A Detailed Study of E-government Readiness in Jordan

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Abstract

This research analyzes the development of e-government in Jordan readiness; depending on the United Nations indicators during the time period from 2003 to 2012.This study can help in the development of proposals, plans and strategies to improve the level of e-government in Jordan. This, in turn, is expected to enhance the quality of the respective citizen services while reducing its cost and increasing the efficiency.
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Keywords: *E-government, Jordan, ICT, EGDI.*

1. Introduction

With E-government development, many organizations with different methodologies and indictors have started to assess the e-government in the developed and developing countries, like: Brown University and The United Nations Department of Economic and Social Affair (UNDESA) [1] which this paper depends on its reports.

The E-Government Development (Readiness) Index (EGDI) is a composite measure of the capacity and willingness of countries to use e-government for ICT-led development [2]. The EGDI looks at the most important dimensions of e-government: (i) telecommunication connectivity, (ii) scope and quality of online services, and (iii) human capacity. The purpose of UN surveys is to achieve better understanding for the status of e-government across the world to governments, the private sectors, and the researchers.

As one of the developing countries, the Jordanian government has made an initial effort to define e-government as "the ability to submit governmental transactions on-line and make payments electronically where they are required" [3]. Ciborra [4] stated that "Jordan is a textbook case for its vision to become the Singapore or Bangalore of the Middle East in the adoption of new information and communication technologies".

This paper is organized as follows: in section 2, shows literature review with different aspects of the E-government program. Those aspects included definitions of the E-government, United Nations E-government surveys using its three indicators, and history of E-government in Jordan. Section 3 analyses the research methodology according to UN indicators. Finally the conclusion is drawn in section 4.

2. Literature Review

This section consists of three parts as follows: First, the researchers are showing several definitions of e-government then providing UN e-government surveys using the E-government Development Index (EGDI) which depends on telecommunication infrastructure, online services, and human capital. Finally, the researchers are discussing the history of e-government in Jordan.

2.1 Definition of E-government

Understanding the concept of e-government is the first important step toward accessing the success of e-government initiatives, but is not the only necessary one. The center for technology in government at the University of Albany refused the assumption of e-government that it is solely about delivering government services over internet and gave a working definition "E-government is the use of information technology to support government operations, engage citizens, and provide government services" [5]. E-government can be described as the use of any type of information and communication technology to improve services and operations provided to different parties such

as: citizens, businesses, and other government agencies [6-9].

There are multiple definitions of E-government among researchers and specialists, but most of them agreed to define Electronic government as government use of information communication technologies to offer for citizens and businesses the opportunity to interact and conduct business with government by using different electronic media such as telephone touchpad, fax, smart cards, self-service kiosks, e-mail / Internet, and EDI. It is about how government organizes itself: its administration, rules, regulations and frameworks set out to carry out service delivery and to co-ordinate, communicate and integrate processes within itself [10]. Actually the E-government added new concepts such as: transparency, citizen participation [11].

2.2 UN E-government Surveys and E-government Development Index

E-Readiness is briefly defined as the degree to which a country is prepared to participate in the networked world (McConnell report, 2000 [12]).The United Nations Department of Economic and Social Affair (UNDESA) conducted its first e-government survey in 2003 to assess the e-government situation in its member states by calculating the E-government development Index value. It is a composite index includes a telecommunication infrastructure index, online services index, and a human capital index as in Eq. (1). Six e-government surveys have conducted from 2003 until now.

The United Nations E-government development index (EGDI) = (0.34 × online services index) + (0.33 × telecommunication infrastructure index) + (0.33 × human capital index). (1)

The UN Global E-Government Survey 2003 [13] assessed 191 member states according to a composite index of e-government readiness based on website assessment (Emerging Presence, Enhanced Presence, Interactive Presence, Transactional Presence, and Networked Presence), telecommunication infrastructure(PCs/1,000 persons; Internet users/1,000 persons; Telephone Lines/1,000 persons; On-line population/1,000 persons; Mobile phones/1,000 persons; and TVs/1,000 persons.) and human resource endowment (two thirds weight for adult literacy rate with one third for the combined primary, secondary and tertiary gross enrolment ratio) and highlighted that there was a wide disparity between member states in their e-government readiness. The UN Global E-government Survey 2003 expanded and built upon the UN Report "Bench-Marking E-government: A Global Perspective" published in 2002.

The UN survey 2004 report [14] went deeper into the issues and challenges of the disparities in "access to the opportunity for development" offered by ICTs. The survey assessed the same number of member states according to the same index.

The Surveys 2003 and 2004 presented a systematic comparison of the e-government programs and initiatives of member states across the globe. Since the e-government rankings are based on relative indices, changes from year to year measure the progress of a country relative to all other countries of the world. As such the e-government index is a true global ranking tool.

In 2005, the UN survey [15] assessed the same number of countries as in 2003, and 2004 with more than 50,000 features of the e-government websites to ascertain how ready the governments around the world are in employing the opportunities offered by ICT to improve the access to, and the use of ICTs in providing basic social services. Information technologies facilitate the dissemination of information and the opportunity of feedback, as they promote access to government and are the perfect conduit for citizen-government partnership to promote public value, and therefore, inclusion.

The UN E-government survey 2008 [16], presented the importance of knowledge management to governments in their efforts to deal with the growing challenges created by the knowledge economy. In this survey the telecommunication infrastructure index became based on five parameters (Internet Users /100 persons, Personal computers /100 persons, Main Telephones Lines /100 persons, Mobiles/100 persons, and broad banding /100 persons).

The United Nations E-Government Survey 2010 [17] found that citizens are benefiting from more advanced e-service delivery, better access to information, more efficient government management and improved interactions with governments, primarily as a result of increasing use by the public sector of information and communications technology. In this report some enhancements are made, like: the web measure index became based upon four stage model (Emerging Presence, Enhanced Presence, Transactional Presence, and Connected services) and the number of questions increased to 95 in the questionnaire.

The 2012 Survey assessment [18] pointed to horizontal and vertical e-government linkages among various institutions and nodal points that have created opportunities for greater participation and social inclusiveness. By bringing technology to the people

instead of making the people come to technology hubs, and by creating opportunities for online service delivery, e-government has contributed to coordinated efforts for increased e-government among public sector officials, public institutions and citizens. The survey found that member states have begun to move from a decentralized single-purpose organization model of e-government to an integrated unified whole-of-government model for the people where this approach supported the strengthening of institutional linkages with interconnected departments and divisions; greater efficiency and effectiveness of governance systems; and better public service delivery. However, the efforts of countries at all levels of development are still affected by a lack of integration of administrative simplification with e-government development plans, lack of infrastructure and human resource capacity and a gap between e-services supply and demand. Low-income countries, in particular, continue to contend with traditional barriers to ICT investment such as lack of technical skills, high costs of technology, and ineffective government regulation.

2.3 E-government in Jordan

Jordan is a small country in the Middle East of about 6,500,249 at the year 2013 with restricted natural resources. It is one of such developing countries that have embarked on an e-government initiative.

The national E-government initiative was launched by his majesty King Abdullah II in 2001; which is part of a larger national IT strategy to grow internet use. The program seeks to be an essential and active participant in the economic and social development through the use of information and communication technology to enable easy access to government information and services for all users regardless of their geographic location or economic status or professional capacity.

To achieve this vision, the Ministry of Communications and Information Technology (MOICT) presented a strategy for development and implementation of electronic government "E-government" in Jordan for the period in mid of 2006[19], as the gap between the government agenda and the actual results from implementing the E-government project, forced the government officials to postpone some of the implementation stages for further assessment. The strategy reaffirms E-government to the goal of delivering high-quality customer centric and performance-driven services to E-government customers. The new aims summarized below as:

1) Send high-quality services to clients, businesses and organizations; which will need their awareness and improving the communication skills to involve in those services, and make them succeed.
2) Develop government performance and efficiency; for no doubt, implementing such a project will save time, hassle, money, and will make transactions easier and clearer, these factors supports the government efficiency, and effectiveness.
3) Enhance Jordan's competitiveness; and ensure public sector transparency and accountability.
4) Reduce cost and increase ease of interacting with government.
5) Promote development of Jordan's ICT sector, which is essential and most important issue in achieving good e-services.
6) Build up skills in the public sector.
7) Improve e-commerce activities, and develop information security. This is a very far stage, which will need many stages to be built before stepping to the e-commerce activities. But in general the security issue must be always in consideration in all the development stages. It is the main factor that builds up the trust.

E-government has become the effective tool to modernize Jordanian public administration, which is organized in a bureaucratic hierarchy [20]. A study [21] reviewed the status of e-government in Jordan in SWOT model as shown in Table 1.

3. Research Methodology

In this study, the researchers used government publications, newspapers, and research papers to collect data and hence analyze the current status of Jordanian e-government.

3.1 Data Analysis and Discussion

The researchers are showing an analysis of e-government surveys during the time (2003 -2012) for Jordan in Table 2.

As you notice in Table 2, the Jordanian E-government achieved the best improvement in 2008 with 0.1693 degree in the telecommunication infrastructure index, 0.6054 in the online services index and 0.8677 in the human capital index as you see in Table 3, the reasons of this improvement are the understanding of the importance of e-government websites and service from the society [10].

Table 1: SWOT Model

Strengths	***Weaknesses***
- His majesty king Abdullah the second's encouragement and support to such development, and to all of the IT and ICT developments as well. - IT industry is growing rapidly - Good percentage of population is considered IT capable, and highly-educated. - Institutions have been established to achieve and guide the government's research and development. Even the private sector is now involved. - The belief and the strong ambition in developing such a project. - IT high skilled and well trained resources are available, besides engineers. - Complete action plan to improve and grow up the Information and communication technology side.	- Poor research and development (R&D) and insufficient innovative skilled human resources to create IP products - Underdeveloped economic environment and small business sector that make it slower to create large expertise for the Information Technology sector. - Cities far away from the capital city are still not completely connected to broadband connections. And some of them even have no internet. - Many citizens find it expensive to connect to internet, or even to buy a PC.
Opportunities	***Threats***
- IT investments in e-learning and E-government to enlarge the e-services online. - Encouragement of the banking sector to start building up and improving its online services, to lead to financial transactions as an advanced stage, which will integrate with the E-government sector as a result. - Growing IT demand and E-services. - Improve and Prioritize e-learning and e-content in IT sector.	- Competitive regional and local clustering. - Local and regional political unsteadiness. -Not allowing foreign IT investors from long term investments in the country. - Insufficient funds to invest more in the ICT sector and to improve the E-services. - Tax advantages - It might take a long time to build the trust in the citizens. This will affect the performance of the e-services.

At that time DOS 2008 [22] conducted a survey to observe the awareness of the citizens. The survey covered 3340 families distributed to all governorates of the kingdom, was the proportion of response in the survey about 94% or 3145 families with the following results:

- ✓ Most Internet users are individuals in the age group 14 - 15 years, students, and those with bachelor degree or higher.
- ✓ The data indicated that the extent of Knowledge of individuals 15 years of age to get more information provided, including special E-government services was 29%.

Table 2: E-government Development Index and World Ranking for Jordan

Year	***Index***	***Rank***	***Rank Change***
2003	0.429	63	-
2004	0.4347	68	-5
2005	0.4639	68	0
2008	0.5480	50	+18
2010	0.5278	51	-1
2012	0.4884	98	-47

This confirms the existence of sufficient awareness among the citizens of the importance of the use of information and communications technology in their lives and how they wish using the e-government services.

The UN Report (2010) global e-government development ranked Jordan of 51 with an index of 0.5278 out of 1.0000 around the world, with slight retardation from 2008 survey to that survey conducted in 2010. But, Jordan was ranked 98 on E-government development index in 2012, dropped down 47 according to the same index in 2010. It came in rank 14th out of 17 countries in West Asia included in the survey. On the Arab level, Jordan ranked with position 8 behind the United Arab Emirates 28 and Bahrain 36 and Saudi Arabia 41, Qatar 48, Kuwait 63, Oman 64, Lebanon 87 after it was ranked position 4 in 2010.

As shown in Figure 1. Jordan achieved 0.2712 in the telecommunication infrastructure index which is less than the global average of 0.326 degree. This indicator measures the spread of personal computers and fixed telephone lines, use of the Internet, mobile, and fixed broadband. In the online services index, Jordan came also to a less extent than the global average, where it recorded 0.3922 compared with the global average of 0.493 degree. This index depends on a model includes the stages of providing e-government services, which begins in viewing the government information, followed by presentation of information more abundance than in the primary stage, then making the process of receiving the citizen to information from the government electronically in an interactive way, and the final stage is the integration of services. In 2006, the government formally inaugurated the e-government program with the intention of streamlining

bureaucracy and enhancing access to internet in rural areas. Currently, E-government services are provided by several public agencies including the Ministry of Justice, Ministry of Interior, Greater Amman Municipality and the Borders and Residency Permits Department [23].

It is obvious that the drop in ranking is basically return to the slowness in introducing e-services to the public. The lack of financial allocations for e-government services is negatively affecting the progress in this regard. The lack of necessary funds is also affecting the upgrade of infrastructure required for introducing additional e-government services.

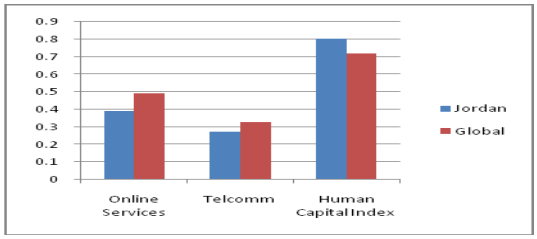

Fig. 1 Online Services, Telecommunications Infrastructure and Human Capital Indices for Jordan with Global indicators in Year 2012

The third index, which measures the human capital, Jordan has recorded 0.8013 degree outperforming the global average of 0.721 degree. This indicator reflects the literacy rate and enrollment in primary and secondary education.

Heeks [24] points out that the main problem behind e-government project failure in developing countries, returns to the gap between the design and reality in terms of information, technology, processes objectives and values, staffing and skills, management systems, and other resources such as time and money. Some recent studies have associated e-government success to the business and IT alignment across different organization types [25-27].

Jordan is one of the developing countries where the efforts are too fragmented, and more individual than collective. The government has continuously failed to bring everybody together and really enforce a policy which would force institutions to implement the program. The problem is that no one took the program to a point where there is a certain policy that comes at a top level and says this is what we agree on as a policy.

The slump in Jordan's e-government program could be partly return to governmental ministries and departments in unwillingness to transition, especially when there is nothing that obliges them to endorse the mandate. The solution lies in two parallel ways. The first way is the legislation, where the ministries have to be held accountable in front of the parliament as to whether the ministers implemented the policy, why their services aren't online yet, whether people still suffer with governmental paperwork, and why their procedures aren't transparent yet. In this way, the government departments and ministries will feel the pressure, and will resort to the expertise of the e-government program unit to get help, knowledge transfer and integration to be connected with the others, and to avoid being penalized.

The second way is the encouragement by adopting the style of rewards. Like USA, which was ranked 5th in the UN report in 2012 [18] chose the style of rewards as an incentive to implement the program and this is what the MOICT with the King Abdullah II Award for Excellence are trying to do. They fired in July 2013 award called "shift to e-government" which aims for turning to electronic transactions and services thus promoting speed up the application of modern technologies to facilitate transactions.

Table 3: Telecommunication Infrastructure, Online Services, and Human Capital Indices of Jordan

Year	*Telecommunication Infrastructure index*	*Online Services index*	*Human Capital Index*
2003	0.089	0.419	0.78
2004	0.097	0.347	0.860
2005	0.0971	0.4346	0.8600
2008	0.1693	0.6054	0.8677
2010	0.1806	0.5333	0.8694
2012	0.2717	0.3922	0.8013

No one can doubt that developing new technologies, whether in the public or private sectors, is a labor-intensive activity that requires a high skilled staff. E-government is a large field; it requires legislation, business processes, and technology. In fact, there are many challenges facing Jordan which can be summarized in political, social, technological, organizational, and financial challenges [20, 28].

For this study, the researchers have adopted trend analysis method to find the trends (positive or negative) in the UN e-government indicators in Jordan. Trend analysis is a special case of regression analysis where the dependent variable is the data to be forecasted and the independent variable is the time. To calculate the trends three to six year data were needed for telecommunication infrastructure index and two year data for the online services index where the data for the other years aren't available. The human capital index is not included in the study because Jordan recorded 0.8013 which is higher than the global average as mentioned before.

As shown in Table 4. Jordan telecommunication infrastructure index has continuously improved during the period (2003-2012). In 2003, the overall telecommunication infrastructure was low as 0.089 but the value increased to 0.2717 in 2012. The trend analysis showed as that Jordan telecommunication infrastructure index is improving every year with positive trend value of 0.035. The number of internet users per 100 persons in Jordan has been improved over the period (2003 – 2012). The estimated number of internet user were just 4.516 per 100 persons but this number increased to 38.00 in 2012 with the positive trend of 6.544 which shows that Jordanian government realized the importance of internet is an essential communication and management tool in e-government and its use has strong impact on the performance of e-government. Mobile devices could be the most effective technology of simulating the demand and supply of public service [29]. In Jordan the number of mobile subscribers was 16.71 per 100 persons in 2003, this number reached 106.99 in 2012 with positive trend value of 19.79 and this due to the cheaper mobile charges which is a normal result from the competition between major mobile service providers. Ferro et al. [30] described the importance of broadband in e-government in three different areas: political (e-democracy and political forums in cyberspace) economic (efficiency, productivity and economic growth), and social (health care, education opportunities and responsiveness by government to citizen needs). In Jordan the total numbers of fixed broadband subscribers were 0.83 per 100 persons in 2008 and it increased to 3.18 per 100 persons in 2012 with the positive trend value of 1.18. A study of DOS [31] showed that internet service via mobile broadband is the most widely used way to connect to the Internet, amounting to 56% and came in second place WIMAX at a rate of about 26%. With regard to the main fixed phone lines, the number of main fixed phone lines decreased in the period 2003-2012 with negative trend of -1.077. The survey founded that this number decreased due to the spread of use mobile devices significantly and this survey explained that the number of personal computers sometimes increased other times decreased for varied reasons i.e. no need to use and financial reasons.

As mentioned before Jordan achieved 0.3922 degree in online services index which is less than the global average of 0.493 degree in UN survey 2012. In Table 5 you can see that there is a good progress in stage 1 “Emerging information services” where Jordanian government websites provide information on public policy, governance, laws, regulations, relevant documentation and types of government services provided. They have links to ministries, departments and other branches of government. Citizens are easily able to obtain information on what is new in the national government and ministries and can follow links to archived information. There is slow progress in “Enhanced information services” because until now government websites deliver enhanced one-way e-communication between government and citizen, such as downloadable some forms for government services and applications. No audio and video. In “Transaction services” there is degradation in this stage with negative trend of -0.26. No engagement between government websites in two-way communication with the citizens, including requesting and receiving inputs on government policies, programs, regulations, etc. And still no handling for financial transactions, i.e. where money is transferred on a secure network to government. A Study showed [32] that the Jordanian government has 95% of its national ministries online, with full provision of information about services, but limited interaction with the government except via emails. The last stage is “Connected services” which means that government websites have changed the way governments communicate with their citizens. They are proactive in requesting information and opinions from the citizens using Web 2.0 and other interactive tools. E-services and e-solutions cut across the departments and ministries in a seamless manner. Information, data and knowledge is transferred from government agencies through integrated applications. Governments have moved from a government-centric to a citizen-centric approach, where e-services are targeted to citizens through life cycle events and segmented groups to provide tailor-made services. Governments should create an environment that empowers citizens to be more involved with government activities to have a voice in decision-making where this issue is still in its infancy stage in Jordan.

Table 4: Telecommunication Infrastructure Indicators (Per 100 Persons) - Trend Analysis

Year	*Index*	*Estimated Internet Users*	*Main Fixed Phone lines*	*Mobile Subscribers*	*Personal Computers*	*Fixed Broadband*
2003	0.089	4.516	12.76	16.71	3.28	-
2004	0.097	5.77	12.66	22.89	3.75	-
2005	0.0971	8.100	11.36	24.19	4.500	-
2008	0.1693	13.65	10.52	74.40	6.22	0.83
2010	0.1806	24.46	8.46	86.60	7.20	2.09
2012	0.2717	38.00	7.84	106.99	4.06	3.18
Trend	0.035	6.544	-1.077	19.79	0.379	1.18

Table 5: Online Services Indicators- Trend Analysis

Year	*Emerging information services (stage 1)*	*Enhanced information services (stage 2)*	*Transaction al services (stage 3)*	*Connected services (stage 4)*
2010	0.5	0.44	0.57	0.17
2012	0.83	0.48	0.31	0.20
Trend	0.33	0.04	-0.26	0.03

3.2 Recommendations

Based on the above analysis, the policy makers can see which indicators are more important or significant and which indicators urgently need attention in order to improve the E-government Development Index (EGDI) and individual indicator group indices.

Since 2003, Jordan telecommunications infrastructure index has been gradually increasing but it still less than the global average. Jordan should put more efforts to strengthen the ICT infrastructure and hence a better implementation of e-government

Regarding the online services indicators group, more efforts are needed especially on stage 3 "Transactional Services". Here are some recommendations can help to improve ranking of Jordan especially in the online services index.

1) There must be a single reference, its responsibility the management of government websites in the ministries and institutions to standardize the format and content of websites within a single vision of the government, taking into account the specificity of each ministry and institution.

2) There is a need for comprehensive automation for all services, and the e-government services must be expanded to keep up with developments and new technology to gain the trust of the citizens in this government websites so the citizens navigate these websites permanently and thus become the main source for their reliable information with taking into account multilingualism.

3) The development of government websites need to rely on interactivity with the citizen and navigating in a flexible manner, and trying to take the websites out of the traditional role i.e. display the information in a rigid and uncomfortable way, where the citizens can follow their transactions personally after filing electronically.

4) Giving attention to electronic content and its management, information security, where the citizens still do not fully trust with systems.

5) The budget is very limited. But even with the limited resources there's a lot that can be done, like the private sector can build the service and they can cover it from profit sharing with the government.

4. Conclusion

The main objective of this research was to provide an overview of the current status of e-government in Jordan, a program that is aimed to support the Jordanian government approach for economic growth concentrating heavily on structuring the information technology (IT) industry and integrating IT into people's daily lives. The detailed analysis for Jordanian e-government based on United Nation e-government survey reports and drives some recommendations to improve the E-government Development Index with its indicators.

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