

E-GOVERNMENT ADOPTION: A DIGITAL DIVIDE PERCEPTIONAL VIEW

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Abstract

The digital divide is a major challenge that prevents citizens from using e-government services based on three views: infrastructure accessibility, knowledge and skill level, and perception level. This study tried to explore the literature in regards to the three levels and built an instrument to measure citizens' perceptions regarding six types of digital divide: geographic, age, gender, income, education, and special needs. A sample of students was used to test the instrument and conclude to different perceptions regarding this phenomenon. Data results and conclusions are depicted at the end of this paper.

Keywords – Electronic government, digital divide, Jordan, technology adoption, citizens' perceptions.

1. INTRODUCTION

The continuous improvements in information and communication technologies (ICTs) increase the number of people in both private and public sectors, who benefit from a wide range of services provided by governments through the use of Internet and web-based applications; such phenomenon is called electronic government or e-government. It is important to understand the role of e-government in society development, where governments try to provide their services in a convenient and accessible way. Also, governments try to reach citizens and civil society institutions through their democratic initiatives. Reaching citizens is a tough job in a world of differences and diverse challenges.

E-government is defined in different ways based on different perspectives they represent [1] [2]. But most researchers and specialists agreed that it is the utilization of ICTs to promote governance and improve services. In order to develop a successful e-government initiatives, governments will face several challenges like the provision of required infrastructure, legal and political barriers, people's computer literacy and ICT use, the level of trust people have in government and its new way of performing activities, security problems, and the digital divide problem [1] [3].

This paper will try to explore people's perceptions towards the problem of digital divide utilizing an empirical test. The rest of the paper will be divided into four sections: the first section will review the literature related to e-government and digital divide. The second will describe the ICT Jordanian environment. The third section will describe the data and analysis conducted, where discussion of issues will be elaborated. Finally, conclusion and future work will be provided at the end.

2. LITERATURE REVIEW

Among the three major roles in governance (Executive, Judicial and legislative), governments play a major roles in societies as the administration of government functions and the facilitation of the two other roles [4]. Based on the role of governments in providing services to citizens in an efficient way, the digital divide can be a crucial challenge that prevents government from reaching each citizen and institution. Also, the digital divide will prevent people from participating and interacting with governments or exclude certain categories of the public from participating effectively in public activities [5].

2.1 *E-government and society development*

The role of governments in sustaining societal development can range from its services provided to citizens to facilitating democratic initiatives. Abu-Shanab and Al-Azzam defined e-government as "the use of information and communication technology (ICT) and particularly the Internet to deliver information and services by the government to its customers" [6, p. 39]. E-government is the use of innovative information and communication technologies, particularly Web-based internet applications to provide citizens and businesses with a convenient access to public information and services, to improve the quality of the services and strengthen government's drive toward effective governance and increased transparency to better manage a country's social and economic resources for development [7]. Almarabeh and AbuAli defined e-government as "government use of information and 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 touch pad, fax, smart cards, self-service kiosks, e-mail/Internet, and EDI" [1, p. 30].

The literature shows that e-government can be classified into several categories based on whom it provides services and benefits, which range from citizens, public agencies, social and political organizations to citizens, business, employees and non-profit organizations. Government-to-Citizen (G2C), Citizen-to-Government (C2G), Government-to-Business (G2B), Business -to-Government (B2G), Government-to-Employee (G2E), Government to-Government (G2G), and Government-to-Nonprofit (G2N) are examples of e-government categories [8].

Information technology acts as an agent for changing how the society performs its political, economic and social activities. West emphasized the role of ICT in society development since the advent of telegraph and telephone to the explosion of the Internet and Web 2.0 tools [9]. He emphasized the full two-way communication between governments and citizens and the interactivity aspects of such communication. On the other hand, earlier societies resisted technology on the bases of its harmful influence like invasion of privacy, tracking, and unemployment [10].

Guanghua showed that several governments try to use information and communication technology (ICT) as a way to improve their interactions with citizens through providing them with real time access to information and many e-services via the Internet, which results in more effective, efficient, transparent and accountable governments [11]. Such adoption of ICTs has a significant impact on developing the society and will act as an enabler for changing society and building what we can call electronic society (e-society), which results in new ways for governments in performing their activities and new relationships with citizens. Also, it is important to furnish needed infrastructure for the intra-society interactions (among citizens and different civil society institutions). Groper stressed the concept of social capital, which he defines as the degree of interaction between citizens [12]. Such capital can be augmented through the trust, flow of information, and the degree of problem solving within society. Finally, Groper concluded to the fact that digital divide is a barrier between societies and the wealth of such social capital.

Ndou introduced three critical transformation areas through which e-government plays a critical role in transforming and developing society; internally, where the adoption of ICT improves the efficiency and effectiveness of internal transactions conducted through the network of government and public agencies with minimum effort, time and cost needed [2]. Secondly, externally, in which several opportunities are opened up for citizens to interact with governments and conduct activities electronically in more transparent ways. The last transformational area is relational area through which governments try to rebuild their relations with citizens in a way that make citizens trust in governments and their new ways of performing e-transactions, which results in fundamental changes in the way people live and societies function.

E-government will facilitate society development and transformation by focusing deeply on the following four elements: creating an environment that enhances all government's interactions with citizens, developing skilled human resources through effective development program provided by e-government, building an information infrastructure that enables citizens to benefit from meaningful information available at e-government sites and helps them perform a wide range of activities, and concentrating on improving the ICT industry [13]. The focus on these elements will transform the way

society functions and the way citizens view e-government initiatives which contribute to society development.

The change in society will be auctioned through few steps that start with making available needed ICT tools, through which ideas and thoughts are disseminated [14]. The author proclaims that the purpose is providing information, which is a pre-requisite for engaging in a discourse that results in a social change.

2.2 *The digital divide*

As discussed earlier, it is important to make public services available to all sectors in a country, where sectors here have diverse implications. Based on such argument, many types of digital divide emerged in the literature like: people with disabilities digital divide [15], gender digital divide [16, 17, 18 & 19], race digital divide [20], age digital divide [20, 21 & 22], education digital divide [23], and income digital divide [15].

Relating e-government to digital divide is common in the literature [24]. Digital divide is a dynamic and complex problem that was introduced in the mid-1990s especially for countries that have e-government initiatives based on the wide use of ICTs or utilizing the Internet as a dynamic channel of communication, providing citizens with the needed services and knowledge [25]. It can be defined as the gap between people who have an effective access to the Internet and ICT and others who don't have [26]. On the other hand, digital divide goes beyond the physical access to the Internet or technology; it is the real access, reach and the socially responsible connectivity [27].

Helbig, Gil-García and Ferro introduced three levels through which digital divide can be explored and using three approaches; in the first level, digital divide can be explored using a technology access approach, which differentiates between people who have access to technology and others who don't have [28]. The second level, the multi-dimensional approach, in which several factors are considered when exploring the digital divide like: the existence of different economic opportunities, the differences between developed and developing countries and people's technical skills. Seckin related digital divide to countries, geographic areas, gender, age, and other demographic factors [15]. The last level explores digital divide using multiple-perspectives approach, in which people can be studied based on their values, beliefs, mental models and skills, also the impact of race, gender and ethnicity is considered. The literature shows that digital divide can be noticed internally (local digital divide) and externally (global digital divide).

Similar to this categorization, Orbicom classified digital divide into two types: access divide and skill divide. Access divide relates to physical barrier to technology, and the skill divide is the competencies needed to utilize the technology and the Internet [29]. Also, Baker and Panagopoulos (2004) viewed the issue from users' perspective, where it relates to the physical reach to technology, the availability of suitable content, and the perceived utility of technology and its content [30].

Savic and Radojicic indicated that digital divide is a complex and difficult problem to conceptualize especially that each technology will have a digital divide issue based on how it will be investigated and the factors that are considered; the differences in people's needs, their skills and educational level [31]. Such complexity can widen or limit the scope and impact of bridging digital divide challenges, which differs from one individual to another and from one country to another. On the other hand, thinking of digital divide only in terms of "have" or "have not" and ignoring the technological, social and human factors is becoming a challenge and rethinking of digital divide using multi-dimensional framework is needed [32].

The digital divide can result from a deficiency in the ICT infrastructure in the country and the political will and leadership support [33]; the economic and income levels [34]; and education and literacy levels [24 & 34]. Finally, some research added technology type and cost as reasons that shape the digital divide [35]. Based on that, researchers proposed different methods to measure the digital divide similar to the ratio of ICT services to population or ICT penetration to the GNP [35]. Also, other methods for measuring the digital divide utilized mathematical equations or quantitative models [36]. To bridge such phenomenon several methods can be used, the following are useful tips: formulating a well-balanced development strategy with continuous monitoring of information society, increasing the human resource power through strategic investment in education and ICT infrastructure, and the need for great focus on people's special needs and their perceptions [31].

2.3 *Digital divide perceptions*

Governments perceive digital divide in a way that differs from how citizens perceive it. From governments' side, the literature shows that digital divide can be perceived in one of four ways, which can be derived from the classical definitions of digital divide. The first way focuses on the gap between people who have an access to use ICT and those who don't have [26]. The second way focuses on people's ability to use ICT or the skill divide [29]. The third one is based on the actual use of ICT that can be measured through monitoring how people consumed their online time and the extent to which they benefit from e-government services. Such view is in agreement with the view of Hill et al. [27], which stresses the importance of aligning the ICT services with the social responsibility and requires a suitable use of technology that fits with the environment. The last way focused deeply on the impact of using ICT in changing the way governments work and the way people perform their activities.

Such implication is supported partially by previous work proposed by Baker and Panagopoulos [30], where the authors emphasized the importance of citizens perception of digital divide. Their view is related to more than interacting factor like the utility of technology and how it can serve citizens in certain situations and geographic area. Also, what governments perceive as shortcoming, might not be noticed by citizens and vice versa. From citizen side, the literature indicates that everyone has a different perception regarding digital divide based on their needs, age, educational level and many other factors that differ from one individual to another and from a country to another.

3. DIGITAL DIVIDE REALITY IN JORDAN

According to Ottoum and Suleiman [37] the first ICT initiative started in Jordan in 1999 and resulted in launching the REACH initiatives (1999-2005); such initiative outlines not only the current situation in Jordan but also the goals that the Kingdom needs to achieve in relation to the Jordanian ICT sector. The REACH initiative was followed by the national ICT sector strategy (2007-2011) and another initiative that will be launched soon (2012-2016).

Nowadays, the ICT sector is a growing area that opened several opportunities for Jordan to leverage its competitive advantages over other countries in the region through launching several initiatives. These opportunities have significant impact on many sectors ranging from e-learning, through launching Jordan education initiatives and using ICT as a tool to reform education, to e-health initiatives through launching electronic health solutions royal initiative.

ICT sector is becoming the fastest growing sector in Jordan's economy through which its continuous improvements has significant contributions in developing the Jordanian environment in general and developing four main areas in particular: human resource development, technology utilization, socio-economic development and transformation to knowledge economy. Such steps are supported by the vision of king Abdullah II in transforming Jordan to become an important player in the international ICT sector.

4. DATA ANALYSIS AND DISCUSSION

The sample used for this study is a pilot sample to test and validate the instrument used. The sample size was 172 students at a public university. The survey used included three sections, the first included simple demographics. The second section included question related to the students' use of technology and e-government portal utilizing a yes/no type questions. Finally, 6 questions related to the digital divide types were asked with a simple forced answer so the respondents will be forced to choose one of three options: similar, less than or better than. The demographics of the sample are shown in Table 1.

On the other hand, students emphasized a high skill level for using computers (98.8%), high level of computer (94.8%) and mobile phone acquisition (98.3%), and Internet use (91.3%). Also, students indicated that they heard about the e-government portal (90.1%), but did not browse it (19.8%, less using mobiles 6.4%). Finally, 52.3% trust e-government systems, and 62.8% prefer electronic channels.

Table 1: Sample demographics

Gender	Count	%	Residence	Count	%
Male	65	37.8%	In City	99	57.6%
Female	106	61.6%	In Village (rural)	71	41.3%
Missing	1	0.6%	Missing (Not reported)	2	1.2%
Total	172	100%	Total	172	100%

Age	Count	%	Education	Count	%
18 - 25 years	169	98.3%	High School	2	1.2%
>= 26 years	3	1.7%	Bachelor	168	97.7%
Total	172	100%	Master/PhD	2	1.2%
			Total	172	100%

The purpose of this study is to explore students' perceptions regarding the digital divide and its various types. Students were asked to indicate whether each category should have a special level of service or not. Results indicated an equal level perception regarding three categories: geographic divide (rural vs. urban/city areas) (78.5%), gender divide (76.2%), and income divide (68%). Also, citizens with special-needs deserve better services than normal people (52.9%) and educated citizens better than not-educated people (51.2%). Finally, 43.0% of students indicated a similar service to old/young citizens, while 36.6% indicated better service to old ones.

Table 2: The technology and website use

Item	Yes		No	
	#	%	#	%
Do you have the skill to use computers?	170	98.8	2	1.2
Do you own a computer at your home?	163	94.8	9	5.2
Do you use the Internet in Work/home?	157	91.3	15	8.7
Have you heard about the Jordan e-government portal?	155	90.1	16	9.3*
Have you browsed the Jordan e-government portal?	34	19.8	136	79.1*
Do you own a mobile phone?	169	98.3	3	1.7
Does your phone have the capability of browsing the Internet?	131	76.2	40	23.3*
Have you uploaded the "e-gov. portal" application on your phone?	27	15.7	142	82.6*
Have you browsed the e-gov. portal using your mobile phone?	11	6.4	159	92.4
Do you recognize/know any of the services offered by e-gov.?	125	72.7	47	27.3
Have you used such service?	38	22.1	123	71.5*
Do you think that e-gov. services save you time and effort?	114	66.3	9	5.2*
Do you have the desire to benefit from more e-gov. services?	121	70.3	20	11.6
At your neighborhood, do you think that Internet speed is important?	148	86	5	2.9*
Do you trust e-gov. systems?	90	52.3	61	35.5*
Do you prefer the electronic channel to do your business/transactions?	108	62.8	44	25.6*

*Values less than 172 (100%) are accounted for missing answers (not reported in surveys)

5. CONCLUSION AND FUTURE WORK

This study tried to utilize an instrument that measures citizens' perceptions towards the different types of digital divide (geographic, age, gender, income, education, and special needs). Also, a high technology use was portrayed by the sample, but a low e-government portal use was reported. This study pilot tested an instrument for this purpose and tried to check the utility and efficiency of a forced type of questions.

Results indicated that a major consensus was depicted for equal service on three categories: rural areas vs. cities (78.5%), gender (76.2%), and income levels (68%). On the other hand, (51.2%) of sample indicated that better public service should be provided to educated people compared to not-educated people. Similar percentage (52.9%) indicated that citizens with special needs deserve better service than normal citizens.

This study calls for future research to validate the instrument, and generalize findings. Also, it is important to utilize a different type of scale (like Likert scale) and see how Jordanians respond to same issues explored in this study. Finally, the other two types of digital divide (accessibility and knowledge) are equally important, and recall for some future research.

Table 3: The digital divide perceptions

Government should provide a service level at rural areas...					
Similar to cities		Less than cities		Better than cities	
Count	%	Count	%	Count	%
135	78.5	6	3.5	31	18.0

Government should provide a service level for women...					
Similar to men		Less than men		Better than men	
Count	%	Count	%	Count	%
131	76.2	16	9.3	24	14.0

Government should provide a service level for old citizens...					
Similar to young people		Less than young people		Better than young people	
Count	%	Count	%	Count	%
74	43.0	34	19.8	63	36.6

Government should provide a service level for educated citizens...					
Similar to not-educated people		Less than not-educated people		Better than not-educated people	
Count	%	Count	%	Count	%
63	36.6	21	12.2	88	51.2

Government should provide a service level for low income citizens...					
Similar to rich citizens		Less than rich citizens		Better than rich citizens	
Count	%	Count	%	Count	%
117	68.0	17	9.9	37	21.5

Government should provide a service level for citizens with special needs (handicapped)...					
Similar to normal citizens		Less than normal citizens		Better than normal citizens	
Count	%	Count	%	Count	%
76	44.2	4	2.3	91	52.9

6. REFERENCES

- [1] Almarabeh, T. & AbuAli, A. (2010). A General Framework for E-Government: Definition Maturity Challenges, Opportunities, and Success. *European Journal of Scientific Research*, vol.39 (1), pp.29-42.
- [2] Ndou, V. (2004). E-Government For Developing Countries: Opportunities And Challenges. *The Electronic Journal on Information Systems in Developing Countries*, Vol.18(1), pp.1-24.
- [3] Abu-Shanab, E. (2012). Digital Government Adoption in Jordan: An Environmental Model. *The International Arab Journal of e-Technology (IAJeT)*, Accepted and expected to appear in Vol. 2(3) in 2012.
- [4] Costake, N. (2008). General Requirements for Digital Government. A book chapter in "Electronic Government: Concepts, Methodologies, Tools, and Applications" edited by Ari-Veikko Anttiroiko, IGI Global, Information Science Reference, 2008, USA, pp. 98-110.
- [5] Pascual, P. (2003). *E-government, a Report by the Asia Pacific Development Information programme*. Accessed from the Internet in 2009 from: <http://www.apdip.net/publications/iesprimers/eprimer-egov.pdf>

- [6] Abu-Shanab, E. & Al-Azzam, A. (2012). Trust Dimensions and the adoption of E-government in Jordan. *International Journal of Information Communication Technologies and Human Development*, Vol. 4(1), 2012, January-March, pp.38-50.
- [7] Yanqing.G. (2010). E-Government : Definition, Goals, Benefits and Risks. *International Conference on Management and Service Science (MASS)*, 24-26 August, 2010, Wuhan, China, pp. 1-4.
- [8] Riad, A., El-Bakry, H. & El-Adl, G. (2010). A Novel DSS Framework for E-government. *IJCSI International Journal of Computer Science Issues*, Vol.7 (6), pp.33-37.
- [9] West, D. (2005). *Digital Government, Technology and public sector performance*. Princeton University Press, 2005, USA.
- [10] Baase, S. (2009): *A Gift of Fire: Social, Legal, and Ethical Issues for Computers and the Internet*, by Sara Baase, 3rd edition, Prentice Hall, 2009.
- [11] Guanghai, L. (2009). E-Government, People And Social Change: A Case Study In China. *The Electronic Journal on Information Systems in Developing Countries*, vol.38(3), pp.1-23.
- [12] Groper, R. (2004). Digital Government and Digital Divide. A chapter in a book titled "*Digital Government: Principles and Best Practices*", by: Alexei Pavlichev and G. David Garson, IDEA Group Publishing, USA, 2004, pp. 291-305.
- [13] Hanna, N. (2010). Toward a holistic approach to government and social transformation. A chapter in a book titled " Transforming Government and Building the Information Society: Challenges and Opportunities for the Developing World ", by: Nagy K. Hanna, Springer science + business media, USA, 2010.
- [14] Shirazi, F. (2012). Information and Communication Technology and Women Empowerment in Iran. *Telematics and Informatics*, Vol. 29 (2012), pp. 45-55.
- [15] Seckin, G. (2010). Digital Diversity or Digital Divide: An Exploratory Research on Age, Gender, Race and Income: Characteristics of Online Health Information Users. *The International Journal of Diversity in Organisations, Communities and Nations*, Vol. 10(1), 2010, pp. 99-116.
- [16] Minguez, A. M. (2006). New Technologies as Social Fact: Gender and Digital Divide in Spain in Compared Perspective, *ACM*, pp. 1-6.
- [17] Yao, Y. & Okoli, C. (2007). Demographic Differences In Attitudes Toward Remote Electronic Voting Systems. *Journal of Computer Information Systems*, Winter issue 2006-2007, pp 34- 45.
- [18] Subramanian, M. (2007). Theory and Practice of E-Governance In India A Gender's Perspective. *ICEGOV '07 Proceedings Of The 1st International Conference On Theory And Practice Of Electronic Governance*, December 10-13, 2007, India, Digital Library of ACM, pp. 187-195.
- [19] Tobola, C. (2010). Left to Our Own Devices: How Income, Age, and Sex Affect Type and Number of Electronic Devices That Individuals Use *Journal of the Communication, Speech & Theatre Association of North Dakota*, Vol. 22(2009/2010), pp. 31-43.
- [20] Enoch, Y. & Soker, Z. (2006). Age, gender, ethnicity and the digital divide: university students' use of web-based instruction. *Open Learning*, Vol. 21, No. 2, June, 2006, pp. 99-110.
- [21] Redsell, M. & Nycyk, M. (2010). Skilling seniors in computers: community training responses to the digital divide. *Working with Older People*, Vol. 14 (2), June 2010, pp. 38-42.
- [22] Geana, M. & Greiner, A. (2011). Health information and the digital divide. *Journal of Management & Marketing in Healthcare*, Vo. 4 (2), pp. 108-112.
- [23] Eynon, R. (2009). Mapping the digital divide in Britain: implications for learning and education. *Learning, Media and Technology*, Vol. 34, No. 4, December, 2009, pp. 277-290.
- [24] Khan, G., Moon, J., Zo, H. & Rho, J. (2010). Civil Conflict, Digital Divide, and E-government Service Adoption: A Conflict Theory Approach. *World Academy of Science, Engineering and Technology*, Vol. 66, 2010, pp. 537-549.
- [25] Acilar, A. (2011). Exploring the Aspects of Digital Divide in a Developing Country. *Issues in Informing Science and Information Technology*, Vol. 8, pp.231-244.
- [26] Sipior, J. & Ward, B. (2005). Bridging the Digital Divide for e-Government inclusion: A United States Case Study. *The Electronic Journal of e-Government*, Vol. 3(3), pp.137-146, available online at www.ejeg.com.
- [27] Hill, R., Owens, I., Beynon-Davies, P. & Williams, M. (2004). Beyond Access: Bridging The Digital Divide. *European Conference on Information Systems ECIS 2004 Proceedings*. Paper 61. <http://aisel.aisnet.org/ecis2004/61>.
- [28] Helbig, N., Gil-García, R. & Ferro, E. (2009). Understanding the complexity of electronic government: Implications from the digital divide literature. *Government Information Quarterly*, vol. 26(1), pp. 89–97.
- [29] Orbicom (2005). From the Digital Divide to Digital Opportunities Legal deposit - National Library of Canada, 2005. Online http://www.itu.int/ITU-D/ict/publications/dd/material/index_ict_opp.pdf

- [30] Baker, P. & Panagopoulos, C. (2004). Political Implications of Digital (e) Government. A chapter in a book titled "*Digital Government: Principles and Best Practices*", by: Alexei Pavlichev and G. David Garson, IDEA Group Publishing, USA, 2004, pp. 97-115.
- [31] Savic, N. & Radojicic, Z. (2011). Digital Divide in the Population of Serbia. *Issues in Informing Science and Information Technology*, vol.8, pp.245-258.
- [32] Comunello, F. (2010). From the Digital Divide to Multiple Divides: Technology, Society, and New Media Skills. A chapter in a book titled " Handbook of research on overcoming digital divides : constructing an equitable and competitive information society ", by: Enrico Ferro, Yogesh Kumar Dwivedi, J. Ramon Gil-Garcia & Michael D. Williams, Information Science Reference (an imprint of IGI Global), USA, 2010, pp.588-605.
- [33] Hermana, B. & Silfianti, W. (2011). Evaluating E-government Implementation by Local Government: Digital Divide in Internet Based Public Services in Indonesia. *International Journal of Business and Social Science*, Vol. 2 (3), pp. 156-163.
- [34] UNDESA (2010). United Nations E-Government Survey 2010, Leveraging e-government at a time of financial and economic crisis. Accessed from the Internet from: hdr.undp.org
- [35] Dewan, S., Ganley, D. & Kraemer, K. (2005). Across the Digital Divide: A Cross-Country Multi-Technology Analysis of the Determinants of IT Penetration. *Journal of the Association for Information Systems* Vol. 6 No. 12, pp. 409-432.
- [36] Billon, M., Lera-Lopez, F. & Marco, R. (2010). Differences in digitalization levels: a multivariate analysis studying the global digital divide. *Rev World Econ*, Vol. 2010 (146), pp. 39-73.
- [37] Ottoum, I. & Suleiman, R. (2011). E-Government – The Jordanian Experience. Proceeding of The 5th International Conference on Information Technology, Amman, Jordan, may 11-13.