

E-Government: Limitations And Challenges: A General Framework For To Consider In Both Developed And Developing Countries

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Abstract: Technology is considered as most dynamic aspect of our life, it affects our living standards, way of living and how we are interacting and proacting, thus we can say that its vital rather than important....

The technological development indeed has transformed the rigid government policies and strategies toward e-government, were as to become more dynamic, responsive, accessible, effective and provided in more efficient matter. The e-government is considered as a main instrument and medium to improve and enable access of various stakeholders including citizens to a wide variety of services, which is in role will improve and enrich the effective usability of information and communication technology (ICT) tools to provide better, improved, advanced, transparent, and reliable sources of services to the macro level of society. Accordingly, the government plans and initiatives shall be available to the public through e-government portals with improved accessibility and high level of security and privacy. Many of developed countries have integrated but up to a certain limit the e-government models whereas other still under development phase and continuous improvements. Nevertheless, along with the recognized and desired benefits and synergies that e-Government may provide to governments, stakeholders and the societies on macro level, it still faces many obstacles and challenges. Therefore, there are always several critical success factors and risks associated with e-Government that we will try to address.

Index Terms: Barriers, Benefits, Challenges, Cloud Computing, Digitalization, Developed Countries, Developing Countries, E-Government, ICT, Government Portals, Opportunities, Ranking.

1 INTRODUCTION

Continuous rapid growth in technology development had deeply affected our way of living, adaptation, and behavior, especially in the way we communicate and how services is delivered. Enhancing and sustaining efficiency and effectiveness with high levels of accuracy, privacy, transparency, accessibility, and reliability related to different fields of our daily interactions whether commercial, educational, private or any field that we can imagine is considered a major challenge or let's say an ultimate goal for technology. As for the government sector, all the technological terms and concepts that serve individuals in society from all sectors whether directly or indirectly, macro, or micro level are used, as well as the link between the various governmental and private institutions [1]. Concepts and terms such as the automation of processes, digital transformation, artificial intelligence, machine learning, nanotechnology and most relevant to our subject: e-government, are used intensively and frequently which continuously evolve and improve. Electronic Government (e-Government) were approached and defined by many researchers, as a method or medium to provide and deliver governmental online services throughout the use of information and Communication Technology (ICT) to citizens, organizations, and other stakeholders [2]. As another more comprehensive definition of e-government related to (Zhiyuan Fang, 2002), he had defined E-government as a way for governments to interact and dedicate the most up to date innovative ICT solutions (web-based Internet applications in specific) , were as to provide different stakeholders and users with more convenient accessibility to governmental services, that would result in improving the quality, transparency and reliability of the services and outcomes to provide greater

opportunities to participate in democratic institutions and processes. E-government is seen as one of the best methods available, from a range of online and evolving public services over the Internet and defines the use of the Internet to provide government information and services to citizens [3]. In a separate pursuit, the paucity of fund that has plagued developing countries most especially, gave rise to the quest for a cost-effective and the most efficient means of governance, in this search, e-government was developed [4].

Though, there is a consensus on the benefits of using Information, Communication Technology (ICT) in public service delivery, on the other hand there are quite considerations and obstacles in setting e-government in developing countries which limit its potentials and applicability [5]. The study in specific review and assess the latest literatures related to capturing the challenges and barriers of implementing e-government on macro level and on micro level in developing countries. Taking into consideration the dimensional factors affecting or affected by it in term of sustainable and continuous development and possibly mitigating barriers.

2 RESEARCH METHOD

An automated search strategy is used to identify relevant literature for this systematic search related to e-government giving special attention to e-government challenges, barriers, limitations, and obstacles in both developed and developing countries, with the aim of the comprehensive assessment of them to improve e-government implementation. This study approached the newest existing literatures which is considered as theoretical review to identify the general elements and possible characteristics of e-government models and persisting challenges and limitations to those in both developed and developing countries, in which it depends on those available conceptual literatures aiming to add value to the current studies and a starting milestone for future works. We used identification through searching the (Direct science, ACM digital library, MDPI and Google scholar) databases,

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using keywords as example (e-governments, e-governments and challenges, limitations, cloud computing, e-government models, developed and developing countries) and screen the most updated articles (published from 2019 until 2021). Also selected articles were based on exclusion and inclusion criteria in which we excluded the articles that were in different language (if not translated to English) and kept only English language ones, in addition to excluding not published and non-relevant articles As eligibility strategy, Additionally, articles that are related to the research question and as our selection criteria and retrieve the data outcomes from database including main article even out of time frame as much as possible. The after mentioned sections brings the results of the literature review. First, some definitions are discussed. After, the main aspects and characteristics of e-government and implementation challenges are presented and reviewed. Previous studies showed several research papers through which many e-government models were developed in addition to the macro and micro challenges faced. These models and challenges will be discussed throughout the sections of this paper in order to set a possible blueprint in how to mitigate.

3 RESEARCH QUESTION DESIGN

As the ICT is the most powerful in this era, including the most services in both Government sector and private sector, where governmental sector still has some challenges and limitation, so we need to figure out what barriers and challenges exist, the aim to find answers this article to our question. Research Question from this article is " What is e-government and What are the most frequent known limitations and challenges of e-Government implementation in both developed and developing countries. Were as to assess to possibly overcome in future works to assure more smooth sustainability for improved efficiency and effectiveness?"

4 BACKGROUND & RELATED WORKS

E-government & Government Digitalization has become an essential channel for delivering government services in effective, efficient, credible, reliable, and transparent way, were as it improves the government performance credibility and proactivity in addition to enabling quick responses to many wide aspects and reduce process floating periods needed to improve satisfaction and user experience. Historically, the process of sharing and exchanging of information and data among different government agencies and departments had driven services and boosted the effective use of human and technological resources. Now day, governments must come out with innovative and effective solutions to resolve and override challenges and obstacles needed to enable the effective implementation of an e-government projects [6]. This shall be performed taking into consideration the economic, political, and social changes, were as to assure model flexibility and adeptness. The expectation that the information is provided only once and is used by others in multiple instances, imposes the vital need to develop a comprehensive framework of sustainable cooperation and effective exchange of information between public and private stakeholders [7,8]. The continuous changes of government policies and procedures is considered as a characteristic that makes public sector agencies maintain independent IT systems, even under a similar platform for electronic government [9]. This behavior can be illustrated throughout the possible lack of knowledge to integrate technologies, dependance over private sector to

manage and maintain such systems, or even fiscal limitations and barriers that prevent them to invest in new infrastructure, applications, or human assets to deploy such technologies [10]. E-government is not just developing a website; it is the government's ability to provide services via the websites that have the features to facilitate access to services by citizens. E-government should enhance the interaction between governments and their citizens by facilitating their online access to government information and services [11]. Multiple studies were reviewed related to other developed or even developing countries to assess e-Government adoption (for example, studies [12,13,14,15]; each of them contributes to providing a strong theoretical understanding of the factors addressed in their research. These studies discuss multiple potential benefits of e-Government implementations. Nevertheless, to the best of those researchers' knowledge, a few case studies illustrate the merits of implementing e-Government services. Additionally, those studies are considered subjective, general frameworks, conceptual and descriptive in its nature and failed to provide from our point of view the actual relevant facts regarding the status of e-Government in developing countries in specific. Hence, this paper discusses multi-internal and external, macro, and micro factors in adoption of eGovernment services. Based on those findings, the paper provides recommendations for better future implementation of e-government and setting the related framework on the use of digital technologies needed to be adapted in public sector reform.

4.1 E-GOVERNMENT AS A MEDIUM: A GENERAL COMPREHENSIVE OVERVIEW

E-Government plays a crucial role in processing information for the management of citizens and businesses by the government [16]. An e-government initiative may include a citizen-centric portal, online income tax, land and property system, e-learning, e-social services, government to employee portal and integrated financial management systems [17]. Accordingly, e-government is expected to decrease travelling costs, reduce waiting time for the service, reduce operational time, decrease corruption and cost in service delivery, increase transactional capabilities and convenience and improve accessibility [18]. The most important aspect of e-government models implementation can be on how to transform and evolve both internal and external relationships of governments to reduce and mitigate complex and inefficient model [19]. The emergence of e-government was a response to make government departments and agencies more efficient and open in public service delivery by utilizing ICTs to provide services electronically [20]. Accordingly, the resulting transformation will make the government more effective and transparent in delivering public services. For those reasons, the concept of e-government is treasured for being evolutionary, transformational, efficient, credible, reliable, and transparent. Such transformation drive in public service is facilitated by the following e-government delivery models [21]: Government-to-Government (G2G): Government institutions provide services to each other, whether direct services are requested from one institution to another, or government institutions may speak and support basic services owned by some government institutions. This model provides the Government's agencies cooperation and communication in online base on huge databases of government, were as to improve the efficiency, transparency, accessibility and

credibility. Government-to-Customers (G2C): This is intended to provide government services to customers and those who consider members of society if they are citizens, residents, tourists, and investors. This concept seeks to clarify the idea and mechanism of providing electronic services provided by the government to the customers. Government-to-Business (G2B): It involves actively driving E-transactions initiatives such as e-procurement and the development of an electronic marketplace for government purchases; and carry out Government procurement tenders through electronic means for exchange of information and commodities. The intent of many countries in developing and improving the concept of e-government in their business environment during the last ten years had evolved with an impact on customer satisfaction through improving the infrastructure of communications technology and using the best systems that resulted in the development of service delivery operations. According to the below table, extracted form (The United Nations E-Government Development Database (UNeGovDD), we can notice the rank change of developed countries in the field of e-government in the world in year 2020 compared it with their rank in 2010:

Group	Rating Class	Rank 2010	Rank 2020	EGDI 2020	Rank Change
Denmark	VHEGDI VH	7	1	0.9758	6
Republic of Korea	VHEGDI VH	1	2	0.956	1
Estonia	VHEGDI VH	20	3	0.9473	17
Finland	VHEGDI VH	19	4	0.9452	15
Australia	VHEGDI VH	8	5	0.9432	3
Sweden	VHEGDI VH	12	6	0.9365	6
United Kingdom of Great Britain and Northern	VHEGDI VH	4	7	0.9358	3
New Zealand	VHEGDI VH	14	8	0.9339	6
United States of America	VHEGDI VH	2	9	0.9297	7
Netherlands	VHEGDI VH	5	10	0.9228	5
Singapore	VHEGDI VH	11	11	0.915	
Iceland	VHEGDI VH	22	12	0.9101	10
Norway	VHEGDI VH	6	13	0.9064	7
Japan	VHEGDI VH	17	14	0.8989	3
Austria	VHEGDI V3	24	15	0.8914	9
Switzerland	VHEGDI V3	18	16	0.8907	2
Spain	VHEGDI V3	9	17	0.8801	8
Cyprus	VHEGDI V3	42	18	0.8731	24
France	VHEGDI V3	10	19	0.8718	9
Lithuania	VHEGDI V3	28	20	0.8665	8
United Arab Emirates	VHEGDI V3	49	21	0.8555	28
Malta	VHEGDI V3	30	22	0.8547	8
Slovenia	VHEGDI V3	29	23	0.8546	6
Poland	VHEGDI V3	45	24	0.8531	21
Germany	VHEGDI V3	15	25	0.8524	10
Uruguay	VHEGDI V3	36	26	0.85	10
Ireland	VHEGDI V3	21	27	0.8433	6
Canada	VHEGDI V3	3	28	0.842	25
Kazakhstan	VHEGDI V3	46	29	0.8375	17
Israel	VHEGDI V2	26	30	0.8361	4

Fig1: UNeGovDD Developed Countries Ranking in Field of E-Government

From the above table, we can notice that 5 of the above listed countries had achieved an enormous improvement in the implementation of effective e-government, and some of them had severely dropped.

4.2 E-GOVERNMENT CHALLENGES: MICRO AND MACRO, INTERNAL VS EXTERNAL FACTORS

E-government is counted as a tool that demands rethinking the current processes and changing organizational behavior needed to set the appropriate road map to deliver public services more efficiently. A significant strategic phase toward reliable and effective e-government adaptation demands a full understanding of e-government challenges. Regardless the country ICT infrastructure advances, many technical and non-technical barriers will be encountered in the process of adoption of e-government [22]. Accordingly, the issues that affect successful implementation of such models should be addressed and resolved, so all stakeholders will benefit [23]. Macro factors play a critical role for e-government, such as the social, political, and economic state in relation to the nation's e-government maturity are vital. While micro factors determine the success or failure of e-government, such as human resources, provision of ICT infrastructure as the most influential drivers for adoption [24,25]. We could say that e-government project rollout and adoption is not an easy or simple process, its considered complex and multiple procedure demanding a mix of micro and macro factors: technological, institutional, and organizational, social, and cultural, economic, as well as legal, as per to the described above. A challenge for any public administration is the development of an e-government model that will be flexible and dynamic to changes in legislation, policy, procedures, laws, technology, and user requirements [6]. The biggest challenges is related to the internal structure of e-government (G2G), which is a key factor to develop a sustainable model. This can have a high effect on other processes, stages, or aspects of the project [26]. Several barriers and challenges persist which may restrict the full and comprehensive effective implementation of e-government infrastructure, which will provide impaired and negative outcomes. According to our literature reviews, those are the most recognized:

- Economic factors: Investing in ICT assets such as both hardware and software systems are considered vital for its sustainability. Furthermore, a nation's budget is an economic indicator which affects the full implementation of e-projects [27]

- Technical factors: many technical challenges may be faced during the implementation process and adoption of e-government. Those obstacles include the lack of shared standards and compatibility on infrastructure among departments, or concerns on information security and the privacy or accessibility [28].

- Social and cultural factors: The social divides within a country are shaped by the level of education of citizens and government employees, income, age, geographical location, gender, and family type, those shall be considered to build a comprehensive model that satisfy and consider their needs and characteristics [29]. Constraints in e-government models development arise from two pillars: the citizens or society and the government [30].

- Organizational factors: Lack of qualifications and training, resistance to change, limited stakeholder capabilities are major challenges in the project success. The human capital of a country is another parameter that is encountered and should be considered in e-government adoption and

implementation. Limited ICT skills and awareness within the public sector services and structure, and the level of education are some of the human factors which may lead e-government initiatives usually to fail [28].

- Legal and political strategies: A e-government policy backed up by laws and regulations shall be placed. Without a legal base, the adaptation and implementation of e-government is impaired. If there were no legal basis, the decision-making process of e-government should be formalized to assure transparency, credibility, and reliability [31,32]

- Environmental Factors: They refer to government policy towards pollution, utilization of eco-friendly technology, energy efficiency, climate change [33].

The UN report quotes Garner Research statistics that indicate e-Gov projects fail at the rate of 60%. This is related to many aspects mentioned above in addition to the fact that governments may not have the ability to adapt as private organizations do, the political framework change continuously and can be difficult for government program to have a completely transparent structure.

4.3 THE USE OF CLOUD COMPUTING IN E-GOVERNMENT

Cloud computing were developed to improve communication and the delivery of services in both businesses and governments globally [34]. Governments globally and due to the technological advances were driven to invest in cloud computing in e-government systems to improve accessibility, comprehensiveness, and sustainability. Despite this, the use of cloud computing in e-government has faced many challenges that resulted in a debatable issue for its establishment in a nation [3]. From multiple researchers' perspective those were the major considerations:

- Privacy Risk: Cloud computing does not have the aspects of storing and processing of information at the local organization, whereby it is conducted by a third party [35]. The involvement of a third party in storing information exposes cloud computing information to unauthorized and unwanted users being able to access citizens' confidentiality [36].
- Technology Readiness: Cloud computing is readily available to be integrated into e-government. However, governments must lease cloud services from a cloud computing provider as a third party [37].
- Reliability: The cloud relies on a high-quality successful system in government operations relying on the e-government portal and applications [38]. A system failure based on cloud services results in the stoppage of numerous services that are crucial in the running of government operations in both public and private sectors.
- Security Concerns & Trust in the Internet: Security deficiencies in cloud computing technology exposes e-government to confidentiality and integrity risks of sensitive information; inadequate security in cloud-based e-government inflicts distrust by users of e-government [39]. Government tends to take control of everything concerning the affairs of their citizens through directly protecting sensitive information. However, the provision of cloud services by a third party impedes them from control of their sensitive information [40].

This innovative technology has a considerable number of benefits that make it a vital asset to the provision of information and services to citizens and business. The benefits

generated from adopting cloud computing include flexibility, Scalability, efficiency, availability, reliability, system integration and numerous others [41].

4.4 E-GOVERNMENT IN DEVELOPING COUNTRIES

Although e-Government is a global phenomenon, simply transferring ICT solutions and related organizational concepts from developed to developing countries seems inappropriate. Arguably, e-government is an imported concept based on imported designs and it is diffusing slowly within developing countries due to inadequate e-Readiness for e-government [42]. Similarly, inadequate infrastructure, low literacy, poor economic development, and differing of cultural factors are prevalence in developing nations. Most, if not all, currently published e-Gov initiatives and strategies are based on successful experiences from developed countries, which may not be directly applicable to developing countries [43]. According to Gao and Gunawong [44], "many e-Gov projects are very complex, involving multiple tasks, such as constructing a large-scale ICT infrastructure, restructuring public activities, and providing broad ranges of public services". Due to these complexities, e-Gov projects are generally at risk of having undesirable objectives. In essence, e-Gov failure is a widely existing but poorly understood phenomenon due to implementation challenges. Corruption is among the serious contextual constraints that face e-Gov success in both developed and developing nations. Although corruption exists in all countries, but its intensity differs from country to country. Regrettably, it is most common in third world nations [42].

The E-government projects in developing counties face a variety of challenges during their implementation and utilization but the severity of these issues varies from context to context as pointed by multiple researchers [45]. Generally, these challenges can be categorized as follows:

- Infrastructure: Many studies have concluded that developing countries do not have adequate infrastructure to successfully deploy e-government projects. Challenges such as low penetration of fixed-line telecommunications; inadequate electricity supply and low tele density make it difficult to deploy e-government countrywide [46].
- Interoperability: This reflects the ability of independent systems and devices to communicate with each other and exchanging data. Most of the e-government systems deployed in developing counties operate in 'silos'; the e-government landscape is allocated separately within and across ministries, departments, and agencies [47].
- Digital divide: The digital divide is a dynamic and complex problem that is creating service gaps in developing countries particularly in the utilization of e-government services. It is the gap between people who have access to the internet and those who do not [18]. The digital divide reflects the lack of and/or limited access to electronic services by citizens.
- Human factor: The human factor is critical in the success of e-government. According to Farzianpour et al. [48], once the infrastructure has been established, there is a need for ICT skills to enhance the effective implementation and utilization of online services.
- Policy factor: According to Dias [49], "a policy is a premeditated plan of action aimed at guiding decisions

and accomplishing judicious outcomes". The issue of policy as well as forms part of the factors that affect the implementation of e-government [48]. This is because the deployment and use of e-government systems call for a variety of policies to regulate electronic activities

- Funding: Funding is the priority factor for successful e-government adoption because "any e-government initiatives require funding to initiate and maintain e-government projects" [47]. Most governments in developing countries are seeking optimum and cost-effective solutions to implement such projects, they lack enough financial support resulting in a funding shortage [50].

5 CONCLUSION AND RECOMMENDATIONS

Digital government is the innovation of the 21st century and its importance in transforming the way government does business cannot be over emphasized. e-Gov is a necessity for world governments that are soliciting for better governance and economic development as governments around the world are under pressure from rapid globalization, fiscal, social and technological changes to provide services that are citizen-centric, efficient, transparent, and effective, and one-stop, any time and nonstop. The adoption of technology is the most efficient way to integrate the public and private sector and to provide services with accountability, transparency, and efficiency, but this is not an easy task, especially for developing countries. The e-government nature and models vary from one country to another, and it relates to several challenges and limitations that faces governmental agencies in increasing this approach adoption in a wide scale. This paper involved a close assessment of the micro and macro factors that are affecting e-government, in which it is important to consider reducing their effect on e-government adoption, implementation, activities, risk mitigation and performance. According to the opinion of researchers in the field of information and communication technology E-Government implementation challenges can be technological; a country's infrastructure and economic problems can often derail e-Government services initiatives and lack of funding for implementation, and/or cultural problems. Major challenges and limitations have been identified and briefly discussed in this paper. In addition to the organizational and institutional factors, human resources are an important factor which impair the e-government transformation. The lack of adequate training, the absence of appropriate human resources, as well as the lack of expertise from both government employees and managers, will have a negative effect on the implementation of e-projects, this might be our prospective as a result of the absence of strategic direction according to our reviewed literatures. E-government systems may fail if the government will not educate and increase the awareness of citizens and both internal and external stakeholders about e-government values mainly. E-government failure is still critical ranging from partial failure to complete due to use dissatisfaction with e-government adoption. The support of top management of government positively contributes to reduce or mitigate the effect of those factors. Understanding those factors and challenges helps countries (both Developed and Developing) to reduce the gap between e-government design and what goes in reality, taking into consideration each country characteristics and determinants as each different countries may have their own peculiar and unique challenges.

Accordingly, it is important to set a clear framework and vision from the initial step and focus on determining the provision of all internal and external elements that contribute to the successful implementation of e-government projects, with the possibility of evaluating them continuously whether they are in the implementation stages or after implementation. The technological revolution is accelerating in development, and this is what leads to governments with insight and work on the strategy of information and communication technology in their work environment to digital transformation of the processes of internal procedures and their services to their customers in parallel with the general strategic plan of the institution in line with the government's strategy towards digital transformation under the umbrella of the concept of e-government and they reached the concept of Smart government.

The study provides the following recommendations:

- Developing countries shall maintain a dedicated budget to fund the implementation of infrastructure and e-government projects.
- Government agencies should compete with the private sector in the ICT job market to attract the best ICT employees to drive and maintain e-government services with continuous development and update.
- Citizens and Internal and External Stakeholders Involvement in the design of e-government models and projects.
- Priorities shall be arranged in deploying government-owned infrastructure; e-government funding; and IT human capacity development.

Given this initial effort, we acknowledge some of the limitations of our approach and methodology, in which using a limited number of keywords to identify research related to e-government challenges, models, contribution to economies besides to cloud computing use in e-government which might have left out relevant research. Most importantly, we acknowledge that the next step of our endeavor should be to provide a theoretical framing of the links between e-government challenges, the country core characteristics, and delivery channels. In conclusion, the results of this study may direct the decision-makers in the government institutions to the appropriate policies, institutional frameworks, and correct actions that can be applied to successful E-government implementation. For future research, the topic can be related to barriers of e-Government implementation in cases related to the characteristics of poor countries, developed countries, and developing countries like Palestine in specific to exploit the potential benefits of e-government services to transform the way they govern and facilitate the development of its economies and improve citizens interactions and service delivery for more satisfaction and cost cutting.

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