no significant impact of Syrian citizens' Education Level on their intention to use e-government.

From another perspective, most citizens (90%) feel the specialty of the persons who use e-government to fulfill their needed services.

Furthermore, the research found that (16%) of Syrians have the intention to use the national e-government, (26%) have a neutral intention while (58%) do not intend to deal with it.

Also, the study confirmed that Syrians have a negative attitude toward the Syrian e-government. Besides, most of them (76%) do not tend to adopt it.

From another point of view, the research has statistically proved the existence of a Digital Divide in Syrian society.

Finally, this research confirmed that there are 15 social factors are significantly affecting Syrian e-government implementation, those are: Perceived Trust, Perceived Risk, Perceived Security, Perceived Privacy, Perceived Uncertainty, Perceived Awareness, ICT Knowledge, Perceived ICT Ability to deal with e-government, Perceived Service Quality, Satisfaction, Perceived Usefulness/Benefit, Perceived Image of using e-government, Attitude, Intention, and Digital Divide, meanwhile the Perceived Compatibility (personal Compatibility) and Education level have no significant impact on e-government implementation in Syria.

Table 50 summarizes the Social factors that affect the Syrian e-government and their impact strength.

Table 50. Assessment of Social factors affecting e-government implementation in Syrian case study.

Social factor	Relation strength with Syrian e-government			
	Strong	Moderate	Weak	Non-significant relation
Perceived Awareness		X		
Perceived Service Quality			X	
Perceived Trust	X			
Perceived Risk	X			
Perceived Security		X		
Perceived Privacy		X		
Satisfaction		X		
Perceived Uncertainty	- X			
Perceived Compatibility (personal compatibility)				X
Perceived Usefulness/ Benefit	X	X		
ICT Knowledge	X			
Perceived ICT Ability		X		
Education level				X

Perceived Image of using e-government	X			
Attitude		X		
Intention	The relation confirmed, the strength not assessed statistically.			
Digital Divide	The relation confirmed, the strength not assessed statistically.			

Source: Author's own development (2023).

15.4 Conclusions and recommendations

One of the important conclusions this study presents is that there are two Social factors considered important in affecting e-government implementation in developed countries with stable economic and political situations, those are the Education level and the Compatibility of electronic systems with the personality of e-government users, the mentioned two factors lost their importance or were hindered by surrounding circumstances to affect the national e-government in developing countries with a collapsed economy suffering from continued 12 years of armed conflict, taking the Syrian Arab Republic as an example of those countries.

Moreover, this study concluded that even though Syrians have enough ICT knowledge, they are not familiar with dealing with the services the Syrian e-government provides.

On the other hand, the research asserts that there is a clear weakness in the training that targets explaining the possibilities of e-government and a shortage in the campaigns that aim to raise citizens' awareness of the national e-government.

From another perspective, citizens have high trust in performing financial transactions using e-government portals, as citizens see it as not risky to use these channels since they see the websites have sufficient security features.

Furthermore, even though Syrians have sufficient ICT knowledge and the ability to deal with e-government, more than half of them are unable to participate in e-government because they cannot afford the necessary ICT devices.

Finally, this research affirms that there is a clear existence of a Digital Divide within Syrian society.

This research recommends the Syrian government:

- Start national training campaigns to increase citizens' self-ability to use ICTs for interacting with e-government independently, especially for the older generation. Besides that, it is important to train the employees to boost support and feedback to the users.
- Give wide support to NGOs initiatives and provide them with all the possibilities to start ICT courses on the national base, as their flexible structure, agility, and international/ regional relations are relatively more suitable for work under conflicts.
- Establish, with the cooperation of NGOs, public places allocated for interacting with e-government to increase its adoption among citizens.
- Find solutions to support internet costs to enable more people engaging e-process, such as reducing taxes and offering loans for purchasing ICTs equipment.
- Upgrade e-government systems to have a multilanguage interface that provides local languages (such as Aramaic, Arminian, Assyrian, Kurdish, Turkish, and Syriac) and international languages

to enable all Syrians in all regions within Syrian territory and those who were born abroad to deal with the national e-government.

- Investigate proper solutions to enable people with special needs to use e-government portals.
- Develop the systems of all public banks to get along with online banking methods and build a national network for online transactions engaging public and private banks.
- Organize promotional campaigns -with the help of specialized accreditable promoting companies- explaining e-government work principles to convince citizens that e-government preserves their privacy by dealing with users anonymously during data analysis.

REFERENCES

- Abu-Shanab, E. (2014): *Electronic Government: A Tool for Good Governance and Better Service*. 2nd Edition, Irbid. Dar- Alketab Publishers.
- Accenture (2003): E-government leadership: Realizing the vision. The Government Executive Series. *E-Government Report*.
- Ahmad, M., Markkula, J. and Oivo, M. (2013): Factors Affecting E-Government Adoption in Pakistan: A Citizen's Perspective. *Transforming Government: People, Process and Polic*, 7(2), 225-239. <http://dx.doi.org/10.1108/17506161311325378>.
- AGIMO (Australian Government Information Management Office). (2003): E-government benefits study: Demand for E-government. Department of Finance and Administration, Australian Government.
- Al-Adawi, Z., Yousafzai, S., and Pallister, J. (2005): Conceptual model of citizen adoption of e-government. *The Second International Conference on Innovations in Information Technology (IIT'05)*, pp. 1–10.
- Alassaf, P., Bahna, M., El-assaf, B.M. (2020b): The relation between Online protection regulations and the intention to use e-services/ Age perspective: Case study of Hungary. HUNGARIAN AGRICULTURAL ENGINEERING. 2020. Published online: <http://real.mtak.hu/121692/1/38-2020-02-10.17676HAE.2020.38.15.pdf>, DOI: 10.17676/HAE.2020.38.15
- Alassaf, P., Szalay, G. Z. (2020): Transformation toward e-learning: experience from the sudden shift to e-courses at covid-19 time in Central European countries; students' satisfaction perspective. *Studia Mundi – Economica*, 7(3), 75-85. ISSN 2415-9395. Doi: <https://doi.org/10.18531/Studia.Mundi.2020.07.03.75-85>
- Alassaf, P., Szalay, G. Z. (2022): The Impact of 'Compulsory' Shifting to Use e-Services during COVID-19 Pandemic Restrictions Period on e-Services Users' Future Attitude and Intention "Case Study of Central European Countries/Visegrád Group (V4). *Sustainability*, 14, 9935. <https://doi.org/10.3390/su14169935>
- Alassaf, P., Zaien, S., Oláh, J. (2020a): Factors affecting e-government implementation: developing countries e-opportunities. *Acta Oeconomica Universitatis Selye*, 9(1), 7-23. DOI: <http://dx.doi.org/10.36007/Acta.2020.9.1.1>
- Al Hujran, O., Aloudat, A., and Altarawneh, I. (2013): Factors Influencing Citizen Adoption of E-Government in Developing Countries. *International Journal of Technology and Human Interaction*, 9(2), 1–19. doi:10.4018/jthi.2013040101
- Al-Khoury, A. M., Bal, J. (2007): Electronic Government in the GCC Countries. *International Journal of Social Sciences*, 1(2), 83-98.
- Alomari, M., Sandhu, K. and Woods, P. (2009): E-Government Adoption in the Hashemite Kingdom of Jordan: Factors from Social Perspectives. *Proceedings of the International*

Conference for Internet Technology and Secured Transactions. London. 9-12 November 2009. 1-7. DOI: 10.1109/ICITST.2009.5402528

Alomari, M. K., Sandhu, K., and Woods, P. (2010): Measuring Social Factors in E-government Adoption in the Hashemite Kingdom of Jordan. *International Journal of Digital Society (IJDS)*, 1(2). Doi: 10.20533/ijds.2040.2570.2010.0017

Al-Shafi, S.H. (2009): *Factors affecting e-government implementation and adoption in the state of Qatar*. PhD thesis. Brunel University. London.

Al-Shboul, M., Rababah, O., Ghnemat, R., Al-Saqqa, S. (2014): Challenges and Factors Affecting the Implementation of E-Government in Jordan. *Journal of Software Engineering and Applications*, 7(13), 1111-1127. DOI: 10.4236/jsea.2014.713098

Angst, C. M., and Agarwal, R. (2009): adoption of electronic health records in the presence of privacy concerns: The elaboration likelihood model and individual persuasion. *MIS Quarterly*, 33(2), 339–370.

Andréasson, E. (2015): Digitalisering i den offentliga förvaltningen : IT, värden och legitimitet. *PhD dissertation*. Linköping University Electronic Press. Linköping: Linköping University Electronic Press, 2015, p. 336. <https://doi.org/10.3384/diss.diva-121837>

Anthopoulos, L. G., Siozos, P., and Tsoukalas, L. A. (2007): Applying Participatory Design and Collaboration in Digital Public Services for Discovering and Re-designing E-government Services. *Government Information Quarterly*, 24(2), 353–376.

Anthopoulos, L., Reddick, C. G., Giannakidou, I., and Mavridis, N. (2016): Why e-government projects fail? An analysis of the Healthcare.gov website. *Government Information Quarterly*, 33, 161–173.

Arnstein, S. R. (1969): A ladder of citizen participation. *Journal of the American Institute of Planners*, 35(4), 216–224. DOI: 10.1080/01944366908977225

Ashaye, O. O. R. (2014): Evaluating the implementation of e-government in developing countries: The case of Nigeria. Ph.D. dissertation Brunel business school, Brunel University, London, England.

Basamh, S., Qudaih, H., Suhaimi, M. (2014): E-Government Implementation in the Kingdom of Saudi Arabia: An Exploratory Study on Current Practices, Obstacles and Challenges. *International Journal of Humanities and Social Science*, 4 (2), 296-300.

Basu, S. (2004): E-government and developing countries: an overview. *International Review of Law, Computers and Technology*, 18, 109-132.

Baum, C. H. and Di Maio, A. (2000): Gartner's Four Phases of E-Government Model: Gartner Group. Gartner Research Publication TU-12-6113, Stanford, CT, USA.

Bekkers, V. J. J. M., Tummers, L. G., Voorberg, W. H. (2013): From public innovation to social innovation in the public sector: A literature review of relevant drivers and barriers. *Rotterdam: Erasmus University Rotterdam*.

Belanger, F., Carter, L. (2008): Trust and risk in e-government adoption. *Journal of Strategic Information System*,. 17 (2008), 165–176.

Bernhard, I. (2014): E-government and E-governance Local Implementation of E-government Policies in Sweden. *Doctoral Thesis*. Kungliga Tekniska Högskolan. Royal Institute of Technology. School of Architecture and the Built Environment. Department of Urban Planning and Environment. Division of Urban and Regional Studies SE-100 44 Stockholm, Sweden. <http://www.kth.se>.

Bernhard, I. and Grundén, K. (2013): Challenging Organizational Issues When Municipal Contact Centers Are Implemented. *Electronic Journal of e-Government*, 11 (1), 198-209.

Benoit, P. (1996): Project finance at the World Bank: An overview of policies and instruments. *World Bank Technical Paper Number 312*. Washington, DC: The World Bank.

Bonham, G., Seifert, J. and Thorson, S. (2001): The Transformational Potential of E-Government: The Role of Political Leadership. *Proceedings of 4th Pan European International Relations Conference*. Canterbury. 6-10 September 2001, 1-9.

Bovaird, T., Loeffler, E. (2012): From Engagement to Co-Production: The Contribution of Users and Communities to Outcomes and Public Value. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations*, 23(4), 1119–1138. DOI: 10.1007/s11266-012-9309-6

Bradburn, N. M., Sudman, S., Wansink, B. (2004): *Asking questions: the definitive guide to questionnaire design--for market research, political polls, and social and health questionnaires*. John Wiley and Sons.

Brown, A., Fishenden, J., Thompson, M. and Venters, W. (2017): Appraising the impact and role of platform models and government as a platform (GaaP) in UK government public service reform: Towards a platform assessment framework (PAF). *Government Information Quarterly*, 34(2), 167–182.

Brown, M., and Muchira, R. (2004): Investigating the relationship between internet privacy concerns and online purchase behavior. *Journal of Electronic Commerce Research*, 5(1), 62–70.

Buhr, D. (2015): Industry 4.0, New Tasks for Innovation Policy. © Friedrich-Ebert-Stiftung, 2015. ISBN: 978-3-95861-167-2. Available online from: <http://library.fes.de/pdf-files/wiso/11480.pdf>.

Burn, J. and Robins, G. (2003): Moving towards e-government: a case study of organisational change processes. *Logistics Information Management*, 16, 25-35.

Bwalya, K. (2009): Factors Affecting Adoption of E-Government in Zambia. *The Electronic Journal of Information Systems in Developing Countries*, 38(4), 1-13. <http://www.ejisd.org/ojs2.../index.php/ejisd/article/viewFile/573/286>.

Cakir, R. and Solak, E. (2014): Exploring the factors influencing E-learning of Turkish EFL learners through TAM. *TOJET: The Turkish Online Journal of Educational Technology*, 13(3), 68-76.

Carter, L., Belanger, F. (2005): The utilisation of e-Government services: citizen trust, innovation

and acceptance factors. *Information Systems Journal*, 15(1), 5-25.

Carter, L., Weerakkody, V. (2008): *E-government adoption: A cultural comparison*. *Information Systems Frontiers*, 10(4), 473–482. doi:10.1007/s10796-008-9103-6

Central Bureau of Statistic. (2017): Indicators estimate of the population in Syria by governorates 2016. *Population and Demographic, Yearbook, Chapter2*. <http://cbssyr.sy/yearbook/2017/Data-Chapter2/TAB-4-2-2017.pdf>.

Central Bureau of Statistic. (2018): statistical abstract 2018. <http://www.cbssyr.sy/index-EN.htm>.

Chadwick, A. (2011): Explaining the failure of an online citizen engagement initiative: The role of internal institutional variables. *Journal of Information Technology and Politics*, 8(1), 21–40.

Chang, C., Juang, W., Tseng, K., Hu, L. (2019): Cross-boundary e-government systems: Determinants of performance. *Government Information Quarterly*, 36 (3), 449-459. 2019 Elsevier Inc. DOI: 10.1016/j.giq.2019.02.001.

Chatzoglou, P., Sarigiannidis, L., Vraimaki, E., and Diamantidis, A. (2009): Investigating Greek employees' intention to use web- based training. *Computers and Education*, 53(3), 877- 889. DOI: 10.1016/j.compedu.2009.05.007

Chen, Y. - C., Thurmaier, K. (2005): Government to citizen electronic services: Understanding and driving adoption of online transactions. *The Association for Public Policy and Management (APPAM) conference*, Washington., 3- 6 Nov.

CIA World Factbook. (2020): Website. [retrieved on February 25th, 2020]: <https://www.cia.gov/the-world-factbook/field/age-structure>

Collier, J. E., Bienstock, C. C. (2006): Measuring service quality in e-retailing. *Journal of Service Research*, 8(3), 260–275.

Commission of the European Communities. (2001): E-Government Indicators for Benchmarking e-Europe: Europe's Information Society. (Brussels: European Commission).

Conklin, A., White, G. B. (2006): E-government and cyber security: the role of cyber security exercises. *Proceedings of the 39th annual hicss*. Ieee computer society.

Council of Europe (2009): Electronic democracy (e-democracy). Recommendation CM/Rec (2009)1 adopted by the Committee of Ministers of the Council of Europe on 18 February 2009 and explanatory memorandum. Strasbourg: *Council of Europe Publishing*.

Dabholkar, P. (1996): Consumer evaluations of new technology-based self-service options. An investigation of alternative models of service quality. *International Journal of Research in Marketing*, 13 (1), 29-51.

Dabija, D.C., Postelnicu, C., Pop, N.A. (2014): Methodology for Assessing the Degree of Internationalization of Business Academic Study Programs. *Amfiteatru Economic*, 16(37), 726-745.

- Dada, D. (2006): The failure of e-government in developing countries: a literature review. *Electronic Journal of Information Systems in Developing Countries, EJISDC*, 26(7), 1-10.
- D'Alessandro, S., Girardi, A., and Tiangsoongnern, L. (2012): Perceived risk and trust as antecedents of online purchasing behavior in the USA gemstone industry. *Asia Pacific Journal of Marketing and Logistics*, 24(3), 433–460. doi:10.1108/13555851211237902
- Davis, F. D. (1989): Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 318-340.
- DeBenedictis, A., Howell, W., Figueroa, R., and Boggs, R. A. (2002): E-government defined: an overview of the next big information technology challenge. *Issues in Information Systems*, 3(1), 130- 136.
- DeLone, W. H., and McLean, E. R. (2003): The DeLone and McLean Model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9–30.
- Dimitrova, D., Chen, Y. C. (2006): Profiling the adopters of e-government information services: the influence of psychological characteristics, civic mindedness, and information channels. *Social Science Computer Review*, 24(2), 172-188
- Devaraj, S., Fan, M., Kohli, R. (2002): *Antecedents of B2C Channel Satisfaction and Preference: Validating e- Commerce Metrics. Information Systems Research*, 13(3), 316-333. doi:10.1287/isre.13.3.316.77
- Dopson, S., Stewart, R (1993): Information Technology, Organisational Restructuring and The Future of Middle Management. *New Technology Work and Employment*, 8(1), 10–20.
- Dowland, P., Papadaki, M., Alharbi, N. (2014): Security Factors Influencing End Users' Adoption of E-Government. *Journal of Internet Technology and Secured Transactions (JITST)*, 3(4), 320-328.
- Dwivedi, Y. K., Wastell, D., Laumer, S., Henriksen, H. Z., Myers, M. D., Bunker, D., Srivastava, S. C. (2015): Research on information systems failures and successes: Status update and future directions. *Information Systems Frontiers*, 17(1), 143–157.
- Ebrahim, Z., Irani, Z. (2005): E-government adoption: architecture and barriers. *Business Process Management Journal*, 11, 589- 611.
- Eggers, W. D. (2004): Boosting e-government adoption. Deloitte research-public sector, Canada, *FTA Annual Conference*.
- Elnaghi, M., Alshawi, S., and Missi, F. (2007): A leadership model for e-government transformation. *Proceedings of European and Mediterranean conference on information systems (emcis07)*, 2007, 1-12. Valencia, Spain.
- Esterhuyse, M. P., Scholtz, B. M., and Venter, D. (2016): Intention to use and satisfaction of e-learning for training in the corporate context. *Interdisciplinary journal of information, knowledge, and management*, 11, 347- 365. DOI: <https://doi.org/10.28945/3610>.

- Evans, D., and Yen, D. C. (2006): E-Government: Evolving relationship of citizens and government, domestic, and international development. *Government Information Quarterly*, 23(2), 207–235. doi:10.1016/j.giq.2005.11.004
- Evans, J.D. (1996): *Straightforward Statistics for the Behavioral Sciences*. Brooks/Cole Publishing; Pacific Grove, Calif. 1996. ISBN: UCSC:32106013017055
- Eyob, E. (2004): E-government: breaking the frontiers of inefficiencies in the public sector. *Electronic Government, an International Journal*, 1 (1), 107- 114.
- Eynon, R., Dutton. W. (2007): Barriers to Networked Governments. Evidence from Europe. *Prometheus*, 25(3), 225-242.
- Farahat, T. (2012): Applying the technology acceptance model to online learning in the Egyptian universities. *Procedia-Social and Behavioral Sciences*, 64, 95–104.
- Fassnacht, M., Koese, I. (2006): Quality of Electronic Services: Conceptualizing and Testing a Hierarchical Model. *Journal of Service Research*, 9 (1), 19– 37.
- Fath-Allah, A., Cheikhi, L., Al-Qutaish, R.E and Idri, A. (2014): e-Government maturity models: a comparative study, *International Journal of Software Engineering & Applications*, 5(3), 71-91. [Available online]: <http://airccse.org/journal/ijsea/papers/5314ijsea06.pdf>. [Accessed, April 10th, 2020].
- Fedorowicz, J., Gelinis, U. J., Gogan, J. L., Williams, C. B. (2009): Strategic alignment of participant motivations in e-government collaborations: The Internet Payment Platform pilot. *Government Information Quarterly*. 26, 51-59.
- Ferro, E., Helbig, N. C., & Gil-Garcia, J. R. (2011): *The role of IT literacy in defining digital divide policy needs*. *Government Information Quarterly*, 28(1), 3–10. doi:10.1016/j.giq.2010.05.007
- Field, T., Muller, E., Lau, E., Gadriot-Renard, H., Vergez, C. (2003): The Case for E-Government: Excerpts from the OECD Report “The E-Government Imperative”. *OECD Journal on Budgeting*, 3(1), 61-131. <http://dx.doi.org/10.1787/budget-v3-art5-en>.
- Fletcher-Brown, J., Turnbull, S., Viglia, G., Chen, T., Pereira, V. (2021): Vulnerable consumer engagement: How corporate social media can facilitate the replenishment of depleted resources. *International Journal of Research in Marketing*. 38(2), 10.1016/j.ijresmar.2020.06.002
- Foddy, W. (1993): *Constructing Questions for Interviews and Questionnaires: Theory and Practice in Social Research*. Cambridge: Cambridge University Press. doi:10.1017/CBO9780511518201
- Gal, T., Nagy, L., David, L., Vasa, L., Balogh, P. (2013): Technology planning system as a decision support tool for dairy farms in Hungary. *Acta Polytechnica Hungarica*, 10 (8), 231- 244.
- Gefen, D., Straub, D. (2000): The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption. *Journal of the Association for Information Systems*, 1(8), 1-30. DOI: 10.17705/1jais.00008

- Gilbert, D., Balestrini, P., Littleboy, D. (2004): Barriers and benefits in the adoption of e-government. *The International Journal of Public Sector Management*, 14(4), 286–301.
- Gronier, G., and Lambert, M. (2010): A model to measure the perceived quality of service in e-government. in *Proceedings of the 10th European Conference on EGovernment*, Limerick, Ireland.
- Gunawardena, C. N., and Zittle, F. J. (1997): Social presence as a predictor of satisfaction with a computer-mediated conferencing environment. *American Journal of Distance Education*. 11, 8-26.
- Guo, X., Ling, K. C., and Liu, M. (2012): Evaluating Factors Influencing Consumer Satisfaction towards Online Shopping in China. *Asian Social Science*, 8(13). doi:10.5539/ass.v8n13p40
- Hamner, M., Taha, D., Brahim, S. (2010): Human Factors in Implementing E-Government in Developing Countries. In C. Reddick (Ed.), *Citizens and E-Government: Evaluating Policy and Management* (pp. 184-206), IGI Global. DOI:10.4018/978-1-61520-931-6.ch010
- Harrikari, T., Rauhala, P.-L. (2014): *Social Change and Social Work: The Changing Societal Conditions of Social Work in Time and Place*. (1st ed.). Routledge. DOI: 10.4324/9781315609423
- Heeks, R. (2001): Building e-governance for development: A framework for national donor action. *E-Government working paper series*. In E-government working paper series. (p. 33). UK: University of Manchester.
- Heeks, R. (2003): Most E-government for Development Projects Fail: How Can Risks be Reduced?. *Working paper*. Published by Institute for Development Policy and Management. University of Manchester.
- Heeks, R. (2006): *Implementing and Managing E-Government: An International Text*. London: SAGE Publications.
- Heeks, R. (2015): A Better e-Government Maturity Model. *Technical Report. iGovernment Briefing*. No. 9. July 2015. Centre for Development Informatics, University of Manchester. DOI: 10.13140/RG.2.2.10311.44967.
- Hiller, J., Belanger, F. (2001): *Privacy strategies for electronic government*, E-government series. Arlington, VA: Pricewaterhouse Coopers Endowment for the business of Government
- Homburg, V. (2008): *Understanding E-government. Information Systems in Public Administration*. London and New York: Routledge.
- Hsu, C.L., Chang, K.C., Chen, M.C. (2012): The impact of website quality on customer satisfaction and purchase intention: Perceived playfulness and perceived flow as mediators. *Inf. Syst. E-Bus. Manag*, 10, 549–570.
- ITU (International Telecommunications Union). (2015): *The state of broadband report*. [Online]: www.broadbandcommission.org/documents/reports/bbannualreport 2015. Pdf.
- ITU. (2019): Digital transformation and the role of enterprise architecture. *Thematic reports*. ITU

Publications. International Telecommunication Union, Telecommunication Development Bureau. ISBN: 978-92-61-29011-5.

Janda, S., Trocchia, P. J., Gwinner, K. P. (2002): Consumer perceptions of Internet retail service quality. *International Journal of Service Industry Management*, 13(5), 412-431. doi:10.1108/09564230210447913

Jansson, G. (2013): A Legitimate (Electronic) Government? On IT-Development in Local Government. *Academic dissertation*. Linköping University. Sweden.

Joshi, P., Islam, S. (2018): E-Government Maturity Model for Sustainable E-Government Services from the Perspective of Developing Countries. *Sustainability*, 10, 1882. DOI:10.3390/su10061882

Kamolov, S. G, Konstantinova, A. N. (2017): E-government: Way of modernization and efficiency enhancement of public governance. *J. Law Adm (Право и управление)*, 1, 13-21. DOI:10.24833/2073-8420-2017-1-42-13-21.

Kassen, M. (2014): Globalization of e-government: open government as a global agenda; benefits, limitations and ways forward. *Information Development*, 30(1), 51–58.

Keen, M. (1992): Successful applications of AI in manufacturing industry, *IEE Colloquium on Industrial Applications of AI (Artificial Intelligence)*, (Digest No.014), London, UK, 1992, pp. 5/1-5/4.

Kim, S., Kim, H. J. and Lee, H. (2009): An institutional analysis of an e-government system for anti-corruption: The case of OPEN. *Government Information Quarterly*, 26, 42-50.

Kim, H. J., Pan, G., Pan, S. L. (2007): Managing IT-enabled transformation in the public sector: A case study on e-government in South Korea. *Government Information Quarterly*, 24 (2007) 338–352

Kim, M., Kim, J. -H., and Lennon, S. J. (2006): Online service attributes available on apparel retail website: An E-S-QUAL approach. *Managing Service Quality*, 16(1), 51–77.

Kumar, R. and Best, M. (2006): Impact and Sustainability of E-Government Services in Developing Countries: Lessons M. learned from Tamil Nadu, India. *The Information Society*, 22(1), 1-12. <http://dx.doi.org/10.1080/01972240500388149>.

Kumar, V., Mukerji, B., Irfan, B. and Ajax, P. (2007): Factors for Successful e-Government Adoption: A Conceptual Framework. *The Electronic Journal of e-Government*, 5(1), 63-77.

Layne, K., Lee, J. (2001): Developing Fully Functional e-Government: A Four Stage Model. *Government Information Quarterly*, 18(2), 122–36.

Lai, C., and Pires, G. (2010): Testing of a model evaluating e-government portal acceptance and satisfaction. *The Electronic Journal Information Systems Evaluation*, 13(1), 35–46.

Lawrence, T. B., Suddaby, R. (2006): Institutions and institutional work. In S. R. Clegg, C. Hardy, T. B. Lawrence, and W. R. Nord (Eds.), *Handbook of organization studies*, pp. 215–254. 2nd ed. London: Sage.

- Lee, G., Lin, H. (2005): Customer perceptions of e-service quality in online shopping. *International Journal of Retail and Distribution Management*, 33(2), 161- 176. doi: 10.1108/09590550510581485
- Lee, H., Irani, Z., Osman, I. H., Balci, A., Ozkan, S., Medeni, T. D. (2008): Toward a reference process model for citizen-oriented evaluation of e-Government services. *Transforming Government: People, Process and Policy*, 2(4), 297-310.
- Lentner, Cs., Nagy, L., Vasa, L. Hegedus, Sz. (2019): Sustainability and Control Issues of the Financial Management of Local Governments, Through Hungary's Example. *Visegrad Journal on Bioeconomy and Sustainable Development*, 8(1), 18- 26.
- Lin, C. J., and Lu, H. (2000): Towards an Understanding of the Behavioral Intention To Use A Website. *International Journal of Information Management*, 20(3), 197–198.
- Lin, C-H., Yu, S-F. (2006): Consumer Adoption of the Internet as a Channel: The influence of driving and inhibiting factors. *The journal of American Academy of Business*, 9(2), 112-117.
- Lindblad-Gidlund, K, Ekelin, A., Eriksén S. and Ranerup, A. (2010): Förvaltning och medborgarskap i förändring, etablerad praxis och kritiska perspektiv. [Ongoing change in public administration and citizenship, established practice and critical perspectives], Lund: Studentlitteratur.
- Loiacono, E.T., Watson, R.T., Goodhue, D.L. (2007): WebQual: An instrument for consumer evaluation of web sites. *International Journal of Electronic Commerce*, 11(3), 51-87. doi:10.2753/jec1086-4415110302.
- Lnenicka, M., Nikiforova, A. (2021): *Transparency-by-design: What is the role of open data portals? Telematics and Informatics*, 61, 101605. doi: 10.1016/j.tele.2021.101605
- Madon, S., Reinhard, N., Roode, D., Walsham, G. (2007): Digital Inclusion Projects in Developing Countries: Processes of Institutionalization. *Proceedings of the 9th International Conference on Social Implications of Computers in Developing Countries*. São Paulo, Brazil.
- Mahmodi, M. (2017): The analysis of the factors affecting the acceptance of E-learning in higher education. *Interdisciplinary Journal of Virtual Learning in Medical Sciences*, 8(1), 0- 0. DOI: 10.5812/ijvlms.11158.
- Mahrer, H. and Krimmer, R. (2005): Towards the enhancement of e-democracy: Identifying the notion of the middleman paradox. *Information Systems Journal*. 15(1), 27–42.
- Manda and Soumaya. (2019): Responding to the challenges and opportunities in the 4th Industrial revolution in developing countries. *In Proceedings of the 12th International Conference on Theory and Practice of Electronic Governance (ICEGOV2019)*. Melbourne. VIC. Australia. April 3-5. 2019. <https://doi.org/10.1145/3326365.3326398>.
- Marchewka, J. T. (2006): Information technology project management: providing measurable organizational value, Wiley.
- Marchionini, G., Samet, H. Brandt, L. (2003): Digital Government. *Communication of the ACM*,

46(1), 24-27. doi:10.1145/602421.602440

McLoughlin, I. and Wilson, R. (2013): *Digital Government at Work, A Social Informatics Perspective*. Oxford University Press. ISBN 978-0-19-955772-1.

Mensah, I. K., Zeng, G., & Luo, C. (2020): E-Government Services Adoption: An Extension of the Unified Model of Electronic Government Adoption. *SAGE Open*, 10(2). doi: 10.1177/2158244020933593

Meyer, D.F., Meyer, N. and Neethling, J.R. (2016): Perceptions of business owners on service delivery and the creation of an enabling environment. *Administratio Publica*, 24(3): 52-73.

Meyer, N., Hamilton. L. (2019): Female entrepreneurs' business training and its effect on various entrepreneurial factors: Evidence from a developing country. *International Journal of Economics and Finance Studies*, 12 (1), pp. 135-151.

Miyazaki, A.D. and Fernandez, A. (2001): Consumer perceptions of privacy and security risks for online shopping. *The Journal of Consumer Affairs*, 35(1), 27-44

Morton, S. T. (1993): Socialization- related learning, job satisfaction, and commitment for new employees in a federal agency. *Unpublished doctoral dissertation*. Faculty of Virginia polytechnic institute and state university. Blacksburg. Virginia.

Murru, M. L. (2003): E-Government: From real to virtual democracy (pp. 5). Brussels: Boston University.

Nabafu, R. and Maiga, G. (2012): A Model of Success Factors for Implementing Local E-Government in Uganda. *Electronic Journal of E-Government*, 10(1), 31-46.

Nunnally, J.C. *Psychometric Theory*. 2nd ed., McGraw-Hill, New York, NY. 1978.

Ndou, V. (2004): E-Government for Developing Countries: Opportunities and Challenges. *The Electronic Journal of Information Systems in Developing Countries*, 18. 1-24.

<http://www.ejisdc.org/ojs2/index.php/ejisdc/article/view/110/110>.

Nkohkwo, Q. N., Islam, M. S. (2013): Challenges to the Successful Implementation of e-Government Initiatives in Sub-Saharan Africa: A Literature Review. *Electronic Journal of e-Government*, 11 (2): 253- 267.

OECD. (2001): The Hidden Threat to E-Government: Avoiding large government IT failures. Public Management (PUMA) Policy Briefing No.8, March 2001.

OECD. (2003): The e-Government Imperative. OECD e-Government Studies, Paris.

OECD. (2009): Focus on Citizens: Public Engagement for Better Policy and Services. OECD publications. ISBN Number: 9789264048867.

Ojha, S., Pandey, I. M. (2017): Management and financing of e-Government projects in India: Does financing strategy add value?. *IIMB Management Review*, 29 (2), 90-108. DOI:

10.1016/j.iimb.2017.04.002

Olah, J., Virglerova, Z., Popp, J., Kliestikova, J., Kovacs, S. (2019): The Assessment of Non-Financial Risk Sources of SMES in the V4 Countries and Serbia. *Sustainability*, 11(17), 4806. doi:10.3390/su11174806

Osborne, S., Brown, L. (2011): Innovation, public policy and public services delivery in the UK. The word that would be king?. *Public Administration*, 89(4), 1335–1350.

Panopoulou, E., Tambouris, E., and Tarabanis, K. (2010): E participation initiatives in Europe: Learning from practitioners. In E. Tambouris, A. Macintosh, and O. Glassey (Eds.): ePart 2010, LNCS 6229, pp. 54–65, 2010. © IFIP International Federation for Information Processing 2010. *Electronic participation, lecture notes in computer science 6229*: 54–65.

Panopoulou, E., Tambouris, E., and Tarabanis, K. (2014): Success factors in designing eParticipation initiatives. *Information and Organization*, 24, 195–213.

Parasuraman, A. (1994a): Alternative scales for measuring service quality: A comparative assessment based on psychometric and diagnostic criteria. *Journal of Retailing*, 70 (3), 201–230. doi:10.1016/0022-4359(94)90033-7

Parasuraman, A. (2000): Technology Readiness Index (Tri). *Journal of Service Research*, 2(4), 307–320. doi:10.1177/109467050024001

Parasuraman, A., Berry, L. L., Zeithaml, V. A. (1991): Refinement and Reassessment of the SERVQUAL Scale. *Journal of Retailing*, 67(4), 420- 450.

Parasuraman, A., Berry, L. L., Zeithaml, V. A. (1993): More on Improving Service Quality Measurement. *Journal of Retailing*, 69 (1), 140-147. DOI: 10.1016/S0022-4359(05)80007-7

Parasuraman, A., Zeithaml, V. A., Berry, L. L. (1985): A Conceptual Model of Service Quality and Its Implications for Future Research. *Journal of Marketing*, 49 (4), 41. doi:10.2307/1251430

Parasuraman, A., Zeithaml, V. A., Berry, L. L. (1988): SERVQUAL: A Multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12- 37.

Parasuraman, A., Zeithaml, V. A., Berry, L. L. (1994): Reassessment of Expectations as a Comparison Standard in Measuring Service Quality: Implications for Further Research. *Journal of Marketing*, 58(1), 111. doi:10.2307/1252255

Parasuraman, A., Zeithaml, V. A., Malhotra, A. (2005): E-S-QUAL a multiple-item scale for assessing electronic service quality. *Journal of Service Research*, 7(3), 213–233.

Pardo, T. A., Nam, T., and Burke, G. B. (2011): E-Government Interoperability: Interaction of Policy, Management, and Technology Dimensions. *Social Science Computer Review*, 30(1), 7–23. doi:10.1177/0894439310392184

Parent, M., Vandebeek, C. A. and Gemino, A. C. (2005): Building citizen trust through e-government. *Government Information Quarterly*, 22(4), 720–736.

- Paroski, M., Konjovic, Z., Surla, D. (2013): Implementation of e-Government at the local level in underdeveloped countries. The case study of AP Vojvodina. *The Electronic Library*, 31(1), 99-118. DOI 10.1108/02640471311299164.
- Pavlou, P. (2003): Consumer Acceptance of Electronic Commerce: Integrating Trust and Risk with the Technology Acceptance Model. *International Journal of Electronic Commerce*, 7(3), 101–134. doi:10.1080/10864415.2003.1104427
- Phang, C. W., Sutanto, J., Li, Y., and Kankanhalli, A. (2005): Senior citizens' adoption of e-government: In quest of the antecedents of perceived usefulness. *Proceedings of the 38th Hawaii International Conference on System Sciences*, 5 (pp. 130a).
- Pilling, D., Boeltzig, H. (2007): Moving toward e-government: effective strategies for increasing access and use of the internet among non-internet users in the US and UK. *The Proceedings of the 8th Annual International Digital Government Research Conference*, pp. 35-46.
- Pires, G., Stanton, J., and Eckford, A. (2004): Influences on the perceived risk of purchasing online, *Journal of Consumer Behaviour*, 4(2), 118-131.
- Ranganathan, C., and Ganapathy, S. (2002): Key dimensions of business to consumer websites. *Information and Management*, 39, 457–465.
- Rashman, L., Withers, E. and Hartley, J. (2009): Organizational learning and knowledge in public service organizations: A systematic review of the literature. *International Journal of Management Reviews*, 11(4), 463–494. doi: 10.1111/j.1468-2370.2009.00257.x.
- Reddick, C. and Norris, D. F. (2013): E-participation in local governments: An examination of political-managerial support and impacts. *Transforming Government: People, Process and Policy*, 7(4), 453–476.
- Roblek, V., Bach, M.P., Meško, M., Bertonecel, T. (2020): Best Practices of the Social Innovations in the Framework of the E-Government Evolution. *Amfiteatru Economic*, 22 (53), 275-302.
- Rokhman, A. (2011): Potential Users and Critical Success Factors of E-Government Services: The Case of Indonesia. *Proceedings of the International Conference on Public Organization*, Yogyakarta. 21-22 January 2011. 231-244.
- Rubaii- Barrett, N., and Wise, L. R. (2008): Disability Access and E-Government: An Empirical Analysis of State Practices. *Journal of Disability Policy Studies*, 19(1), 52- 64. <https://doi.org/10.1177/1044207307311533>
- Sakowicz, M. (2007): How to evaluate e-government? Different methodologies and methods <http://unpan1.un.org/intradoc/groups/public/documents/NISPAce/ UNPAN009486.pdf>.
- Salloum., Al-Emran., Shaalan and Tarhini. (2019): Factors affecting the E-learning acceptance: A case study from UAE. *Education and Information Technologies*, 24(1), 509–530. <https://doi.org/10.1007/s10639-018-9786-3>.
- Sang, S., Lee, J., Lee, J. (2009): A Study on the Contribution Factors and Challenges to the Implementation of E-Government in Cambodia. *Journal of Software*, 4(6), 529-535.

<http://dx.doi.org/10.4304/jsw.4.6.529-535>.

Sarantis, D., Smithson, S., Charalabidis, Y., Askounis, D. (2010): A critical assessment of project management methods with respect to electronic government implementation challenges. *Systemic Practice and Action Research*, 23, 301–321.

Saugata, B., and Masud, R.R. (2007): Implementing E-Governance Using OECD Model (Modified) and Gartner Model (Modified) Upon Agriculture of Bangladesh. *Conference Paper*. 1-4244-1551-9/07/\$25.00 ©2007 IEEE. DOI: 10.1109/ICCITECHN.2007.4579410. Source: IEEE Xplore.

Saunders, M., Lewis, P. and Thornhill, A. (2003): *Research methods for business students*, (3rd edition). Harlow, Prentice Hall.

Schaupp, L. C. and Belanger, F. (2005): A conjoint analysis of online consumer satisfaction. *Journal of Electronic Commerce Research*, 6(2), 95–111.

Shankar, V., Smith, A and Rangaswamy, A. (2003): Customer satisfaction and loyalty in online and offline environments. *International Journal of Research in Marketing*, 20(2), 153-175.

Shareef, M. A., Baabdullah, A., Dutta, S., Kumar, V., Dwivedi, Y. K. (2018): Consumer adoption of mobile banking services: An empirical examination of factors according to adoption stages. *Journal of Retailing and Consumer Services*, 43, 54–67. doi:10.1016/j.jretconser.2018.03.003

Shareef, M. A., Kumar, V., Kumar, U., Dwivedi, Y. K. (2011): e-Government Adoption Model (GAM): Differing service maturity levels. *Government Information Quarterly*, 28(1), 17–35. doi:10.1016/j.giq.2010.05.006

Shi, S., Mu, R., Lin, L., Chen, Y., Kou, G., Chen, X.J. (2018): The impact of perceived online service quality on swift guanxi: Implications for customer repurchase intention. *Internet Res*, 28(3), 432–455. DOI: 10.1108/IntR-12-2016-0389.

Shih, H.- P. (2004): *An empirical study on predicting user acceptance of e- shopping on the Web*. *Information & Management*, 41(3), 351- 368. doi: 10.1016/s0378-7206(03)00079-x

Shin, D.- H. (2007): *A critique of Korean National Information Strategy: Case of national information infrastructures*. *Government Information Quarterly*, 24(3), 624- 645. doi: 10.1016/j.giq.2006.06.011

Sitenko, D., Vasa, L. (2018): The projects of the Industrialization Map as the main tool of implementation of the program of industrial and innovative development of Kazakhstan. *International Journal of Economics and Project Management*, 1(2),43- 51.

Simonofski, A., Zuiderwijk, A., Clarinval, A., Hammedi, W. (2022): Tailoring open government data portals for lay citizens: A gamification theory approach. *International Journal of Information Management*, 65, 102511, ISSN 0268-4012. doi: 10.1016/j.ijinfomgt.2022.102511.

Singh, H., Kar, A.K., Vigneswara Ilavarasan, P. (2019): *Adoption of e-Government Services: A Case Study on e-Filing System of Income Tax Department of India*. In: Tripathy, A., Subudhi, R., Patnaik, S., Nayak, J. (eds) *Operations Research in Development Sector*. Asset Analytics.

Springer, Singapore. https://doi.org/10.1007/978-981-13-1954-9_8

Standish Group Report. (2009): Chaos summary report. © 2014 Project Smart. The Standish Group.

Susha, I., and Gronlund, Å. (2014): Context clues for the stall of the Citizens' initiative: Lessons for opening up e-participation development practice. *Government Information Quarterly*, 31, 454–465.

Tilley, J., Neundorf, A., Hobolt, S. B. (2018): *When the Pound in People's Pocket Matters: How Changes to Personal Financial Circumstances Affect Party Choice*. *The Journal of Politics*, 80(2), 555–569. doi:10.1086/694549

Toots, M. (2019): Why E-participation systems fail: The case of Estonia's Osale.ee. *Government Information Quarterly*. 36(3), 546-559. Elsevier Inc. <https://doi.org/10.1016/j.giq.2019.02.002>

Torkzadeh, G and Dhillon, G. (2002): Measuring Factors that Influence the Success of Internet Commerce. *Information Systems Research*, 13(2), 187-204.

Toth, R., Ponusz, M., Kozma, T. (2018): Changing the strategy and business model of enterprises today: trends and manifestations of this trade in supply chains. *Logistics Trends and Best Practices (ISSN: 2416-0555)*, October 2018, Issue 2, 10-15. <https://doi.org/10.21405/LOGTREND.2018.4.2.10>

Trading Economics. (2020): website. Syria Literacy Rate. [Available online]: <https://tradingeconomics.com/syria/government-expenditure-on-primary-education-as-percent-of-gdp-percent-wb-data.html>. [Accessed, April 27th ,2020].

Tse, D and Wilton, P. (1988): Models of Consumer Satisfaction Formation: An Extension. *Journal of Marketing Research*, 25(2), 204-212.

Tung, L. L., Rieck, O. (2005): Adoption of electronic government services among business organizations in Singapore. *Journal of Strategic Information Systems*, 14, 417- 440.

Ubaldi, B. (2011): The impact of the Economic and Financial crisis on e-Government in OECD Member Countries. *European Journal of ePractice*. 11, 5- 18. [Available online]: <<https://joinup.ec.europa.eu/sites/default/files/document/2014-06/ePractice%20Journal-Vol.11-March%202011.pdf>> [Accessed, April 7th 2020].

Ueltschy, L. C., Krampf, R. F., & Yannopoulos, P. (2004): A Cross-National Study of Perceived Consumer Risk Towards Online (Internet) Purchasing. *Multinational Business Review*, 12(2), 59–82. doi:10.1108/1525383x200400010

Urban, G. L., Sultan, F. and Qualls, W. J. (2000): Placing trust at the center of your internet strategy. *Sloan Management Review*, 42(1), 39–48.

UNDESA. (2014): *E-government Survey, E-government for the Future We Want*. United Nations. 2014. ISBN: 978-92-1-123198-4. e-ISBN: 978-92-1-056425-0.

Undheim, T. A., Blakemore, M. (2007): *A Handbook for Citizen-centric e Government*. Prepared

for the e Government unit, DG Information Society and Media, European Commission. http://europa.eu.int/egovernment_research. [Available online]: <<https://ec.europa.eu/digital-single-market/en/news/handbook-citizen-centric-egovernment>> [Accessed, April 5th 2020].

UNDP Human Development reports. (2019b): Inequality in income index. [Available online]: <http://hdr.undp.org/en/indicators/101706#a>. [Accessed, April 24th ,2020].

United Nations and ASPA (American Society for Public Administration). (2001): *Benchmarking E-government: A Global Perspective*, [Available online]: <https://publicadministration.un.org/egovkb/en-us/Reports/Benchmarking-E-Government-2011>. [Accessed, April 24th, 2020].

United Nations (2008): *E-Government Survey 2008: From e-Government to Connected Governance*. New York: United Nations.

United Nations (2012a): Resolution adopted by the General Assembly on 27 July 2012, the future we want. A/RES/66/288.

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

United Nations (2014a): *E-Government Survey*. Online http://unpan3.un.org/egovkb/Portals/egovkb/Documents/un/2014_Survey/EGov_Complete_Survey-2014.pdf. [Accessed 19.01.2020].

United Nations. (2014b): *Manual for measuring e-Government*. United Nations Economic Commission for Africa. Addis Ababa, Ethiopia.

United Nations (2016a): Compendium of innovative practices in Public Governance and Administration for Sustainable Development. *United Nations Publication. 2016*. ISBN: 978-92-1-123206-6.

United Nations (2016b): *United Nations e-government survey 2016: E-government in support of sustainable development*. In U. Nations (Ed.). New York: Department of Economic and Social Affairs. United Nations.

United Nations (2018): *E-government survey 2018: Gearing e-government to support transformation towards sustainable and resilient societies*. United Nation department of economic and social affairs. United Nations New York. publicadministration.un.org.

United Nations. (2019): Country classifications. statistical annex. *World Economic Situation and Prospects 2019*, pp 167- 206.

Van Dijk, Jan A. G. M., Peters, O., and Ebbers, W. (2008): Explaining the acceptance and use of government internet services: A multivariate analysis of 2006 survey data in the Netherlands. *Government Information Quarterly*, 25(3), 379–399.

Vernadat. F.B. (2007): Interoperable Enterprise Systems: Principles, Concepts, and Methods. *Annual Reviews in Control*. 31(1),137-145. DOI: 10.1016/j.arcontrol.2007.03.004

Voorberg, W. H., Bekkers, V. J. J. M., Tummers, L. G. (2015): A systematic review of co-creation

and co-production: Embarking on the social innovation journey. *Public Management Review*, 17(9), 1333–1357.

Wagner, C., Cheung, K., Lee, F., Ip, R. (2003): Enhancing e-government in developing countries: Managing knowledge through virtual communities. *The Electronic Journal on Information Systems in Developing Countries*, 14(4), 1–20.

Waidner and Kasper (2016): Security in industrie 4.0: challenges and solutions for the fourth industrial revolution. Conference Paper. *Proceedings of the 2016 Conference on Design, Automation and Test in Europe*. Pages 1303–1308. DOI: 10.3850/9783981537079_1005.

Warkentin, M., D. Gefen, P. A. Pavlou and G. M. Rose (2002): Encouraging citizen adoption of e-government by building trust. *Electronic markets*, 12(3), 157-16. DOI: 10.1080/101967802320245929

Wang, Y.- S. (2003): The adoption of electronic tax filing systems: an empirical study. *Government Information Quarterly*, 20(4), 333- 352. doi: 10.1016/j.giq.2003.08.005

Wangpipatwong, S., Chutimaskul, W., Papasratorn, B. (2005): Factors influencing the adoption of Thai e-government websites: Information quality and system quality approach. *Proceedings of the fourth International Conference on eBusiness*, November 19–20, Bangkok, Thailand.

Weerakkody, V., Currie, W. (2003): Integrating business process reengineering with information systems development: Issues and implications. *Lecture Notes in Computer Science*, LNCS 2678, 302-320. Springer.

Weerakkody, V., Dhillon, G. (2008): Moving from E-Government to T-Government. *International Journal of Electronic Government Research*, 4, 1-16.

Weerakkody, V., El-Haddadeh, R. and Al-Shafi, S. (2011): Exploring the Complexities of E-Government Implementation and Diffusion in a Developing Country: Some lessons from the State of Qatar. *Journal of Enterprise Information Management*, 24(2), 172-196. <http://dx.doi.org/10.1108/17410391111106293>.

Weerakkody, V. Haddadeh, R. (2015): Exploring the complexities of e-government implementation and diffusion in a developing country: Some lessons from the State of Qatar. *Journal of Enterprise Information Management*, 24(2),172-196.

Weerakkody, V., Irani Z., Lee, H., Hindi, N. (2014): A Review of the Factors Affecting User Satisfaction in Electronic Government Services. *International Journal of Electronic Government Research*, 10(4), 21-56 · DOI: 10.4018/ijegr.2014100102.

Wescott, C.G. (2001): E-government in the Asia-pacific region. *Asian Journal of Political Science*. 9(2), 1–24. doi: 10.1080/02185370108434189

West, D.M. (2004): Equity and accessibility in e-Government: A policy perspective. *Journal of e-Government*, 1(2), 31-43.

Wihlborg, E. (2005): Offentliga e-tjänster i medborgarens tjänst (Public e-services serving the citizen), Stockholm: Finansdepartementet, Delegationen för 24timmarsmyndigheten.

Wolfenbarger, M., Gilly, M. C. (2003): *eTailQ: dimensionalising, measuring and predicting e tail quality. Journal of Retailing*, 79(3), 183- 198. doi:10.1016/s0022-4359(03)00034-4

Woolgar, S. (2002): Five Rules of Virtuality, in S. Woolgar (ed.), *Virtual Society? Technology, Cyberbole Reality*, Oxford University Press, Oxford, pp. 1–22. ISBN 978-0199248759.

World Bank. (2020): *The Fallout of War: The Regional Consequences of the Conflict in Syria*. Washington, DC: World Bank. doi:10.1596/978-1-4648-1614-7. License: Creative Commons Attribution CC BY 3.0 IGO

World Bank. (2022): *Syria Economic Monitor: Lost Generation of Syrians*. International Bank for Reconstruction and Development, Washington, DC: World Bank.

World Bank data website:
<https://data.worldbank.org/indicator/NY.GNP.MKTP.KD?end=2018&start=2007&view=chart>. [Accessed 06.02. 2020].

World Bank website. (2021a): World Development Indicators: Population dynamics. [Available online]: <http://wdi.worldbank.org/table/2.1>. [Accessed, February 25th ,2022].

World Bank website. (2021b). [Available online]:
<https://data.worldbank.org/indicator/SP.POP.TOTL?locations=SY>. [Accessed, February 4th ,2023].

World Bank. (2016): *World Development Report 2016: Digital Dividends*. Washington, DC: World Bank. doi:10.1596/978-1-4648-0671-1. License: Creative Commons Attribution CC BY 3.0 IGO

Yao, C., Liao, S. (2011): Measuring the antecedent effects of service cognition and internet shopping anxiety on consumer satisfaction with e-tailing service. *Management and Marketing*, 6(1), 59-78.

Yildiz, M. (2007): E-Government Research: Reviewing the literature, limitations, and ways forward. *Government Information Quarterly*, 24 (3), 646-665.

Yonazi, E., Kelly, T., Halewood, N. Blackman, C. (2012): *The Transformational Use of Information and Communication Technologies in Africa*. Report. World Bank, Washington, DC, and African Development Bank, Tunis. © World Bank. <https://openknowledge.worldbank.org/handle/10986/26791> License: CC BY 3.0 IGO.

Yoo, B., Donthu, N. (2001): Developing a scale to measure the perceived quality of an internet shopping site (SITEQUAL). *Quarterly Journal of Electronic Commerce*, 2(1), 31–46.

Yoo, B., Donthu, N. (2015): Developing a Scale to Measure the Perceived Quality of an Internet Shopping Site (PQISS). In: Spotts, H., Meadow, H. (eds) *Proceedings of the 2000 Academy of Marketing Science (AMS) Annual Conference. Developments in Marketing Science: Proceedings of the Academy of Marketing Science*. Springer, Cham. https://doi.org/10.1007/978-3-319-11885-7_129

Young, R., and Jordan, E. (2008): Top management support: Mantra or necessity? *International*

Journal for Project Management, 26 (2008), 713– 725.

Zeithaml, A., Parasuraman, A. and Malhotra, A. (2000), A Conceptual Framework for Understanding E-Service Quality: Implications for Future Research and Managerial Practice, *Marketing Science Institute*, Cambridge, MA.

Zheng, D., J. Chen, L. Huang and C. Zhang (2013): E-government adoption in public administration organizations: integrating institutional theory perspective and resource-based view. *European Journal of Information Systems*, 22(2), 221-234. <https://doi.org/10.1057/ejis.2012.28>

Zheng, Y. (2017): Explaining Citizens' E-participation usage: Functionality of E-participation applications. *Administration and Society*, 49(3), 423–442. First Published June 30, 2015. <https://doi.org/10.1177/0095399715593313>.

APPENDIX I RESULTS OF ONE-SAMPLE TEST

One-Sample Test for Social factors affecting Syrian e government implementation and Adoption

One-Sample Statistics				
	N	Mean	Std. Deviation	Std. Error Mean
PA.Overall	1005	2.806	1.0261	.0324
PESQ.Overall	1005	2.711	1.0111	.0319
Overall Attitude	1005	2.746	1.0469	.0330
PT.Overall	1005	2.925	1.2106	.0382
PR.overall	1005	3.627	.9282	.0293
PS.overall	1005	3.771	.8799	.0278
Overall Perceived Privacy	1005	2.896	1.0197	.0322
EgSAT.overall	1005	1.821	.6603	.0208
Overall Perceived Uncertainty (reversed coded)	1005	3.791	.9180	.0290
PU.overall	1005	3.886	.8711	.0275
Perceived Copatibility	1005	2.612	1.3496	.0426
ICTK.overall	1005	3.199	1.0373	.0327
Overall Perceived Ability to use ICT	1005	2.786	1.0837	.0342
Perceived Image of e government user	1005	3.706	.9138	.0288
Overall intention to use e government	1005	2.920	1.1085	.0350
Overall Citizens' Adoption of e government	1005	2.214	.8284	.0261
Overall Digital Divide	34	3.676	1.2240	.2099

One-Sample Test for Social factors affecting Syrian e government

Test Value = 3						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PA.Overall	5.994	1004	.000	.1940	.131	.258
PESQ.Overall	9.048	1004	.000	.2886	.226	.351
Overall Attitude	7.684	1004	.000	.2537	.189	.319
PT.Overall	1.954	1004	.051	.0746	.000	.150
PR.overall	21.409	1004	.000	.6269	.569	.684
PS.overall	27.783	1004	.000	.7711	.717	.826
Overall Perceived Privacy	3.248	1004	.001	.1045	.041	.168

EgSAT.overall	56.609	1004	.000	1.1791	1.138	1.220
Overall Perceived Uncertainty (reversed coded)	27.317	1004	.000	.7910	.734	.848
PU.overall	32.229	1004	.000	.8856	.832	.939
Perceived Copatibility	9.116	1004	.000	.3881	.305	.472
ICTK.overall	6.082	1004	.000	.1990	.135	.263
Overall Perceived Ability to use ICT	6.258	1004	.000	.2139	.147	.281
Perceived Image of e government user	24.508	1004	.000	.7065	.650	.763
Overall intention to use e government	2.277	1004	.023	-.0796	.011	.148
Overall Citizens' Adoption of e government	30.082	1004	.000	-.7861	.735	.837
Overall Digital Divide	3.223	33	.003	.6765	.249	1.104

One sample T Test for Syrian e government Perceived Service Quality Dimensions

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
PESQ.Efncy.Overall	1005	2.335	.8468	.0267
PESQ.SA.overall	1005	3.480	1.0133	.0320
PESQ.Fulmnt.Overall	1005	2.223	.9405	.0297
PESQ.PPsq.Overall	1005	3.124	1.1764	.0371
PESQ.Syscntnt.Overall	1005	2.395	.8916	.0281
PESQ.Overall	1005	2.711	1.0111	.0319

One-Sample Test for Perceived Service Quality dimensions

	t	df	Sig. (2-tailed)	Test Value = 3		
				Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
PESQ.Efncy.Overall	24.883	1004	.000	.6647	.612	.717
PESQ.SA.overall	15.005	1004	.000	.4796	.417	.542
PESQ.Fulmnt.Overall	26.195	1004	.000	.7771	.719	.835
PESQ.PPsq.Overall	3.352	1004	.001	.1244	.052	.197
PESQ.Syscntnt.Overall	21.510	1004	.000	.6050	.550	.660
PESQ.Overall	9.048	1004	.000	.2886	.226	.351

One sample T Test for Syrian e government Perceived Trust Dimensions

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
Overall Perceived Trust in E government	1005	3.194	1.0837	.0342
Overall Perceived Trust in Government itself	1005	2.387	1.3052	.0412

One-Sample Test

	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Overall Perceived Trust in E government	5.676	1004	.000	.1940	.127	.261
Overall Perceived Trust in Government itself	14.887	1004	.000	.6129	.532	.694

APPENDIX II RESULTS OF PAIRED-SAMPLE TESTS

Paired Samples Test of Syrian e government Perceived Service Quality dimensions

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PESQ.Efncy.Overall - PESQ.SA.overall	1.1443	1.1256	.0355	1.0746	1.2140	32.227	1004	.000
Pair 2	PESQ.Efncy.Overall - PESQ.Fulmnt.Overall	.1124	.8805	.0278	.0579	.1669	4.048	1004	.000
Pair 3	PESQ.Efncy.Overall - PESQ.PPsq.Overall	.7891	1.2301	.0388	.7129	.8652	20.335	1004	.000
Pair 4	PESQ.Efncy.Overall - PESQ.Syscntnt.Overall	.0597	.7669	.0242	.0122	.1072	2.468	1004	.014
Pair 5	PESQ.SA.overall - PESQ.Fulmnt.Overall	1.2567	1.2496	.0394	1.1794	1.3341	31.882	1004	.000
Pair 6	PESQ.SA.overall - PESQ.PPsq.Overall	.3552	1.4429	.0455	.2659	.4445	7.805	1004	.000
Pair 7	PESQ.SA.overall - PESQ.Syscntnt.Overall	1.0846	.9939	.0314	1.0231	1.1461	34.594	1004	.000
Pair 8	PESQ.Fulmnt.Overall - PESQ.PPsq.Overall	.9015	1.4161	.0447	.8138	.9891	20.182	1004	.000
Pair 9	PESQ.Fulmnt.Overall - PESQ.Syscntnt.Overall	.1721	.9055	.0286	.1161	.2282	6.027	1004	.000
Pair 10	PESQ.PPsq.Overall - PESQ.Syscntnt.Overall	.7294	1.1919	.0376	.6556	.8031	19.399	1004	.000

Paired Samples Test of Perceived Trust dimensions in Syrian e government

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Overall Perceived Trust in E government - Overall Perceived Trust in Government itself	.8070	1.5845	.0500	.7089	.9050	16.146	1004	.000

Paired Samples Test of Perceived Privacy dimensions of Syrian e government websites

		Mean	Std. Deviation	Std. Error Mean	Paired Differences		t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Overall Perceived Privacy of Service quality, Same of PESQ.PP.Overall - Overall Perceived Privacy of Policy site clarity	.4279	1.1792	.0372	.3549	.5009	11.503	1004	.000

Paired Samples Test between Overall ICT Knowledge - Overall Perceived Ability to use ICT

		Mean	Std. Deviation	Std. Error Mean	Paired Differences		t	df	Sig. (2-tailed)
					95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Overall ICT Knowledge - Overall Perceived Ability to use ICT	.41294	.76894	.02426	.36534	.46053	17.024	1004	.000

APPENDIX III RESULTS OF INDEPENDENT-SAMPLE TESTS

Independent Samples Test to test difference between women and men intention to use e government

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Overall intention to use e government	Equal variances assumed	2.629	.105	-.681	1003	.496	-.0476	.0700	-.1849	.0897
	Equal variances not assumed			-.681	1001.185	.496	-.0476	.0699	-.1849	.0897

Independent Samples Test to test difference between 18-49 and 50-65 age groups intention to use e government

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Overall intention to use e government	Equal variances assumed	11.965	.001	.382	1003	.000	.04104	.10749	-.16989	.25198
	Equal variances not assumed			.435	169.958	.000	.04104	.09437	-.14524	.22733

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