Yemen E-government Research Landscape: An in-depth study on the trends of published research

Arwa Aleryani

Associate Prof, Independent Researcher
arwa.aleryani@gmail.com

Abstract: E-government research is receiving great attention on a global level. Some researchers tend to explore e-government research within a certain scope. The current study aimed in exploring e-government research in Yemen. The study resulted in finding 41 published studies. The study surveyed the goals and results of the published researches and discussed their progress. In addition, topics related to e-government research that were not studied in Yemen were identified. Finally, the study presented the necessary recommendations from the identified published papers, as well as the suggestions that were put forward in researches similar to the goal of current research.

Index Terms- Yemen, e-government, published research.

I. INTRODUCTION

Publications on e-government have risen rapidly in recent years. The literature review provides important insights into the evolution of e-government study over time, the assessment of which serves as the basis for guidance on this global trend for future inquiry (Sarantis, 2019). With the growing usage of information and communication technology (ICT) and its applications in public administration and in the political arena, the issue of e-government is becoming more significant. Governments are keen to reach out to their people and open partnerships with businesses to boost their operations and serve their communities better. As a result, e-government work is on the rise exponentially.

Research also showed the importance of e-government in countries that have suffered from conflicts and wars in the ability to continue e-government services without disruption provided the availability of electricity and the Internet (Khan, Moon, Zo, & Rho, 2012). It also proved its importance in the continuity of the lifeline in the event of the spread of epidemics as it is the situation in 2020 (Giray,2020 ; Olagbaju, Awosusi, & Shaib, 2020). Digitization will be a big support for SMEs in 2020 and with COVID 19 if they have a digital transformation in order to be able to compete intensively. Since SMEs are part of the digital economic environment, digital skills need to be developed and innovated so that enterprise sustainability can take place now and in the future (Winarsih, Indriastuti, Fuad, 2021). The COVID-19 pandemic is pushing governments and communities to turn to emerging technology for a short-term response to the epidemic, mid-term resolution of socio-economic consequences, and long-term reinventing of existing policies and resources (United Nations Division for Public Institutions and Digital Government, 2020).

Publications on e-government have been gained many literature reviews worldwide. Several researchers have reviewed the published work on e-government worldwide (Heeks, 2001 ; Bolívar, Muñoz, & Hernández, 2010 ; Yildiz, 2012 ; Alcaide–Muñoz, Bolívar, Cobo, & Herrera–Viedma, 2017 ; Yusuf, Adams, & Dingley, 2016 ; Dombeu, Vincent, & Nelson, 2014). Some researchers are exploring a variety of subjects to expand their expertise in this field and create a theoretical foundation for this area (Abu-Shanab & Harb, 2019). Other researchers reviewing these studies in e-government literature and categorizing the results and identifying four research areas where the research community is targeting their efforts (Sarantis, 2019).

In the current study, the research trends on the e-government of Yemen have been examined to measure the volume of researches and the domains of the studies. In addition to figuring out what has been covered and what are the proposed future research directions. The author presented a narrative thematic review of what has been published in the field of e-government in Yemen and the related services between 2007 and 2020.

The researcher in the current study searched for the published papers in the field of e-government in Yemen and determined the number of researches that were carried out starting from 2007, the year in which the first study was found in this field, to the year 2020 and in which no research was found. The number of published research, which included doctoral and master's research, was 41 research. These researches were reviewed in a survey of the goal and results, and there were categorized into four domains, under each domain number of areas of e-government topics. Finally, the issues which were not studied are identified to deserve a future study.

By realizing the importance of e-government research in Yemen, the motivation for the current research was to explore e-government research in Yemen to know what has been accomplished and what has not been studied. This research can be a guideline that will enable researchers to explore the full landscape of e-government research in Yemen and move forward to add more to the e-government research in Yemen.

The research is organized into five sections. The first section is the literature review, following that, section two, which is the research methodology that will clarify the research mechanism that was carried out in this research and how the main areas of e-government research were identified. The third section is the result and discussion where the results will be presented and discussed, the fourth section is the conclusion. The final section is the recommendations.

II.   LITERATURE REVIEW

A.   E-government

E-government (short for electronic government) is the use of modern communications devices, such as computers and the internet, to provide public services in a country to citizens and other people. E-government provides new possibilities for easy citizen access to government and the delivery of services to people directly by the government. The term consists of the digital interactions between a citizen and their government (C2G), between governments and other government agencies (G2G), between government and citizens (G2C), between government and employees (G2E), and between government and businesses/commerce (G2B) (Jeong, 2007). E-governance involves the use of information and communication technologies (ICTs) to transact the business of government. At the level of service, e-governance promises a full service available 24 hours a day and seven days a week (Prasad, & Swain, 2009).

e-government in Yemen

The first attempt to build e-government in Yemen was announced in 2003 and its website was launched in the same year. However, the project was derailed in the absence of a change-inducing environment (ESCWA, 2007). Moreover, most of the available information systems lack technical compatibility and updated information (NIC, 2005 ; Alrewi 2007). The following e-government project was established in September 2008. The main aim in its first stage was to design the electronic information content of all the government organizations, taking into account daily updating. In this stage, the citizen would benefit from the e-government website in two different ways; the first way gets up-to-date information, the second way, enquires via e-mails (Aleryani, 2010). In 2014, the Yemen government decided to revive the E-government by 2014–2015; but many challenges stand on the way from achieving this goal (Al-Aghbari, Abu-ulbeh, Ibrahim, & Saeed, 2015). The recent research indicated that the Yemen E-government still in stage one (Catalog), Thus, e-government in Yemen needs to move to the next stage which is the transactions. Yemen still needs hard and fruitful work to reach the success that all its citizens can be touched (Atef, & Al Mutawkkil, 2019).

Domains of e-government Research

e-government research is a multidimensional subject that further covers many domains. Many studies (Heeks, 2001 ; Yildiz, 2012 ; Bolívar, M.P., Muñoz, & Hernández, 2010) pointed to the variety of the e-government research field. In general, e-government research is characterized as activities that assist and promote government initiatives in setting strategic tasks for the use of ITC. Many studies have employed approaches to empirical mapping to examine the thematic evolution of e-government science. Alcaide–Muñoz, Bolívar, M.P., Cobo, & Herrera–Viedma, (2017) combined several bibliometric tools to analyze the dynamics of research over 16 years to discover the most noticeable and high impact topics.

Six directions for e-government research were identified in an early study by Scholl (2007) as follows: government services, government operations, citizen engagement, public policy, technology utilization, and information use.

Yusuf, Adams, & Dingley, (2016) mentioned that the e-government research's themes are interrelated to each other and the multidisciplinary field. They identified themes and trends of e-government research based on selected conferences show the top ten keywords in ICEG papers from 2007 to 2010. They identified them as follows: (1) E-Democracy, (2) E-Governance, (3) E-Commerce, (4) E-Participation, (5) Governance, (6) E-Government implementation, (7) Public Sector, (8) E-Voting, (9) Public Policy, (10) Transparency.

Abu-Shanab & Harb (2019) reviewed the 2018 articles and revealed the dominant directions of current and future research. The study used frequency and clustering analytical techniques to classify the cluster of research topics seen in the period 2013 to 2016 as follows: social media, adoption, smart cities, engagement, open government, governance, website design, public administration, commerce.

Another latest study by Sarantis (2019), the author categorized e-government research's themes into three domains and twenty subdomains as follow:

Government: eGovernment Strategy-Policy, Organisation Role, eGovernment Framework, eGovernment Assessment, eGovernment Legal Framework, eGovernment Research Models.

Technology: Electronic Services, Back Office Infrastructure, Data, Social Media, Applications, Trust and Security, Channels, Interoperability

User: Stakeholder Interaction, User Participation, User Needs, User Role, Digital Inclusion, Impact.

The issue addressed in Dombeu, Vincent, & Nelson, (2014) study included: challenges and opportunities of e-government.

- The proposal of e-government strategies.
- e-government implementation.
- government websites.
- Models and frameworks for implementing e-government.
- The state of e-government, implication of e-government on public policy.
- Citizen roles and participation in e-government.
- The accessibility of e-government, services.
- Analysis of e-government readiness.
- The usage of ICTs in e-government implementation.

III.   RESEARCH METHODOLOGY

Al-Aghbari, Abu-ulbeh, Ibrahim, & Saeed (2015) aimed to choose related articles that studied the challenges, barriers, and issues in the context of e-government in Yemen. They reviewed e-government studies in Yemen by using a relevant set of keywords and phrases, such as electronic government, E-government, online services, information technology.

The search methods for e-government research in Yemen have been addressed to develop the best fit method for this research. Atef, & Al Mutawkkil, (2019) aimed to study the maturity of the e-government in Yemen. They searched in literature in leading journals and from international conferences about Yemen E-government. The authors made that by conduct a keyword and terms include "Yemen E-government" ,"E-government in Yemen" ,"e government in Yemen" ,"Yemen e government", "Yemen E-government adoption factors", "E-government in Yemen adoption factors". In addition, they searched for literature in a scientific database like google scholar, an Elsevier (Science Direct), ACM(Digital library), JSTOR , EBSCOhost, Wiley Online Library, Emerald , and IGI Global (IGI Global Journal & Database).

Search strategy

The search strategy adopted in the current study was done by searching the published works about e-government in Yemen. The search strategy was designed by combining Boolean operators and key terms in keywords and/or titles. The author extensively searched for conference proceedings, published journals articles, Master dissertations and Doctorate theses published online in English from the year 2007 to 2020. Table no. 1 shows the search strategy of the current study.

Table no. 1: Search strategy	
Period: May to August 2020	
First round in keywords AND/OR title	**Accessible web search engine**
e-government AND Yemen	Google Scholar, Science Direct, an Elsevier, Scopus, IEEE Xplore, Google Chrome, Wiley Online Library, IGI Global, ResearchGate, and references in identified studies.
digital government AND Yemen	
electronic government AND Yemen	
e-governance AND Yemen	
Second round in keywords AND/OR title	
Internet AND government AND Yemen	
Information technology AND government AND Yemen	
e-services AND/OR e-business, e-commerce, AND Yemen	
e-participation AND Yemen	

Research objectives

e-government is a very vital tool for effective services. Furthermore, it could serve as the best way to provide services during unusual times in the country including war and crises.

The current research aims first to examine the number of published works on e-government in Yemen from 2007 to 2020. It specifically aims to explore the number of publications work have done each year, in addition to the number of publications under each determined domain during this period.

The second aim is to investigate the objectives of published studies about e-government in Yemen and find out the main results that were reached by surveying abstracts, introduction, and conclusions. The survey results were organized in chronological order under each domain to give an overview of the developments in each domain.

This extensive analysis of the previously published work will result in determining the research domains that have not been tackled in the Yemen e-government compared to what was done in e-government studies in other countries (Yusuf, Adams, & Dingley, 2016) , (Abu-Shanab and Harb, 2019, Sarantis, 2019).

Research Questions

The current study provided an overview of e-government research in Yemen. The main questions are as follows:
1. What is the volume of published research in the field of e-government in Yemen from 2007 to 2020?
2. What are the main achievements of the published works on e-government in Yemen under each identified domain?
3. What topics are still needed to be investigated and studied?

Contribution to the knowledge

From reviewing and exploring the published works on e-government in Yemen, the current research is the first one for this purpose. It represents a contribution to knowledge, where it gives a clear vision of what has been accomplished and what remained unexplored and/ or needs further investigations. Moreover, determine the volume of the published works in e-government in Yemen, for the purpose of statistical studies. This research could serve as a guideline for researchers to build their new research proposals based on knowing what has been done and what needs further exploration to rich the e-government studies and avoid repetition.

IV.   RESULTS, ANALYSIS AND DISCUSSION

The results and discussion part is divided into two parts. The first part aims to determine the volume of published studies each year from 2007 to 2020 and to list their characteristics regarding the keywords. While the second part aims to survey of publications regarding their goal, abstracts, and conclusion. Finally, the topics that still need research and study will be determined.

The volume of published studies from 2007 to 2020
First step
In the first step, the explore was based on the compound of two words (e-government + Yemen) in the title AND /OR keywords and that resulted in 17 research as shown in table no. 1.

Table no. 1: Research-based on two words (Yemen + e-government) in the title AND/OR keywords				
NO	Author/s	Title	published Year	Keywords
1	Alsohybe, (2007)	The Implementation of E-Government In The Republic of Yemen: An Empirical Evaluation Of The Technical And Organizational Readiness	2007 Ph.D.	e-readiness , implementation, challenges
2	Al-eryani, (2009)	E-Government Services In Yemen: Success And Failure Factors	2009	E-services, E-government, Failure Factors, Success Factors, Yemen
3	Al-Hagery, (2010)	Basic Criteria for the Purpose of	2010	e-Government, Technological

		Applying E-Government in the Republic of Yemen		reality and information in Yemen, Challenges of e-Government in Yemen, application criteria of e-Government
4	Al-eryani, (2010)	A Model to Measure The Impact of Culture on E-Readiness for E-Government in Yemen	2010 – Ph.D.	Cultural elements, e-government, e-readiness, Model, Yemen
5	Amer, (2011).	Requirement Identification for the Development of Information Security Readiness Indicators for the Implementation of E-government in Yemen.	2011-Ph.D.	Not found
6	Al-eryani, & Rashed, (2012)	The Impact of the culture on the e-readiness for e- government in developing countries (Yemen),	2012	Cultural elements, e-government, e-readiness, Yemen
7	Al-wazir, & Zheng, (2012)	E-government Development in Yemen: Assessment and Solutions	2012	E-Government Development Index, Human Capital Index, Least Developed Countries, Online Services Index, Telecommunication Infrastructure Index, Yemen.
8	Al-hashmi, & Suresha (2013)	Evaluating the Awareness of E-government in the Republic of Yemen	2013	E-government, Awareness, Yemen, demographic variables
9	Al-haimi, Dahlan, & Hujainah, (2014)	The Requirements Towards the Development of the E-government Service Model in Improving E-services for Ministry of Higher Education and Scientific Research in Yemen	2014	E-government; E-services; E-government Service Model; MoHESR, Yemen
10	Al-wazir, and Zheng, (2014)	Factors Influencing E-government Implementation in Least Developed Countries: A Case Study of Yemen.	2014	Adoption, external assistance, least developed countries, portal websites, Yemen
11	Al-Aghbari, Abu-ulbeh, Ibrahim, & Saeed, (2015)	The Readiness and Limitations of E-Government in Yemen	2015	E-Government; E-Readiness; E-Government Challenges
12	Al-Wali, (2015)	E-Governance and its Impact on the Government Performance and the Reduction of Financial and Administrative Corruption in Yemen,	2015 Msc	Yemeni e-Government, e-Governance, e-Government adoption, ICT, information society, e-Services
13	Almutawkkil, Alsohybe, Al-shaibany, & Algabri, (2016)	The Development of Electronic Commerce Services (G2C) by the Government of Yemen: Investigating Barriers and Suggesting Solutions	2016	E-Government, G2C, Yemen, eRial.
14	Garad, Suyoto, & Santoso, (2017)	Analysis and Design of Cloud Computing for E-government in Yemen	2017	Cloud Computing, e-government; Information Technology, Analysis and Design e-government, e-government of Yemen.
15	Alhammadi, (2018)	E-Government as an Anti-Corruption Tool in Yemen:	2018	Corruption, ICT, E-government, Combating Corruption,

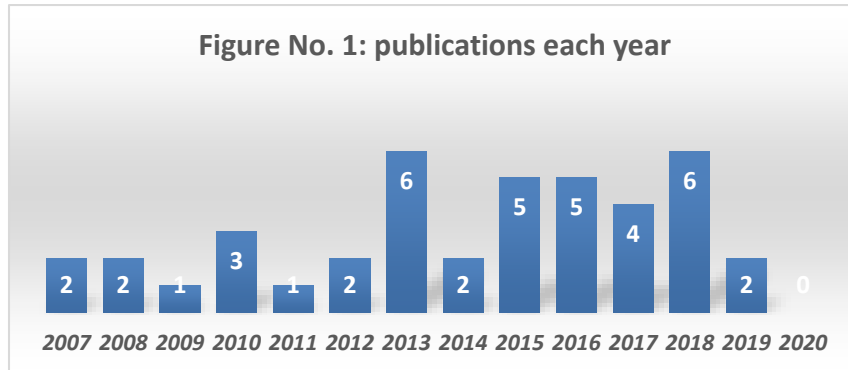|		Citizens' Perspective		economic growth, Yemen
16	Alhammadi, and Alhadramy, (2018)	The Role of E-government in Combating Corruption in the Public Sector in Yemen	2018	Corruption, ICT, E-Government, Combating Corruption, Monopoly Power, Discretion, Transparency, Yemen.
17	Atef, and Al Mutawkkil, (2019)	E-government Maturity Model: Developing Countries (Yemen)	2019	Yemen; E-government ; maturity models; stages, transaction

Second step

The second step of searching was based on the words (Yemen + e-service) in the title AND /OR keywords. e-service word was exchanged with the words: e-banking, e-commerce, e-learning, e-readiness. More search was on the keywords (Yemen + internet AND/ OR websites) in the title AND /OR keywords, furthermore, the investigation was done to ensure their aims are toward e-government services in Yemen. The final search was based on the keywords (Yemen + ICT) in the title AND /OR keywords, this research was also investigated to ensure their aim is toward e-government services. The result was 24 research as shown in table no. 2. That means the total of the volume of the published works is 41.

Table no. 2: published words based on the words (Yemen +(e-services AND / OR internet, websites), (Yemen + ICT)				
NO	Author/s	Title	Year published	Keywords
1	Zolait, Sulaiman, & Alwi, (2007)	Internet Banking Adoption In Yemen: An evaluation of Banks' Websites	2007	Internet Banking, Bank Websites Evaluation, Yemen
2	Al-eryani, Rashed, & Abu Shama, (2008)	The Impact of the Culture and Social Customs on the E-readiness in Yemen.	2008	Culture, E-readiness, Social Customs, Yemen.
3	Zolait, Sulaiman, & Alwi, (2008)	Prospective and challenges of internet banking in Yemen: an analysis of bank websites	2008	Internet Banking, IB, bank websites evaluation, developing countries.
4	Zolait, Ibrahim, & Farooq, (2010)	A study on the Internet Security and its Implication for E-commerce in Yemen	2010	E-Commerce, Information Technology, Internet, Internet Security, Yemen
5	Al-Ajam, and Nor, (2013a)	Adoption of Internet Banking by Yemeni Consumers: An Empirical Investigation	2013	Internet banking, Technology acceptance, Innovation diffusion theory, Structural equation modelling
6	Al-Ajam, & Nor, (2013b)	Customers' Adoption of Internet Banking Service: An Empirical Examination of the Theory of Planned Behavior in Yemen	2013	Internet banking, Consumer behavior, Theory of planned behavior, Structural equation modelling.
7	Alawi, & Nasreen, (2013)	Impact of E-Learning and Information and Communication Technology (ICT) on Learning in Taiz University	2013	E-Learning, ICT, Structural Equation Modelling, Learning
8	Al-Ajam, & Nor, (2013c)	Predicting Internet Banking adoption Determination in Yemen using Extended Theory of Reasoned Action	2013	Internet banking, Theory of reasoned action, begavioral intention, structural equation Modelling, norms
9	Rashed, Santos, & Al-Eryani, (2013)	Determinants of behavioral intention to mobile banking: Case from Yemen.	2013	Technology acceptance models, Mobile Banking, Arabic culture.

10	Al-eryani, & Alaraki, (2015)	Banking e-services Requirements in Yemen	2015	e-services, requirements, banking
11	Aldowah, Ghazal, & Muniandy, (2015)	Issues and Challenges of using E-Learning in a Yemeni Public University	2015	E-Learning, Public University, Yemen
12	Al-Fadhli, Othman, Rashed, & Ramasamy, (2015)	Telehealth in Yemen: An Overview and A Proposed Model	2015	National dialogue conference, healthcare, ICT
13	Abdullah, White, & Thomas, (2016a)	Conceptualising a New Stage Model of Electronic Business Adoption in Yemeni SMEs	2016	Stage model, e-business, Yemen, SMEs
14	Abdullah, Thomas, & Metcalfe, (2016b)	Measuring the e-business Activities of SMEs in YEMEN	2016	e-Business, e-commerce, Measurement Evolution Model, SMEs and Yemen.
15	Isaac, Abdullah, Ramayah, Mutahar, & Alrajawy, (2016)	Perceived Usefulness, Perceived Ease of Use, Perceived Compatibility, and Net Benefits: an empirical study of internet usage among employees in Yemen	2016	Net benefits, internet usage, perceived compatibility, TAM, Yemen
16	Alrajawy, Daud, Isaac, & Mutahar, (2016)	Mobile Learning in Yemen Public Universities: Factors Influence student's Intention to Use	2016	Mobile Learning, Subjective norms, Self-efficacy, TAM
17	Isaac, Abdullah, & Mutahar, (2017)	Internet Usage within Government Institutions in Yemen: An Extended Technology Acceptance Model (Tam) with Internet Self-Efficacy and Performance Impact	2017	Internet usage, Performance impact, Internet self-efficacy, TAM, Yemen
18	Al-Absi, Peneva & Yordzhev, (2017)	Student's Readiness for E-learning in the Universities in Yemen	2017	Information technology; higher education; e-learning; questionnaire research
19	Alragawi, & Zahary, (2017)	Obstacles and Opportunities for Yemeni Students to Use Mobile Learning	2017	Mobile learning (M-learning), Electronic learning (E-learning), Information and Communication Technology (ICT), distance learning, Smart phone
20	Alragawi, & Zahary, (2018)	The acceptance of Moodle Mobile in Smartphones - Case Study – Al-Andalus University	2018	Mobile learning (M-learning), Learning Manage.
21	Aldholay, Abdullah, Ramayah, Isaac, &Mutahar, (2018)	Online learning usage and performance among students within public universities in Yemen	2018	online learning, DeLone & McLean DMISM, DeLone & McLean information system success model, performance, higher education, Yemen.
22	Isaac, Abdullah, Ramayah, & Mutahar, (2018)	Factors determining user satisfaction of internet usage among public sector employees in Yemen	2018	internet usage; user satisfaction; diffusion of innovation; DOI; Yemen.
23	Ashbi, (2018)	Mobile Banking adoption in Yemen- An empirical study using Unified Theory of	2018 Master	Mobile Banking, Yemen, Unified Theory of Acceptance and Use of Technology, Adoption of

		Acceptance and Use of Technology (UTAUT)		technology
24	Thabit, Alhomdy, & Jagtap, (2019)	Toward a model for cloud computing banking in Yemen	2019	cloud computing, banking management, on-demand services, scalable infrastructure, cloud computing banking, Yemeni banks

The number of publications per year

Figure No. 1: publications each year

According to figure no.1, the attention started to grow up since 2013. On the other hand, 2019 showed a sharped decrease. In addition, no published work has been found until September 2020. However, the number of published research was low compared with other countries (Dombeu, Vincent, & Nelson, 2014).

Master's dissertations and Doctorate theses

In this study, only three Ph.D. theses have been found (Alsohybe, 2007; Al-eryani, 2010; Amer, 2011) and two Master dissertations (Ashbi, 2018 ; Al-Wali, 2015). This low number shows the lack of interest of doctoral and master's students in studying and examining the field of e-government, despite the multiplicity and importance of this field. We cannot conclude the reasons behind that, however, two main factors may be mentioned. The first factor the bad conditions that Yemen has been going through for a long time have made e-government a field far from the researchers' interest. The second factor is the government's failure to adopt a vision to support the existing e-government activities and try to guidance, postgraduate students, towards this field and motivate them to help the government overcome obstacles and the reasons behind the weakness of e-government applications that have been trying to exist since 2003. In addition, some of these research may not have been published through internet media, as a result, they were out of reach.

Domains of Yemen e-government published research

To build e-government research's domains for the current research, the author processed the keywords as follows:
The keywords have been listed as a data column given a total of 170, then the data column has been sorted and the duplicated words have been removed to come up with a total of 72 unique keywords. The classification has been made to the resulted unique keywords and four homogenous domains have been created as follows:
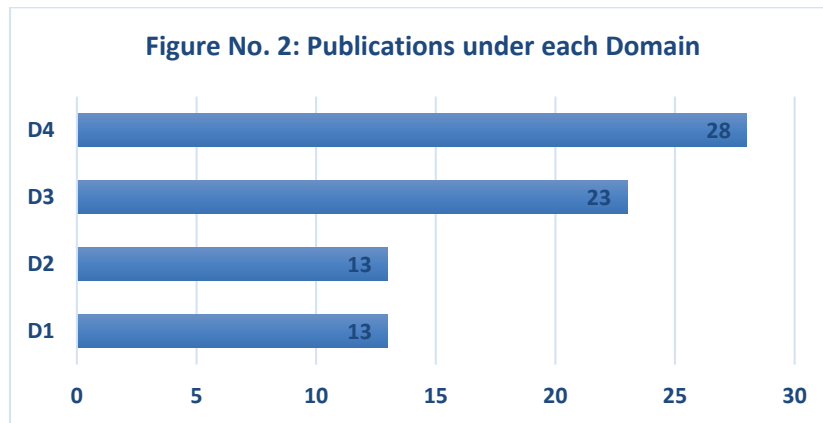
D1: e-government model.
D2: e-government implementation, infrastructure, and ICT.
D3: e-government readiness, awareness, adoption, and participation.
D4: e-government services, challenges, security, and transparency.

Finally, the publications have been distributed among the groups, taking into consideration the overlap of the interrelated objectives to each other and the multidisciplinary fields (Yusuf, Adams, & Dingley, 2016).

Review on e-government domains

The publications have been distributed among the domains shown in table no. 3 and figure no. 2.

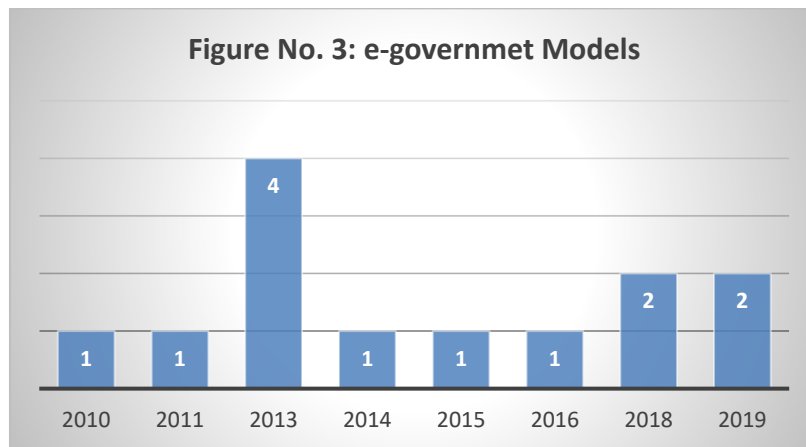| Table no. 3: The Publications and their Domains				
Research reference	D1	D2	D3	D4
Alsohybe, (2007)		✔	✔	
Al-eryani (2009)				✔
Al-Hagery, (2010)		✔		✔
Al-eryani, (2010)	✔		✔	
Amer, (2011)	✔		✔	
Al-eryani, & Rashed, (2012)			✔	
Al-wazir, and Zheng, (2012)		✔		✔
Al-hashmi, & Suresha (2013)			✔	
Al-haimi, Dahlan, & Hujainah, (2014)	✔			✔
Al-wazir, and Zheng, (2014)		✔	✔	
Al-Aghbari, Abu-ulbeh, Ibrahim, & Saeed, (2015)			✔	✔
Al-Wali, A. (2015)		✔	✔	
Almutawkkil, Alsohybe, Al-shaibany, & Algabri, (2016)				✔
Isaac, Abdullah, Ramayah, Mutahar, & Alrajawy, (2016)			✔	✔
Garad, Suyoto, & Santoso, (2017)		✔		
Alhammadi, (2018)			✔	✔
Alhammadi, & Alhadramy, (2018)			✔	✔
Atef, & Al Mutawkkil,(2019)	✔			✔
Zolait, Sulaiman, & Alwi, (2007)		✔		✔
Al-eryani, Rashed, & Abu Shama, (2008)			✔	
Zolait, Sulaiman, & Alwi, (2008)		✔		✔
Zolait, Ibrahim, & Farooq, (2010)		✔		✔
Al-Ajam, & Nor, (2013a)	✔		✔	✔
Alawi, & Nasreen, (2013)	✔	✔		✔
Al-Ajam, & Nor, (2013b)	✔		✔	✔
Al-Ajam, & Nor, (2013c)	✔		✔	✔
Rashed, Santos, & Al-Eryani, (2013)			✔	✔
Al-eryani, & Alaraki, (2015)			✔	✔
Aldowah, Ghazal, & Muniandy, (2015)				✔
Al-Fadhli, Othman, Rashed, & Ramasamy, (2015)	✔	✔		
Abdullah, Thomas, & Metcalfe, (2016a)	✔			✔
Abdullah, White, & Thomas, (2016b)				✔
Alrajawy, Daud, Isaac, & Mutahar, (2016)			✔	
Isaac, Abdullah, & Mutahar, (2017)		✔	✔	
Al-Absi, Peneva & Yordzhev, (2017)			✔	✔
Alragawi, & Zahary, (2017)			✔	✔
Alragawi, & Zahary, (2018)				✔
Aldholay, Abdullah, Ramayah, Isaac, &Mutahar, (2018)	✔			✔
Isaac, Abdullah, Ramayah, & Mutahar, (2018)	✔		✔	
Ashbi, (2018)			✔	✔
Thabit, Alhomdy, & Jagtap, (2019)	✔	✔		✔

Figure No. 2: Publications under each Domain

From the above figure, it can be summarized that domain No. 4 which is "e-government services, challenges, security, and transparency" was the highest studied domain. On the other hand, domain No. 3 which is "e-government readiness, awareness, adoption, and participation" got 19 published research, most of them were studying e-readiness for adopting. Moreover, domain No. 2 which is "e-government implementation, infrastructure, and ICT" is considered as one of the important domains in e-government research (Yusuf, Adams, & Dingley, 2016), however, only 13 published studies have been done based on it. Finally, domain No. 1 which is "e-government model and frameworks" had the lowest number of publications, where only 11 published research were in this domain.

The survey of the published works
1. **Review on e-government models (D1)**

To ensure the successful implementation of the e-government program, it requires building a model. That could be done guided by the steps of determining and analyzing each step, in order to ensure the achievement of the objectives of the e-government project (Lusta, 2017).

Figure No. 3: e-governmet Models

From figure No. 3, it can be concluded that only 13 published research have been done based on building model during the target period as mentioned above.

Many authors conducted studies based on creating models in the field of e-government in Yemen. Al-eryani A. (2010) built a model to measure e-readiness in e-government in Yemen. Amer, (2011) developed a mathematical model that provides a new approach for assessment security readiness in Yemen.

Al-Ajam, and Nor, (2013a) proposed model includes four dimensions of Innovation Diffusion Theory (IDT), which are covering the aspects of the most important issues of Internet banking. Following that, the authors (2013b) developed a model to predict and explain customer's behavioral intentions with regard to adopting Internet banking. Finally, they (2013c) proposed a structure model to examine the relationship between attitude, subjective norm, perceived behavioral control, and customer's intention to use internet banking service.

Alawi, and Nasreen, (2013) proposed a model, which explained the effect of ICT on e-learning. In addition, Al-haimi, Dahlan, & Hujainah, (2014) proposed an e-government service model in improving e-services for the ministry of higher education and scientific research.

Regarding e-health, only one study was found. Al-Fadhli, Othman, Rashed, & Ramasamy, (2015) proposed a high-level telehealth model that is peculiar to Yemen in terms of its existing health services, culture, geography, and ICT readiness. Abdullah, White, & Thomas, (2016a) created a conceptual model to critically evaluate the adoption of e-business activities as well as the factors that affect adoption in Yemeni SMEs.

Isaac, Abdullah, Ramayah, & Mutahar, (2018) developed an integrated conceptual model based the DeLone and McLean information systems success model (DMISM), the unified theory of acceptance and use of technology (UTAUT) and task-technology fit (TTF) to predict the user satisfaction of internet. In addition, Aldholay, Abdullah, Ramayah, Isaac, &Mutahar, (2018) extended the DeLone & McLean information system success model (DMISM) to create a comprehensive model that comprises five main antecedents.

In 2019, two models have been developed. Atef, and Al Mutawkkil, (2019) proposed a model to measure the maturity of the e-government in Yemen. Thabit, Alhomdy, & Jagtap, (2019) proposed a model for the cloud computing banking in Yemen.

2. Review on e-government implementation (D2)

ICT is a term used frequently by researchers to introduce the e-government umbrella, which included the coverage of communication in the form of Internet and web areas and computing. Such terms are used by researchers to cover the infrastructure supporting e-government status if offline or online (Abu-Shanab & Harb, 2019).

In early 2007, Alsohybe evaluated the technical and organizational readiness for e-government implementation. He identified the challenges facing the implementation process. In 2010 the criteria for the implementation of e-government in Yemen was studied by

The Al-Hagery' study (2010) resulted in the lack of infrastructure and disruption of the national economy's structure, limited resources, and reflection on existing information age components.

Al-wazir and Zheng (2012) studied the national project for information technology that has established the portal for e-government. They identified the main problems such as the portal contains many links to different organizations in the government, however, many links are not operational, and the contents are not up-to-date. In addition, for each ministry, there is a private website that was not linked to the portal. Due to such problems, Yemen has got a low point on the online service index.

Alawi, and Nasreen, (2013) examined the underlying relationships between e-learning and ICT promoting online higher education teaching; the findings showed that the use of e-learning and ICT techniques is becoming more common in higher education; and students make use of them mainly as a means of educational technology and research via internet.

In 2014, Al-wazir, and Zheng, studied the e-government implantation. The results showed the existence of ICT infrastructure (computers, network, database), as well as training, although that, this technology was not used in a large domain. The study showed that employees are using social networks more than using government portals or internal databases. This is due to a lack of leadership and managing technology. According to the authors, e-government implementation cannot be succeeded by providing only networks, training, software, and hardware, but government leaders should ensure using them by their employees.

The indicators of the current situation of ICT in Yemen are humbled and the efforts are concentrated to create a proper infrastructure and the formulation of policies and strategies as reported in Al-wali, (2015).

Almutawkkil, Alsohybe, Al-shaibany, & Algabri, (2016) studied the status of the electronic commerce services implemented by the public sector in Yemen. The results showed that the economy, the high illiteracy especially in rural areas, the mistrust between government agencies and citizens in using e-services, and the unavailability of appropriate legislation and policies are the main barriers to implement e-commerce.

Garad, Suyoto, & Santoso, (2017) analyzed the impact of using cloud computing in e-government and infrastructure required for it to be used in e-government in Yemen. The results showed that there are many challenges facing the implementations of using cloud computing in e-government. The main problems that face the development of e-government in Yemen are political stability, awareness of the importance of e-government, and lately, conflicts and wars. The reality of e-government in Yemen still has many problems and difficulties according to the authors.

Al-Fadhli, Othman, Rashed, & Ramasamy, (2015) attempted to find solutions to improve the quality of Yemen's healthcare services through telehealth technology. Various reforms are underway to improve the current health care indicators. ICT infrastructure needs to be assessed strategically for the successful implementation of telehealth in Yemen.

A recent study by Atef, and Al Mutawkkil, (2019) about the reality of Yemen e-government's situation and determines its maturity stage based on maturity models. Yemen e-government still in stage one (catalog). Thus, e-government in Yemen needs to move to the next stage which is the transactions. As a result, Yemen needs hard and fruitful work to reach a fruitful success that all its citizens can be touched.

3. Review on e-government readiness (D3)

e-readiness is one of the most important factors that has been addressing by researchers in the field of e-government. By assessing to which degree of cultural factors are present and effective in the society, that helps find a significant effect on the e-government readiness, adoption, participation, and awareness in using e-government (Sabri, 2012). From this researches, the government will be able to identify the weakness and strength points to manage the e-government projects and will help to achieve the readiness required toward a successful implementation of the e-Government systems.

e-readiness has been investigated and addressed by many Yemeni authors. In 2008, Al-eryani, Rashed, & Abu Shama, (2008) investigated the impact of the culture and social customs on the e-readiness, the results showed that Yemen still far from making its citizens e-ready for the e-government services. On the other hand, in 2012 Al-eryani, and Rashed, (2012) studied the impact of the culture on the e-readiness of e-government in Yemen. The results of the survey at this time showed that there are some positive indicators for e-readiness in Yemen, these positive indicators were due to the starting of the existence of some government websites.

In 2008, Zolait, Sulaiman, & Alwi, (2008) measured the intendancy of banks in Yemen towards Internet banking adoption. This study concluded that the presence of some basic features in the Yemeni banks' web technology, which is very necessary but have still little use in the time of the research.

Rashed, Santos, & Al-Eryani, (2013) evaluated mobile banking regarding user acceptance, through the Technology Acceptance Model (TAM) in Yemen. The result showed the gap between accepts the new technology as an idea and the actual use of it.

Al-hashmi, and Suresha (2013) examined the awareness of e-government in Yemen, the results revealed a low awareness of the use of e-government in Yemen. Yemeni culture affects the participation in using e-government, especially, females, and this supported Aleryani (2010) study.

The study in 2014 showed that most of the government employees in Yemen do not sufficiently use the technology in their job (Al-wazir, and Zheng, 2014)

Al-Wali (2015) measured the impact of e-governance on the Yemeni government's performance and the reduction of corruption. He identified the readiness of Yemeni people towards the adoption of e-government. The results showed that Yemen has a combination of religious, social, economic, and political contradictions, which made the situation very complicated for adopting e-government. The study showed that the Yemeni people are not completely ready to adopt the e-Government due lacked the trust in the government.

Regarding e-learning readiness, Al-Absi, Peneva & Yordzhev, (2017) measured student's readiness for e-learning in Yemeni universities. The result showed that there are many problems such as lack of investment in physical assets; lack of qualified academic staff. This leads to reducing the student's readiness for e-learning. Alrajawy, Daud, Isaac, & Mutahar, (2016) investigated the impact of subjective norms and self-efficacy on the intention to use Mobile Learning among students in Yemen's public universities where the technology acceptance model (TAM) is used as an underpinning theory. The results recommended that the technology acceptance model (TAM) is a valid model that can be used to predict intention to use Mobile Learning among university students in Yemen. However, Yemeni students showed the ability to use the technology for learning (Alragawi, and Zahary, 2017 ; Alragawi, and Zahary, 2018).

Ashbi, 2018 studied the drivers, benefits, challenges, and the extent of using mobile-banking in Yemen. The general result showed that a big challenge faced by the bank is gaining the trust of customers and being able to provide a consistent and reliable service, especially in the current economic and political situation.

4.   Review on e-government services (D4)

E-government is defined in its simplest form as the use of ICT tools and applications to provide better services to citizens and businesses (Abu-Shanab & Harb, 2019) that includes other terms that attracted more research are security, privacy, and e-service.

Many researchers stressed the importance of the quality of the e-services to influence and gain customer value (Redda, and Surujlal, 2017).

Al-eryani A. (2009) used semi-structured interviews with top management in several e-government projects to evaluate the e-government services in Yemen and understand the success and failure factors. The failure factors that were identified were the ambiguous vision of the conceptual of the e-government, the absence of the readiness and awareness among the employees and the citizens. On the other hand, the success factor was tries to reduce the gap between the citizens and technology culture and skills.

The encryption technology still unfamiliar by most companies and banks and most companies do not use firewalls to protect the information assets that they possess as reported by Zolait, Ibrahim, & Farooq, (2010). However, in 2013 Al-Ajam, and Nor, (2013a) examined empirically the factors that affect the acceptance of Internet banking and the results showed several important implications for Internet banking adoption research and practice.

Al-Aghbari, Abu-ulbeh, Ibrahim, & Saeed, (2015) surveyed the challenges that hinder the growth of e-government services by reviewing e-government studies in Yemen and summarised the challenges by grouping them into three categories: the challenges of the

organization, technique, and adoption. More studies have been addressed the e-banking, for instance, Al-eryani, and Alaraki, (2015) investigated the availability of the essential requirements for e-banking adoption in Yemen. The results showed that the infrastructure requirements are the strongest points, on the other hand, requirements related to employees and clients are the weakest points.

In 2016, Abdullah, Thomas, & Metcalfe, (2016b) measured the e-business activities of SMEs in Yemen, the results indicated that the SMEs are at the early stages of e-business adoption. They studied the factors that affect adoption in Yemeni SMEs. The results described the current state of e-business adoption in Yemen SMEs through the e-business measurement evolution model, 50% of SMEs were "not started" stage while 57% were "email" stage, 78 percent, however, have social media and are using it to promote their products and services. Many SMAs have their own website and just 39 percent use e-commerce for purposes such as obtaining orders and managing them manually and accepting payment by bank transfer or cash.

Regard e-learning Aldowah, Ghazal, & Muniandy, (2015) identified and addressed the major issues and challenges faced by a public university in Yemen in establishing e-learning as a successful medium of imparting learning process. Results showed that all the obstacles could be categorized into five dimensions, which are human constraints, administrative constraints, technical constraints, financial and physical constraints.
Alhammadi, 2018 , Alhammadi, & Alhadramy, (2018) studied the relationship of e-government and corruption. The results of the research revealed that the use of ICT in the form of e-government could make important headway to reduce corruption.

V. RECOMMENDATIONS AND CONCLUSION

A. Recommendations

Future studies recommended by the identified studies

The areas that need extensive studies according to the recommendations of the researchers are as follow:
Al-Aghbari, Abu-ulbeh, Ibrahim, & Saeed, (2015) recommended studying more on challenges such as Internet cost and low income and IT literacy, awareness, trust, security, complexity, website design, and website content. In addition, Abdullah, Thomas, & Metcalfe, (2016b) recommended more investigation on the barriers and drivers that deter SMEs from adopting e-business was
Aldowah, Ghazal, & Muniandy, (2015) suggested many areas for the upcoming study, for instance, conduct a follow-up study on faculty members' uses of e-learning systems in learning and teaching at any public university in Yemen. Moreover, Al-Fadhli, Othman, Rashed, & Ramasamy, (2015) recommended more studies of the ICT developments in Yemen to cater for telehealth.

Future studies recommended by the international literature studies

There are some topics that researchers in the international literature have dealt with in the field of e-government that have not been studied within the e-government research in Yemen (Mahmoudzadeh, Zendeh, & Askarnia. 2015; Janom, and Zakaria, 2009; Aljarrah, Elrehail, & Aababneh, 2016 ; Yusuf, Adams, & Dingley, 2016, Scholl, 2007 , Abu-Shanab & Harb, 2019 , Sarantis, 2019, Cheng San, Choy Yee, Moorthy, & Lee. 2017) for instance, as follows:

- E-democracy.
- M-government.
- E-voting.
- E-government Legal Framework.
- Smart cities.
- E-payment.

Author Recommendations

For the same purpose of the current research, the author suggests a further study include the research that is written in Arabic and in foreign languages (other than English) if at least abstracts have been translated into Arabic. The author also recommends that all the researchers upload their Ph.D. and Master's theses to the proper internet location to be available to the researchers. Moreover, it is also recommended that attention be paid to future studies suggested in this study.

B. Conclusion

To summary that, it becomes clear the importance of e-government research and its necessity to provide the government with what are the requirements to implement more optimal and more effective e-services (Abu-Shanab and Harb, 2019 ; Sarantis, 2019 ; United Nations Division for Public Institutions and Digital Government 2020). Since the 2020 crisis has put public services under stress,

governments are urged to deploy effective digital technologies to contain the outbreak. This discovers the need for more research on e-government issues. Moreover, the crisis 2020 has exposed the need for government leadership in the development and adoption of new technologies to ensure an effective provision of public services (United Nations Division for Public Institutions and Digital Government 2020). It is responsible for the researchers to support the government in doing vital research to investigate the proper technology to be adopted.

Regarding e-government research in Yemen, the results of the research on e-government and its services are appreciated, where the 41 studies have covered important areas within e-government. The researchers reached good results that can be used and understood the reality of e-government in Yemen and its development. There is no doubt that the wars and crises that Yemen is going through have diminished interest in e-government research, and on the other hand, the lack of benefit from these research diminished the enthusiasm of the researchers to continue their research in the field of e-government.

Compare to the research landscape in other countries (Dombeu, Vincent, & Nelson, 2014) it appears that the e-government research landscape in Yemen needs more attention. In addition, the research should be linked to clear plans and targeted policies by the government to benefit from the researchers' work. It is recommended the need for researchers to work collectively to cover areas that deserve study.

Study limitation

The published papers that are subscription-based on pricing have not been included.

REFERENCES

[1] Abdullah, A., Thomas, B. and Metcalfe, S. (2016b). "Measuring the e-business Activities of SMEs in YEMEN", Asia Pacific Institute of Advanced Research (APIAR), Volume 2 , Issue 1.

[2] Abdullah, A., White, G. & Thomas, B. (2016a). "Conceptualising a New Stage Model of Electronic Business Adoption in Yemeni SMEs". The 39th Annual Conference of the Institute for Small Business and Entrepreneurship, October 26-27, Paris.

[3] Abu-Shanab, E., and Harb, H. (2019). "E-Government Research Insights: Text Mining Analysis", Electronic Commerce Research and Applications, 38 (2019) 100892

[4] Al-Absi, A. , Peneva, I. , Yordzhev, K. (2017). "Student's Readiness for E-learning in the Universities in Yemen, Science and Technology", Publishing (SCI & TECH) Vol. 1 Issue 8.

[5] Al-Aghbari, A. , Abu-ulbeh, W. , Ibrahim, O. & Saeed, F. (2015). "The Readiness and Limitations of E-Government in Yemen", Jurnal Teknologi (Sciences & Engineering) 73:1 (2015), 107–115.

[6] Al-Ajam, A. and Nor, K. (2013a). "Adoption of Internet Banking by Yemeni Consumers: An Empirical Investigation", Australian Journal of Basic and Applied Sciences, 7(2): 182-189.

[7] Al-Ajam, A. and Nor, K. (2013b). "Customers' Adoption of Internet Banking Service: An Empirical Examination of the Theory of Planned Behavior in Yemen", International Journal of Business and Commerce Vol. 2, No.5: [44-58]

[8] Al-Ajam, A. and Nor,K. (2013c). "Predicting Internet Banking adoption Determination in Yemen using Extended Theory of Reasoned Action", Research Journal of Applied Science 8 (5), 278-285.

[9] Alawi, G. and Nasreen, N. (2013). "Impact of E-Learning and Information and Communication Technology (ICT) on Learning in Taiz University", Multimedia Technology (MT) Volume 2 Issue 4, December 2013.

[10] Alcaide–Muñoz, L., PedroRodríguez–Bolívar, P., Cobo, J, & Herrera–Viedma, E. (2017). "Analysing the scientific evolution of e-Government using a science mapping approach". Government Information Quarterly. Vol. 34, Issue 3, September 2017, Pages 545-555.

[11] Aldholay, A. , Abdullah, Z., Ramayah, T., Isaac, O. & Mutahar, A. (2018). "Online learning usage and performance among students within public universities in Yemen", Int. J. Services and Standards, Vol. 12, No. 2, pp.163–179.

[12] Aldowah, A. , Ghazal, S. & Muniandy, B. (2015). "Issues and Challenges of using E-Learning in a Yemeni Public University", Indian Journal of Science and Technology, Vol 8(32).

[13] Al-eryani A. (2009). " E-government Services in Yemen: Success and Failure Factors". Faculty of Sciences Bulletin/ Sana'a University, Issue no. 22, pp.61-74.

[14] Al-eryani, A. (2010), "A Model to Measure The Impact of Culture on E-Readiness for E-Government in Yemen" Khartoum University, Ph.D.

[15] Al-eryani, A. , Rashed, A. & Abu Shama, H. (2008). "The Impact of the Culture and Social Customs on the E-readiness in Yemen". Science & Technology University. Scientific Journal, Vol. 14, Issue no.2 pp. 9-35.

[16] Al-eryani, A. and Rashed, A.(2012). "The Impact of the culture on the e-readiness for e- government in developing countries (Yemen)", The 13International Arabic Conference of Information Technology ACIT'2012 Dec. 10 - 13 Jordan.

[17] Al-eryani, A., Alaraki, S. (2015). "Banking e-services requirements in Yemen", Saba Journal of Information Technology and Networking, Vol. 3 no1.

[18] Al-Fadhli, A. , Othman, M. , Rashed, A. & Ramasamy, A. (2015). "Telehealth in Yemen: An Overview and A Proposed Model", Proceedings of the 5th International Conference on Computing and Informatics, ICOCI 2015, Istanbul, Turkey. Universiti Utara Malaysia.

[19] Al-Hagery, M. (2010). "Basic Criteria for the Purpose of Applying E-Government in the Republic of Yemen, International Journal of Research and Reviews in Computer Science, Vol. 1, No. 3, September 2010.

[20] Al-haimi, B, ; Dahlan, H. ; Hujainah, F. (2014), "The Requirements Towards the Development of the Egovernment Service Model in Improving E-services for Ministry of Higher Education and Scientific Research in Yemen", Journal of Information Systems Research and Innovation.

[21] Alhammadi, I. (2018). "E-Government as an Anti-Corruption Tool in Yemen: Citizens' Perspective", International Journal of Digital Information and Wireless Communications, 8(4): 239-252.

[22] Alhammadi, I. and Alhadramy, A. (2018). "The Role of E-government in Combating Corruption in the Public Sector in Yemen", Saba Journal of Information Technology and Networking, Vol. 6 no 1.

[23] Al-hashmi, A. and Suresha (2013). "Evaluating the Awareness of E-government in the Republic of Yemen", International Journal of Computer Applications (0975 – 8887) Volume 67– No.16.

[24] Aljarrah, E. , Elrehail, H. & Aababneh, B. (2016). "E-voting in Jordan: Assessing readiness and developing a system", Computers in Human Behavior.

[25] Almutawkkil, A. , Alsohybe, N. , Al-shaibany, N. & Algabri, M. (2016). "The Development of Electronic Commerce Services (G2C) by the Government of Yemen: Investigating Barriers and Suggesting Solutions", International Journal of Innovative Science, Engineering & Technology, Vol. 3 Issue 10.

[26] Alragawi, N. ' ; Zahary, A. (2018). "The acceptance of Moodle Mobile in Smartphones - Case Study – Al-Andalus University", Saba Journal of Information Technology and Networking, Vol .6 No.1

[27] Alragawi, N. ' and Zahary, A. (2017). "Obstacles and Opportunities for Yemeni Students to Use Mobile Learning", The International Journal of E-Learning and Educational Technologies in the Digital Media, 3(4): 161-173.

[28] Alrajawy, I. , Daud , N. , Isaac , O. & Mutahar, A. (2016). "Mobile Learning in Yemen Public Universities: Factors Influence student's Intention to Use", 7th International Conference on Postgraduate Education, pp. 1050–1064, Universiti Teknologi MARA (UiTM), Malaysia.

[29] Alrewi, Y. (2007). "The situation of the e-government project in Yemen", The 6th Conference on the e-government (The new management and the e-government), Dubai

[30] Alsohybe, N. (2007). "The Implementation of e-government in the Republic of Yemen: An Empirical Evaluation of the Technical and Organizational Readiness". Ph.D. thesis, Capella University.

[31] Al-Wali, A. (2015). "E-Governance and its Impact on the Government Performance and the Reduction of Financial and Administrative Corruption in Yemen", A Master's Project, Open University of Malaysia.

[32] Al-wazir, A. and Zheng, Z. (2014). "Factors Influencing E-government Implementation in Least Developed Countries: A Case Study of Yemen, Developing Country Studies", Vol.4, No.7.

[33] Al-wazir, A. and Zheng, Z. (2012). "E-government Development in Yemen: Assessment and Solutions". Journal of Emerging Trends in Computing and Information Sciences. vol. 3, no. 4.

[34] Amer, J. (2011). "Requirement Identification for the Development of Information Security Readiness Indicators for the Implementation of E-government in Yemen".   ST. Clements University, British West Indies, Ph.D.

[35] Ashbi, H. (2018). "Mobile Banking adoption in Yemen- An empirical study using Unified Theory of Acceptance and Use of Technology (UTAUT)", Maastricht School of Management (MSM), Masters.

[36] Atef, R. and Al Mutawkkil, A. (2019). "E-government Maturity Model: Developing Countries (Yemen), International Journal of Computer Science and Network, Volume 8, Issue 1.

[37] Bolívar, P., Muñoz, L.A., & Hernández, M. (2010). "Trends of e-Government Research. Contextualization and Research Opportunities", International Journal of Digital Accounting Research, 10(16): 87-111.

[38] Cheng San, A. , Choy Yee, J. , Moorthy, K. & Lee. A. (2017). "Intention to Use M-Government Services: Age, Gender and Education Really Matter?" INTERNATIONAL JOURNAL OF eBUSINESS AND eGOVERNMENT STUDIES Vol 9, No 2, 2017

[39] Dombeu, F. , Vincent, J. & Nelson, R. (2014). "African E-Government Research Landscape" The African Journal of Information Systems: Vol. 6 : Iss. 3 , Article 2.

[40] ESCWA (2003). "Regional Workshop on E-Government Yemen". Available via http://unpan1.un.org/intradoc/groups/public/documents/UNESCWA/UNPAN012167.pdf

[41] Garad, A. , Suyoto, & Santoso, J. (2017). "Analysis and Design of Cloud Computing for E-government in Yemen", International Journal of Computer Engineering and Information Technology (IJCEIT), Volume 9, Issue 8.

[42] Giray, G. (2020). "Global Evidence on the Determinants of Public Trust in Governments During the COVID-19 (2020)". CESifo Working Paper No. 8313.

[43] Heeks, R. (2001). "Understanding e-governance for development", Manchester, Institute for Development, Policy and Management Information, Systems, Technology, and Government: Working Papers Series, Number 11/2001.

[44] Int. J. Technological Learning, Innovation and Development, Vol. 10, No. 1, pp.37–68.

[45] Isaac, O. , Abdullah, Z. & Mutahar, T. (2017). " Internet Usage within Government Institutions in Yemen: An Extended Technology Acceptance Model (Tam) with Internet Self-Efficacy and Performance Impact" , Sci.Int.(Lahore), 29 (4), 737-747.

[46] Isaac, O , Abdullah, Z. , Ramayah, T. , Mutahar, A. & Alrajawy, I. (2016). "Perceived Usefulness, Perceived Ease of Use, Perceived Compatibility, and Net Benefits: an empirical study of internet usage among employees in Yemen",7th International Conference on Postgraduate Education, pp. 899–919, Universiti Teknologi MARA (UiTM), Malaysia.

[47] Isaac, O., Abdullah, Z., Ramayah, T. & Mutahar, A. (2018). "Factors determining user satisfaction of internet usage among public sector employees in Yemen", Int. J. Technological Learning, Innovation and Development, Vol. 10, No. 1.

[48] Janom,N. and Zakaria, M. (2009). "B2B E-commerce Readiness Assessment Indicators based on the Critical Success Factors", Proceeding of International Conference on Electrical Engineering and Informatics (ICEEI 2009) , August 5- 7, 2009, Bangi Selangor

[49] Jeong Chun Hai (2007). "Fundamental of Development Administration". Selangor: Scholar Press. ISBN 978-967-5-04508-0

[50] Khan, G. , Moon, J. , Zo, B. & Rho, J. (2012). "E-government service use intentions in Afghanistan: technology adoption and the digital divide in a war-torn country", Information Development, 28(4) 281–299

[51] Lusta, A. and Aktas, L. (2017). "The Five Models for E-Government", Imperial Journal of Interdisciplinary Research (IJIR). Vol-3, Issue-2.

[52] Mahmoudzadeh, M. , Zendeh, A. & Askarnia. M. (2015). "Identification and Ranking E-commerce Infrastructure E-Readiness Indicators", International Conference on Value Chain Sustainability. 12-13 March

[53] NIC (National Information Centre) (2005). E-government "Yemen's particularities and methodology for achieving ambition" Paper submitted to Yemen's Shoura council meeting.

[54] Olagbaju, O. , Awosusi, O. & Shaib, O. (2020). "COVID-19 Induced Changes on Lifestyles Education and Socio-Economic Activities in West African States: Recovery Strategies for Post Pandemic Era", International Journal of World Policy and Development Studies , Vol. 6, Issue. 4, pp: 38-43.

[55] Prasad, P. and Swain, K. (2009). "Effective communications through e-governance and e-learning", Chinese Librarianship: an International Electronic Journal, 27.

[56] Rashed, A., Santos, H., & Al-Eryani, A. (2013). "Determinants of behavioral intention to Mobile banking: Case from Yemen", MMEDIA 2013: The Fifth International Conferences on Advances in Multimedia.

[57] Redda, E. and Surujlal, J. (2017). "Measuring and Modelling Internet Banking Service Quality in South Africa", INTERNATIONAL JOURNAL OF eBUSINESS AND eGOVERNMENT STUDIES, Vol 9, No 2.

[58] Sabri, A. , Sabri, O. & Al-Shargabi, B. (2012). "A Cultural E-Government Readiness Model", Intelligent Information Management, 4, 212-216

[59] Sarantis, D. (2019). "Analysing e-Government Research: Current Areas and Dimensionsو" 18th International Conference on WWW/Internet, Cagliari.

[60] Scholl, J. (2007). "Central research questions in e-government, or which trajectory should the study domain take? Transform. Government: People Process Policy". 1 (2007), 67–88.

[61] Thabit, F, , Alhomdy, S. & Jagtap, S. (2019). "Toward a model for cloud computing banking in Yemen", International Journal of Research in Advanced Engineering and Technology, Volume 5, Issue 4; Page No. 14-18

[62] United Nations Division for Public Institutions and Digital Government (2020). UN/DESA Policy Brief #61: COVID-19: Embracing digital government during the pandemic and beyond, Available via https://www.un.org/development/desa/dpad/publication/un-desa-policy-brief-61-covid-19-embracing-digital-government-during-the-pandemic-and-beyond/

[63] Winarsih, Indriastuti M., & Fuad K. (2021). "Impact of Covid-19 on Digital Transformation and Sustainability in Small and Medium Enterprises (SMEs): A Conceptual Framework". In: Barolli L., Poniszewska-Maranda A., Enokido T. (eds) Complex, Intelligent and Software Intensive Systems. CISIS 2020. Advances in Intelligent Systems and Computing, vol 1194. Springer, Cham. https://doi.org/10.1007/978-3-030-50454-0_48

[64] Yildiz, M. (2012). "Big questions of e-government research", Inf. Polity 17 (3/4), 343-355.

[65] Yusuf, M. , Adams, C. & Dingley, K. (2016). "Review of e-Government Research as a Mature Discipline: Trends, Themes, Philosophies, Methodologies, and Methods" The Electronic Journal of e- Government Volume 14 Issue 1 2016 (pp 18-35).

[66] Zolait, A. , Ibrahim, A.& Farooq, A. (2010). "A study on the Internet security and its Implication for E-commerce in Yemen, International Journal of Technology Diffusion", 1(3), 34-47.

[67] Zolait, A. , Sulaiman, A, & Alwi, S. (2007). "Internet Banking Adoption In Yemen: An evaluation of Banks' Websites", Conference on Information Management and Internet Research Nov 6-7.

[68] Zolait, A., Sulaiman, A. & Alwi, S. (2008). "Prospective and challenges of internet banking in Yemen: an analysis of bank websites", Int. J. Business Excellence, Vol. 1, No. 3, pp.353–374.

AUTHORS

First Author – Arwa Aleryani, Associate Prof., arwa.aleryani@gmail.com

Correspondence Author – Arwa Aleryani, arwa.aleryani@gmail.com, dr.aleryaniarwa@gmail.com