E-government Maturity Model: Developing Countries (Yemen)

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Abstract - E-government (Electronic government) is one of the hottest topics in the Information Technology revaluation. The huge benefits that can be gained were the reason to implement e-government in most countries. However, achieving e-government is not easy Many stages should be implemented to have E-government fully functional . The controversy continues when mentioning previous experiences in the application of e-government, stressing that E-government success or failed is one of the complex issues that are needed to be fully understood about concept of e-government and the benefits of its application. In this paper the maturation of E-government discusses to find out the reasons and solutions to overcome failure . Yemen e-government is struggling to be fully functional. Aims of this paper to investigate the reality of Yemen e-government situation and determines its maturity stage based on maturity models .Furthermore, the paper defines the stage that must be applied to move e-government in Yemen straightforward to be more active and functional .

Keywords - Yemen; E-government ; maturity models; stages, transaction.

1. Introduction

The Internet and Information Technology make a new revolution in many aspects. One of them was E-government .The term of E-government emerged in the late 1990s,it has started to change the systems of the human life .There are many definitions for e-government . E-government can be defined as "the transformation of public sector internal and external relationships through net-enabled operations, IT, and communications, in order to improve government services delivery, constituency participation, and internal government operations"[1].E-government is a dynamic connection between governments services and citizens by ICT [2] . According to these definitions e-government is un essential requirement for any country sought to serve its citizens nowadays with transparency and trust . As [3]transforming government to e-government is essential and brings many advantages ,one of the advantages is to reduce the corruption in the country [4], Reducing production cost, better Services, Administrative benefits, political benefits, provision of useful information, assisting users understanding about the services on offer, providing an efficient communication channel, answering queries about public services [5].In case the country decides to implement e-government it has to start implementing a set of initiatives . Initiative can be defined as a new plan or process to achieve something or solve a problem. E-government is considered as huge project which needs to be applied as group of initiatives ,those initiatives have to be taken by the decision maker [6].The process of choosing

those initiatives is crucial. It needs to analyze the real situation and plans that should be reached. Basically, implementing initiatives should be decided after evaluating the situation and based on the government potential .Implement e-government is a long and challenging process ,it starts simple and continues to become complex and integrated .

2. The Failure of E-Government in Developing Countries

E-government is not simple project that any country can succeed to apply it .Many studies have been conducted as attempt to find the factors behind success or failure of e-government especially after the significant percentage of failure[7]. The implementation of e-government systems is a challenging task. The obstacles and challenges facing e-government implementation starts from raising awareness, reengineering processes, and online service delivery, right up to building human capacity and IT infrastructure. E-government is costly; it has multiple requirements of: stable technical infrastructure, a stable political system, a legal framework in place, and highly skilled people [8].E-government needs trust , Privacy ,security etc. That effect definitely on e-government especially in relationship between e-government and citizens[9]. The rate of e-government failure in developing countries extremely high, it is 60–80%[7]. According to [7] the gap between the reality and the design emphasize in the importance of reducing this gap to success in e-government .The model of [7]provides sharp vision about the dimensions of e-

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government(organization ,Technology).[7] demonstrated two types of failure e-government in developing countries , First, total failures which happened when e-government was not implemented or was implemented but immediately abandoned, second, partial failures (final goals were not implemented and/or the outcomes were undesirable).

3. E-government Maturity Model

Lyane and Lee model is one of the most famous models that determine the maturity of the e-government . This model has four stages " (1) cataloguing, (2) transaction, (3) vertical integration, and (4) horizontal integration" . Each of these phases can be accessed by series of successful initiatives of government. The Cataloguing stage: - It is the index and compilation of all data and information about the ministries and government agencies as well as the types of services provided by those agencies. In this stage citizens learned, and knowledge of the fees and the laws applied to get the services, which is using the phone or go directly to the offices of the government. The Transaction stage (known as the basic stage to base the rest of the stages): - where the initiatives focus on activating all services electronically through the site of e - government and provide it to all beneficiaries, either citizens or other agencies . This is through the transferring of services that are traditionally provided (paperwork) from government agencies to electronic services .

The Horizontal integration stage : At this stage services are provided through a unified database to link services to each other to provide unified data for all services related to the customer and helped to get the services as soon as possible .The Vertical integration stage: is developing an electronic medium through which the services are addressed automatically without return to the human factor. Services become intelligently communicating and understanding with each other to reach a high level of service delivery.

In addition , [10] demonstrates the stages of e-government as five stages , the "Web presence": which features simple and limited information available on the web. (2) "interaction": that features search engines and downloadable forms.(3) "transaction": is online transactions with the possibility of electronic payments.(4) "integration": This stage features horizontal and vertical integration. Moreover, performance can be measured at this stage using statistical techniques.(5)
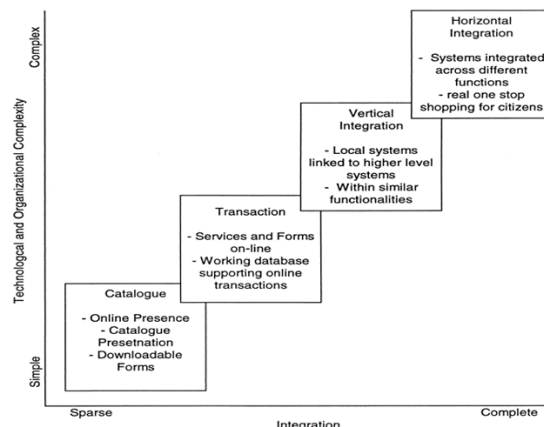

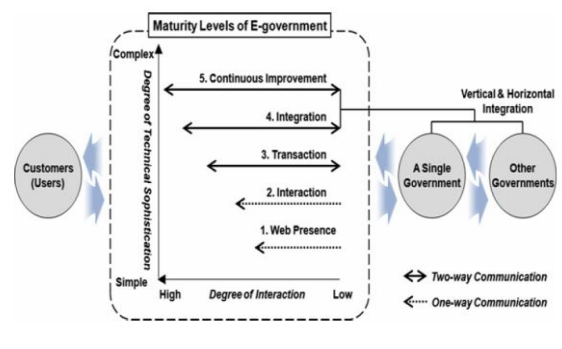Fig 1. Dimensions and stages of e- government development.[11]

Fig 2. E-government maturity model[7]

according to [12,10,11] most of the maturity models have the same first stage which is "web presence " and is limited to provide documents with basic information .

4. Yemen E-government

Yemen is a country at the southern end of the Arabian Peninsula. It is the second-largest Arab sovereign state in the peninsula, occupying 527,970 square kilometers (203,850 square miles). The coastline stretches for about 2,000 kilometers (1,200 miles)[8]. It is bordered by Saudi Arabia to the north, the Red Sea to the west, the Gulf of Aden and Guardafui Channel to the south, and the Arabian Sea and Oman to the east. Yemen is one of the developing countries with population of 29,106,540. Yemen faces many challenges and problems ,it suffers from a very weak economy and frequent political disturbances that hinder the movement of development and prosperity . It also one of the countries that suffers from increasing population growth due to the lack of services provided by the government. Yemen has tried a lot to promote the infrastructure of health services, education ,economic, however, suffering from corruption on both sides of the economic and social sector has put a heavy burden on the government. The growing

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growth and population density have become a tremendous pressure that requires serious work to find fundamental solutions to them . The e-government is considered as the best solution to most of these   problems .E-government riches with benefits ,it works as   anti-corruption tool in most parts of the government,[9,14]. Yemen decided to implement the e-government in 2003 the decision was issued by the prime ministry to start the implementation of the government electronically at an estimated cost of $ 60 million . [9] has mentioned to the initiatives that conducted to implement   Yemen e-government like "Established National Information Centre (NIC), Telecommunications and Information Technology City, Electronic Library, Technology Journal, General Telecom Council and Data Communication" . The paper aims to shed light on the current situation of implementing Yemen e-government to determine its maturity in Yemen. The methodology of this paper is searches in literatures in leading journals and from international conferences about Yemen E-government by conduct a keyword search of 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)the keywords 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",).The methodology consists of three steps which started by reviewing all the literature about Yemen e-government , second step is reviewing the literatures study of the maturity models of   e-government to reach fully functional .The third step is review the United Nation E-government   reports ,forth step defines the maturity stage of Yemen e-government .

4- Result and Discussion

The studies have been conducted on more than one field in e-government, some of them were conducted in the assessment of the situation and studied the possibility of the application of e-government because the application is not easy in terms of enormous cost and ensure long-term sustainability. Some studies have attempted to develop a conceptual framework for e-government   to provide a comprehensive picture of the concept of e-government to facilitate its implementation. Other studies have examined the state of maturity of e-government and to identify the types of initiatives that must be implemented to proceed to the advanced stages. Despite all these studies, there are still many obstacles to the implementation of e- government and this is due to the subject of several aspects of social,

environmental, and political as well as technical. Research on such topics needs to take into consideration the directions of the country in which the e-government will be implemented, as the country's strategies and its vision of the e-government are changing from one country to another. This research proposes a modest first plan presentation in which any developing country can determine which is the case of its e-government .The main indicator can measure the e-government is the   mount of its revenue, as [10]mentioned e-government can be evaluate from its outcome and that happened when e-government become fully functional .
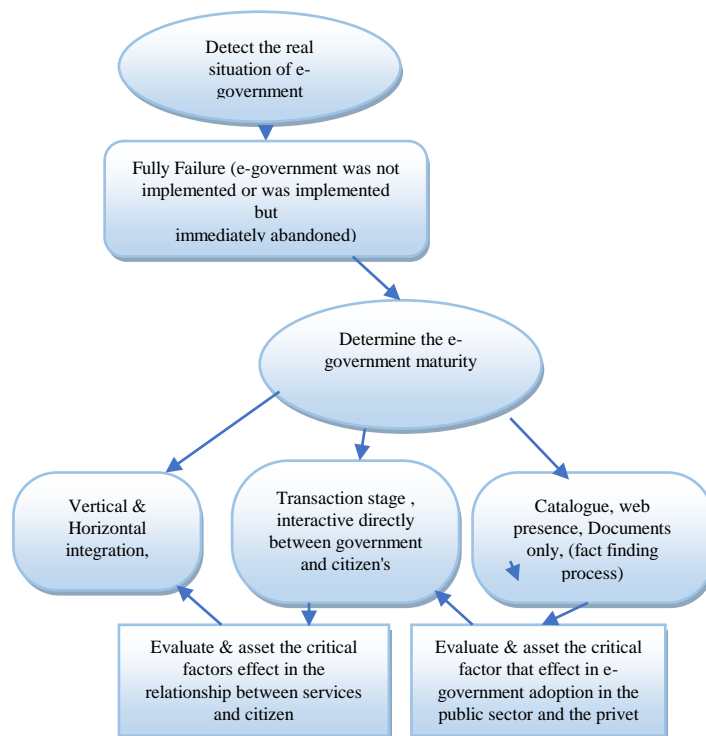

Fig3 .Detection realty of failure   e-government proposal model

Determination   the situation of e-government proposal model provides clear tracing for the   stages which are developed according to the citizens demanding and it extended from transaction stage. Mainly transaction stage is announced of e-government exist . According to [11]   the first stage is "web presence   -catalogue presentation downloaded forms" . in this stage the e-government mandatory is to provide a simple and basic information about the government and its services via web site called(e-government portal) .first stage (web presence) has many development level [12]. First , Microsoft Open Database

Connectivity (ODBC) is a low-level, high-performance interface that is designed specifically for relational data stores [13]. Second , Java database connectivity (JDBC) which provides methods to query and update data in a database and is oriented towards relational databases. ,third Adapter, fourth Screen wrappers .
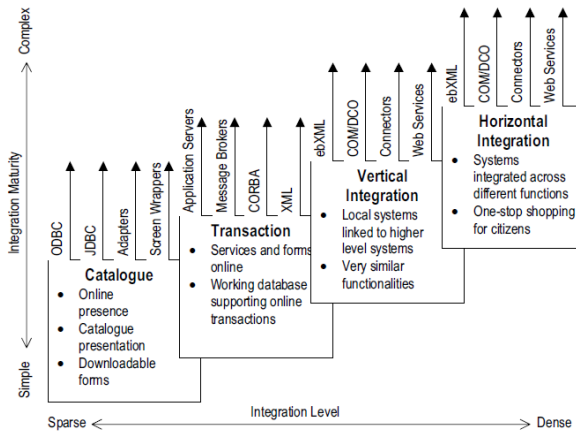

Fig 4.Mapping Technologies to e-government stages[12]

For the developing countries that are stuck in the e-government project must determine the stages reached through the implementation of the above proposal in order to reach the detailed stage that needs to adopt and implement appropriate initiatives to move forward in the implementation of the e-government , this paper applies this diagram to identify the real situation of e-government in Yemen and this may lead to a complete cessation of Yemen from countries that have stopped the implementation of e-government in light of it is one of the developing countries that considered its e-government failure ,The EGDI(E-Government Development Index) which used as a benchmark to provide a numerical ranking of e-government development of all United Nations Member States, it contains three component 1- Telecommunication Infrastructure Index (TII),2- Human Capital Index (HCI),3- Online Service Index (OSI) evaluate e-government in all countries. According to Table(1) Yemen has a low EGDI =0.2154 with rank 186 ,TII= 0.4037, OSI=0.0972 . Comparing with countries surround Yemen such as United Arab Emirates ,Saudi Arabia ,Oman. it was so clear that Yemen has a very weak Online service index which means that either Yemen E-government not providing any services so far .

Table(1) E-government Development index(EGD) [14]

Survey Year	Country Name	E-Government Rank	E-Government Index	E-Participation Index	Online Service Index	Human Capital Index	Telecom-munication Infrastructure Index
2018	Oman	63	0.6846	0.8315	0.8125	0.7013	0.5399
2018	United Arab Emirates	21	0.8295	0.9438	0.9444	0.6877	0.8564
2018	Saudi Arabia	52	0.7119	0.7135	0.7917	0.8101	0.5339
2018	**Yemen**	**186**	**0.2154**	**0.118**	**0.0972**	**0.4037**	**0.1454**

And looking to Yemen e-government website all it supports is just fact-finding process .The web site demonstrate all kind of documented services that served the citizens with not providing any electronic services .By investigating the Yemen e-government website http://www.yemen.gov.ye and In the table below elaborate the stage of technology level reached by the e-government in Yemen.

Table.2 Yemen e-government portal Mapping Technology

Technology Level	ODBC	JDBC	Adapters	Screen Wrappers
Yemen e-government portal	✔	✔	✔	✔

From the table(2) it clears that Yemen e-government portal did not have any applications server that can be provide , from all what was mentioned before it so clear that Yemen e-government stage is in the first stage which is (Catalogue or Web Presence) .
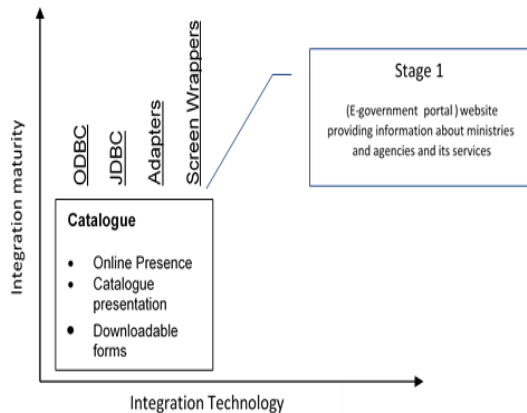

Fig 5. Yemen E-government Maturity model

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Yemen e-government maturity is in the first stage. According to [22] one of the crucial factors that must be taken into consideration to implement the e-government is to ensure that all Governmental institutions are transferred from the traditional way (paperwork) to the electronic method, in order to start providing services electronically and that what insure the important of moving to the (transaction stage) The success of e-services in Yemen depends on several factors, including the clarity of vision to implement the e-government and involve all decision-makers[21]. The previous researches did not specify the stage of Yemen e-government maturity . Hence the importance of this paper takes place to determine the stage of maturity of e-government in Yemen .In fact Yemen E-government needs to be developed by adopting initiatives that can move e-government to through by all the stages to be a fully functional e-government [11] . Accordingly, Yemen should start to adopt intuitive led to reach stage 2 which is (Transaction) and in this stage the services will prove to the citizen's through an interactive website that can provide them with their services online ,and this will be active as soon as the governments in public sector transformed to develop its services with each other's in electronical way to be able to be available on line 24hours 7days in week. This transaction become essential requirement to reach stage 2 . According to the proposed model above Yemen e-government has through the first stage successfully and it needs strongly to move to the second stage (transaction).

At this stage, all governmental institutions must switch from office work to using software and computer systems to provide services through the internal and external network. The transaction usually means a series of exchanges of information between the Government and relevant businesses electronically that are treated as a unit for the purposes of meeting the next demand from beneficiaries to ensure the integrity of the database. Both [10]and[11] agreed that transaction stage is the important stage to touch the e-government .The transaction stage is very important for its impact on e-government system implementation, it provides a two way interactive which means represents the highest level of electronic interactivity between government organizations and customers[23].This stage is has many benefits such as producing a reduction in the cost for the customer and also customer can implement complete transactions with the specified government states safely online in short time . Yemen needs to gain the benefits of implement e-government as the most of countries as soon as possible to catch the global wave that cover the world . E-government becomes essential empirical tool to connect with others around the world .Yemen e-government still in the first stage and needs to move fast to be improved with

fully functions stages . Comparing with many developing countries Yemen is back dated in implementing e-government and it has to take serious actions to start adopting a strong initiative to apply e-government to be fully functional .

Conclusions

Evaluating e-government is a very important subject, The intention of this paper proposes method for the developing countries to evaluate their e-governments , paper applies this model on Yemen e-government to determine its maturity . As a result, Yemen E government still in the stage one (catalogue) , Thus, e-government in Yemen needs to move to the next stage which is transaction .Yemen needs hard and fruitful work to reach a fruitful success that all its citizens can be touched.

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