

## PUBLIC SECTOR TECHNOLOGIES

**THE IMPACT OF E-GOVERNMENT  
IMPLEMENTATION ON THE  
ORGANIZATIONAL STRUCTURE: THE  
CASE OF JORDAN**

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**Abstract:** The application of E-government initiative in Jordan had widely spread milestones in terms of achievement, these achievements has changed the means of communication between the government different ministries and directories through websites. This research studied the level of E-government application and the changes in the organizational structure needed to reach the optimal customer service. Data collected through the interview with personnel in the Ministry of Information and Communication Technology and Electronic Government Program from, the websites of the Ministry of Education and the Income and Sales Tax Directorate, and the United Nations E-government Readiness Biannual Report.

This study found that the E-government application level is conventional with some utilization in the vertical integration, and the effect on the structure is not clear except for the new technology-related positions that have emerged due to the changes in the communication methods

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### Introduction

Citizens are demanding their governments and administrative institutions to be efficient in using the limited resources available due to the current economic conditions experienced worldwide, the rapid population growth, and the increasing awareness of citizens of their rights and responsibilities in light of what is known as the state institutions and law, breadth of experience and knowledge due to the tremendous advances in the information and communication technology, citizens are demanding their governments and administrative institutions to be efficient in using the limited resources available (United Nations Department of Economic and Social Affairs, 2010). Hakken (2010) argues that the public sector is expected to be transparent and more assume responsibility in being held accountable to the citizens for the achievement of broad governmental goals, and to search for better ways to manage services and government institutions.

Al Azzam (2001) explains the goals of the e-government initiative in Jordan is to increase the productivity of the public sector for the purpose of having greater ability to control the available resources and to reduce waste, costs, and time required to provide the services and consequently reduce the budget deficit which should reflect positively on the Jordanian economy. Due to the increased dependence on information systems and technology by organizations, most of today's firms and governments have plans to implement information technology and E-government in processing and communication activities (Alsohybe, 2007; Laudon and Laudon, 2012). The focal point on government reform has been synchronized with the emergence of new technologies. These trends have encouraged a narrower combination of work processes and information flows across organizational boundaries (Dawes and Eglene, 2004). The Jordanian government is trying to find the appropriate e-government model to enhance the economic growth and to provide the people with the best and fastest services possible.

### *Research objectives*

The purpose of this research is to understand the effect of applying E-government on the organizational structure, determine if restructuring will be needed for applying different levels of E-government. Public organizations need to restructure their back office procedures and their organizational structure since they require to move from hierarchical organizations to flat organizations (Bannister, 2001). Since the launching of the E-government initiative in Jordan, there has been slow but noticeable changes on the means of communication between the government as a service provider and the citizens as the customers, though the effect of those changes in the governmental structure was not clear (Alomari, 2006; Al-Omari and Al-Omari, 2006; Alomari, Woods and Sandhu, 2012). This research will look into the level of application of E-government and the changes in the organizational structure needed in order to reach the optimal customer service.

### *Problem statement*

Given the importance of information technology and the Internet that facilitate the tasks of all the different sectors, e-government has become part of the electronic application of this concept in the public sector. The problem of the research is "how the different levels of applying E-government affect the organizational structure". This could well be answered by the following research questions:

1. How different are the levels of the actual application of e-government in the researched organizations?
2. How do organizations change in response to the level of e-government application?

### *Significance of the study*

The study sheds light and helps understand the level of application of e-government as well as understanding the resulting changes in the structure

that needed for improving the services provided to citizens. In addition, there are not many academic articles on issues related to the experience of the e-Government in Jordan and relationship to the organizational structure in government units.

## Theoretical Background

### *E-government*

Burn and Robins (2003) define e-government as "the provision of information and services provided by governments to citizens, using a range of information and communication technologies", while Li (2007) defines E-government as "a web-based project to enhance communication between the government and citizens, business partners, employees and other agencies, and information publication from the authority". On the other hand Chatfield and Alhujran (2009) define electronic government as "the rapidly emerging global phenomenon of the use of information and communication technology (ICT) as the new way forward in public administration". The definition for E-government that is adopted in this study is the use of information and communication technology to facilitate internal and external interaction and service providing for users and customers.

E-government includes different models namely: government to customer (G2C), government to business (G2B), and government to government (G2G) as defined by Reddick (2004). As far as this study is concerned, the term citizen or customer is used in both G2C and G2B models. E-government will be measured using the UN biannual E-government survey for 2008 and 2010, where the survey measures the E-government readiness through several measures; E-government index, E-participation index, and E-inclusion index:

*E-government index* is a composite index that is measured by different components which are; Web measure index (online presence and E-services provided), the Telecommunication Infrastructure index (measures infrastructure indicators using the following measures: PC's/1000 persons; Internet users/1000 persons; Telephone Lines/1000 persons; Online population; Mobile phones/1000 persons; and TV's/1000 persons) and the Human Capital index (is based on the positive link between low human capital and E-government Development; with higher education and skills they are more likely to embrace technology quickly and efficiently). The *E-participation* is measured by the citizen participation electronically with the E-government. E-inclusion index is the participation of the citizens in the E-government, by empowering and restructured thinking (Capgemini, 2006).

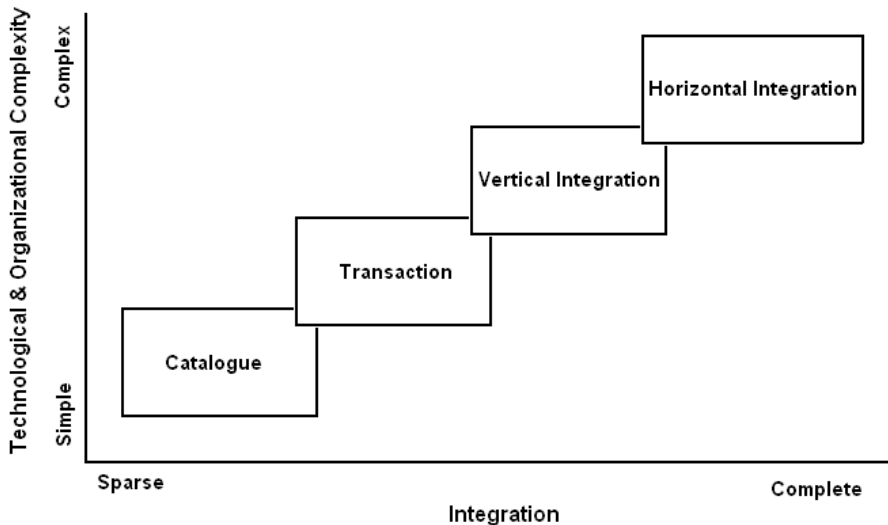
### *Level of application of E-government*

The level of applying E-government is adapted from Layne and Lee (2001); where the study defined a four stage model for applying a fully functional E-government namely; cataloguing, transaction, vertical integration, and horizontal integration.

1. The first level; cataloguing is by creating a governmental presence on the internet that contains the governmental information where the citizens can download the necessary forms for non-transactional information (government services and procedures).
2. The Second level is transaction, where the government focuses on having an online interface to interact with the citizens. The customer would then be able to query and complete transactions through the live database linked to online interfaces to minimize the interaction with governmental employees. On the other hand, the employees will also have online access to be able to make a query about their personal information (i.e. Payroll, and Online Training).
3. The third level is integration, and it's in turn divided into vertical and horizontal; the vertical integration within the same governmental agencies or departments to enable the completion of a service or function (automation of full service or function). While horizontal integration across different functions or services across different governmental agencies or departments, along with redesigning the services and functions which leads to organizational changes.

There is some overlapping between the different levels; nevertheless, the application of each level depends on the previous level as demonstrated in figure 1. The level of application is measured by the type of functionalities involved in each stage based on Layne and Lee's (2001) definition.

FIGURE 1. DIMENSIONS AND STAGES OF E-GOVERNMENT DEVELOPMENT



### *Organizational structure*

The organizational structure defines the workflow and interactions within the organization (Peters, 2001). It shapes the service it provides to the customers while adding technology to the mix. The study investigates how the different level of applying this technology will affect the organizational structure.

The organizational structure is what defines the levels of hierarchy, the level of decision making, level of delegation, and the reporting relationships (Surinder, 2006). According to Lee (1964); organizational structure is what defines the operational procedures, the managerial information/decision flow, employee distribution, and job description. This study considers the organization structure as what determines the number of levels of hierarchy, operational procedures, job description of employees and the relations between the employees in different levels.

Different types of organizational structure cannot be separated from the style of management, as one determines the other. Examples of different types of structure might be; entrepreneurial, bureaucratic, functional, divisional, matrix and organic structure. Although, bureaucracy is most common with governments around the world (Liu and Li, 2006), there is some room for functional teams either cross-hierarchical or cross-functional.

In accordance with the adopted definition, the organizational structure will be measured by the organizational chart of the government that reflects the number of levels of hierarchy, operational procedures, and information /decision flows.

The organizational structure is affected by different factors. From the adopted definition of E-government, it's the use of technology in order to provide service, therefore it is clear that the application of E-government will affect the organizational structure, but it is unclear as to what extent effect might be.

### Literature Review

The E- Government is a need for the countries with good telecommunication infrastructure, though, the steps forward in Jordan have taken its time, with some problems in legislating the laws needed for the application that have held back the progress (Al-Shboul and Alsmadi 2010). On the other hand, the structure of the governmental institutions should be able to reflect the changes introduced by the application in accordance with the level of E-government applied. This might show in clarification of the roles, responsibilities and how it provides a clear guideline for the processes. This study attempts to test this relationship and assessing the level of application in accordance with the four stage model proposed by Layne and Lee (2001).

The study of Al Azzam (2001) entitled "Electronic Government in Jordan: Potentials for Implementation" has concluded that the electronic government is a hot issue in public administration all over the world and it is a necessity

rather than a luxury issue in order to face the new life challenges. As for the case of Jordan, Al Azzam (2001) considered that the e-government project is moving forward and it is well supported by the country's leadership because it enhances democratic practices such as transparency, accountability and sharing of decision making. Most of Jordanian government departments were reported have computerized it's working, but the level of work computerization varies, especially in the introduction of services, according to the level of technological infrastructure available and other financial limitations. As for the laws and regulations, they are still the major obstacle to e-services introduction for most of the Jordanian government departments. The communication issue between the Jordanian governmental departments (included in the study) and the main sponsor of e-government (the ministry of Telecommunications and Information Technology) is not clear as related to the distribution of responsibilities of who should carry out the whole transition to e-government).

Al-Sayalah's study (2006) entitled "A Model for Electronic Government in Jordan and its Application to the Case of Driving License and Vehicle Registration", aimed at investigating the implementation of e-government in one public directorate namely the Driving License and Vehicle Registration. Based on the results of the survey of users, a number of business process models were proposed for executing the work such as using the internet for obtaining driver licenses, for registering vehicles and also for the payment of due fees.

Similar to a study by Navarra (2006), Al-Omari's study (2006) entitled "E-Government Architecture in Jordan: A Comparative Analysis" explained the architecture for the E-Government system; its main concepts, objectives, most common applications, famous worldwide experiences (e.g. USA, UK and Singapore) and the E-Government in Jordan. It proposed a simplified model for some of the Jordan E-Government Portal Online services.

Another study by Elsheikh et al. (2008) entitled "E-Government in Jordan: Challenges and Opportunities" reported the challenges encountered in E-Government implementation, as well as the potential opportunities experienced in the context of a Jordanian society following an extensive examination. The understanding of the current status of E-Government in Jordan would help policy makers in the country to pursue development of the public sector organizations on the one hand, and would be generally of importance for Jordan's economic future success on the other. However, the findings and implications of this study revealed that Jordan is still far behind other countries in utilizing ICTs for delivering government services online.

### Problem definition

The problem of this study can be divided into two sub-problems - application of E-government and the organizational structure.

#### **The level of application of E-government**

This part will compare the level of application of E-government in accordance with Layne and Lee's (2001) proposed four stage of E-government

application (catalogue, transaction, vertical integration and horizontal integration).

*Hypothesis 1:*

The level of application in Jordan is still in the transaction stage of fully functional E-government.

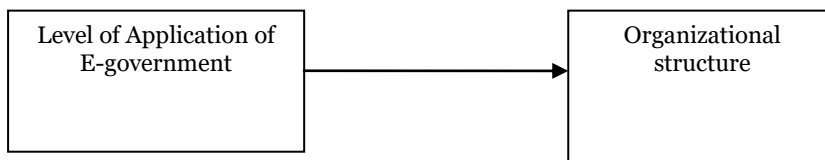
**The organizational structure**

The organizational structure is affected by the level of E-government application

*Hypothesis 2:*

The change to the organizational structure reflects the level of E-government application.

FIGURE 2. THEORETICAL FRAMEWORK



**Research methodology**

This section describes the methodology that is followed and addresses the hypothesis testing required to answer the research questions. The study uses a descriptive research methodology in order to be able to describe the reality, with more room for analysis in accordance with the observations and interviews. The hypotheses of the study are not tested based on quantitative data.

*Research Design*

For the purpose of this study, the focus is on observations of the websites as related to published news from the Ministry and through interviewing some of the employees that were responsible for the E-government program in the ministry.

*Population and sample*

The population for this study includes all the ministries of the Jordanian government. The sample for the purpose of the study was constrained by the

availability of those concerned employees who were later interviewed in the ministry of education and Income and Sales Tax Department. The issue of obtaining access was a major hurdle that naturally would compromise the findings of the empirical research.

### *The research instrument*

The interview was the main instrument for data collection. This was carried out with some personnel in the Electronic Government Program at the Ministry of Telecommunications and Information Technology and. On the other hand, there were some observations of contact points with the citizens (on different websites).

### *Procedure for data collection*

The data for this study was collected from the Jordanian E-government portal (<http://www.jordan.gov.jo>), and also from the Income and Sales Tax Department site (<http://www.istd.gov.jo>), as well as the website of the Ministry of Education (<http://www.moe.gov.jo>) for the services given through their website to determine the E-government level of application. The official organizational structures of the ministries, the United Nations E-government Readiness Report and pre-scheduled interviews were made use to triangulate the data.

### *Data analysis and interpretation*

The data analysis was based on grouping related data and comparing it with the models for both hypotheses.

### *Results and Discussion*

The findings are listed below that is meant to serve providing answers to the research questions for each of the hypotheses:

#### *Results and discussion pertaining to Hypothesis 1*

The United Nations conducts a biannual E-government survey, which includes a section for E-government readiness. The survey includes 191 members of the UN and compares them using their websites and e-services offered. The measurement of the index is done using two measurements; E-government readiness and E-participation. In 2010 the E-government development index value was 0.5278 and ranked 51 compared with the index value of 0.5480, a rank of 50 for the year 2008, and the 15th among developing countries in 2010. One can readily notice a decline in scores of all world countries in the 2010 survey which could be attributed to the international economic crisis, where the world average index was 0.441.



The online service and its component's index value for Jordan in 2010 was 0.5333 and ranked 22 compared to world average of 0.286. Visiting Jordan's E-government and the Ministry of Education's websites, it is clear that there were service forms and service instructions available. The websites also included feedback from visitors on government policies and services to increase the visitor's participation.

E-participation index value for Jordan in 2010 was 0.2857 with a rank of 42 compared to index value 0.5455 and a rank of 15 compared to that of 2008. The decrease in index value could be attributed to the method used for calculating the index; compared with the 2008 index, it was higher than the world average index for 2010 which was 0.205. The Information Technology infrastructure index value for Jordan in 2010 was 0.181 compared to the 0.236 world index value, and the index value was 0.1693 in 2008. However, Human Capital index value for Jordan in 2010 was 0.869 compared to 0.797 world average, and to the value of 0.8677 in 2008. The websites allowed customers to track services and request them via mobile SMS or email and any additional requests were reported back. There are currently more than 20 services that can be requested via SMS.

The Ministries' websites encourage the participation and includes email communication, and some E-government services that can be queried through the national contact center for government services. There were limited online payment facilities through prepaid payment cards, account to account transfer or credit/debit card. The Income Tax could be performed using the internet access while submitting the information required using an online form and payment of due amount could be made using online banking (account to account transfer or credit/debit card). The Ministry of Education initiative allows the use of prepaid cards for school graduating students in order to submit online forms for government university acceptance. The Ministry of Education's website offered the facility to contact any school in Jordan and it has the E-learning initiative using the EduWave as a tool to facilitate learning by students and their interactions with the teachers. The latter have the ability to submit their mark charts for students using EduWave as well. There was an online service for transferring students from one school to another (approvals required from both schools).

TABLE 1. SUMMARY OF UN E-GOVERNMENT READINESS INDEX

Index name	2010			2008	
	World average	Index value	Index rank	Index value	Index rank
E-Participation	0.205	0.2857	42	0.5455	15
Human Capital	0.797	0.869	-	0.8677	-
Online Service	0.286	0.5333	22	-	-
IT infrastructure	0.236	0.181	-	0.1693	-
E-government Readiness	0.441	0.5278	51	0.548	50

The Income Tax could be performed using the internet access with the submission of the required information using an online form and the payment of the due amount using online banking (account to account transfer or

credit/debit card). Nevertheless, there are some legal implications limiting the progress in the transformation of E-government. For example, the E-signature is not adopted and scanned copies are not acceptable in governmental interactions, neither with citizens nor with other governmental authorities.

According to the findings as reported earlier and the definition of the levels of applying E-government, the government has successfully made cataloguing. The governmental information is available for customers where they can download forms and learn about the procedures.

The second level, as defined previously, include the online interface to interact with customers, which is divided into two parts; query for both the internal user (employees) and external users (visitors) through the online database, the facility is not fully available online, but there are some queries that are completed using the SMS.

The third level of application is vertical integration meaning the automation of full services or functions. The full automation by completing transactions online has limited applications in accordance with the findings (income tax, transferring students and submitting the students' marks to the ministry).

The final level is the horizontal integration which is the integration across functions and services through different governmental departments with the redesigning of the services and operations; No application was used to indicate attaining\and working at that level.

### *Results and discussion pertaining to Hypothesis 2*

The organizational structure as outlined in their organizational charts were a typical bureaucratic hierarchal structure. The government has increased the number of computers in the different ministries and departments at all levels. Every ministry has a website dedicated to it. There have been different courses and training sessions for employees to be familiar with the new installed computers and systems. The the organizational structure and organizational procedures had no clear changes made to them. More citizens are using the websites dedicated to leave their inquiries, complaints and learn more about procedures (forms and documents needed). However, it was noticed that there was an E-government plan for change management that was made in February 2007, which was applied to introduce the electronic changes that were related to the internal changes within the organization (structure, culture, organizational structure and internal operations). Some newly established positions due to the automation of some of the organizational procedures were created.

According to the findings as reported previously, and based on observation and access to the websites of the Ministry of Education and the Jordanian E-government portal, there was no clear change in the organizational structure, but there has been some additions in terms of new positions to facilitate the application of E-government at the current stage. It is important to keep in mind that there was a change management plan available that is made for the time of the automation of the operations which included all the organizational factors; the organizational structure, culture, procedures and services restructuring.

## Conclusion and Recommendations

This part presents the conclusions of the study, the recommendations and suggestions for research. The level of application of E-government was estimated to be between the second and the third levels; transaction and vertical integration, although it was closer to the transition phase but there were some initiatives in the integration phase. Therefore, the impact on the organizational structure was not clear except for the new technology related positions that have emerged due to the changes in the communication methods.

The change management plan was very broad and had no changes since it was written in early 2006. This plan could have been more useful had it been made more specific and tailored for each ministry and its related directories since the impact of E-government would affect all levels in the organization but in different proportions and in accordance with the job descriptions.

The E-government full implementation still awaits the legislation of two laws; the acceptance of the use of E-signature and scanned documents for the completion of governmental transactions. If these two laws are legislated they are expected to have an effect on the completion of the E-government program.

Further detailed research can be carried out on the effect of E-government on the different jobs in the organizations, on the organizational culture, on the services and restructuring transactions, and on the level of customer's acceptance and satisfaction with the E-service. In addition, some important studies on the integration of different divisions in different ministries for offering a service and how can that be done with synergy might be also executed. Furthermore, further research related to future cost cutting/saving of fully functional E-government and the effect of E-government on job retention and security for governmental employees can be carried out.

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