AN EVALUATION OF E-GOVERNMENT SERVICE QUALITY AND THE IMPACTS OF CLOUD COMPUTING ON GOVERNMENT SECTOR IN OMAN

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ABSTRACT: The revolution in Internet has changed our world in many ways. The resultant effect comes as no surprise that, it naturally effects on the way government functions in terms of the organization, its relationship with its citizens, institutions, businesses and cooperation with other government bodies. This rapid change forces and challenges the government to develop efficient and effective systems that address both global and local needs. Hence, as a major step to development, His Majesty Sultan Qaboos Bin Said has emphasized the importance to adopt e-government and encourage the public to use e-services instead of traditional ways. For the very reason, His Majesty has set an award every two years, allow the institutions to participate and give them a chance to develop their current e-services. Today, the adoption of e-government has increased however, the level of success and His Majesty's vision which is to transform Oman into a digital society, hasn't achieved yet.

The purpose of this paper is to evaluate e- government quality services of the government sector in Oman and identify the factors as well as challenges that effect the adoption of e-government, there by enhances the e-services of those projects and improves the development process of e-government adoption. This paper evaluates the external and internal competitive advantage by using the well-known strategic analysis tools and frame works and discussing the effects of using Cloud Computing to help to achieve the objectives and fulfill the vision and suggest recommendation based on the results of this paper.

KEYWORDS: ICT- Information and Communication Technology; Obstacles; E-government; adoption; Oman; E-Service Quality, E-Government Stages, Cloud Computing.

INTRODUCTION

Today ICT is considered as one of the fundamental building blocks of modern societies and digital economies (Castells, 2009; Varian et al., 2005). Many applications of ICT over the past few decades have shown its transformative potential and its usage as an important tool for organizing political dissent in countries worldwide (Hirschfeld, 2012; Reddick, 2010; Serageldin, 2011). From a government perspective, e-Government adoption has become a must for leading a successful e-Governance. This is because of the increase generalization of technology access by citizen and organizations bring expectations and pressure on government.

However, the goal of e-Government is to make the transactions go more smoothly by offering an increased portfolio of e-services to citizens in an efficient and cost effective manner. These e-Services not only can drive the growth of the economy and government productivity, but also

gives awareness programs for their citizens such as, online enquiries, submissions for regulatory or funding purposes, or even for collecting or distribution information about the governments.

Quality of service is the ability to provide different priority to different applications, users, data flows, or to guarantee a certain level of performance. Governments need to keep up with the transparency, ease of navigation and comprehensive information, because often the main concern in governments is to deliver the quality of the service and how the level of satisfaction with service delivery affects trust in public. However, most modern democracy suffers from a declining level of trust in government. It is important to note that increasing the quality of public service will increase the trust in government.

Cloud computing provides a new service consumption and delivery model inspired by Consumer Internet Services. E-Governance with cloud computing offers integration management with automated problem resolution, manages security end to end and helps budget, based on actual usage of data. At a global level, cloud architectures can benefit government to reduce duplicate efforts and increase effective utilization of resources.

AIM OF THIS PAPER

Despite his majesties emphasis on adopting e-Government services, there is still more readiness needed to deliver e-Services, therefore reduced success have been achieved till now. This paper aims

- To analyze the issues from different angles and study the status of e-Government and the services offered in terms of quality,
- To highlight the importance of implementing cloud computing to support and design the applications and services model ready for integration,
- To expand the usage of e-services to realize the full benefits of e-government,
- To clarify the factors that effect on the development of e-Government services quality and it's success,
- To evaluate e-Government services quality and the pros and cons of using Cloud Computing in government sector in Oman.
- To suggest recommendations to solve these obstacles in an effective approach.

RESEARCH METHODOLOGY

It is known that research methodology is very important to properly support the researcher in collecting the needed data for his study to achieve the research objectives and make the best business decisions. The methodology includes publication research, interviews, surveys and other research techniques. Data is analyzed using both qualitative and quantitative format. Quantitative data deals with numbers and statistics and results in numerical and standardized data by using of graphs and diagrams. While, qualitative data is more to do with feeling and emotions that are expressed by respondents. They are analyzed by sorting the data collected into various themes or categories. This means Multi-method data analysis has been used which includes both multi-method quantitative studies as well as multi-method qualitative studies.

Another type of data analysis technique that is used in this paper is the mixed method technique where both qualitative as well as quantitative data is analyzed through various methods. The mixed method data analysis technique is very useful as it enables triangulation. Triangulation can improve the validity and reliability of the study by validating the results by using two or more techniques of data analysis.

Also, this paper analyzes the data captured from online surveys and questionnaires, which has been distributed to the target citizen, employees and managers who involved in e-governance projects. Further they have also been distributed to other government organizations, which play a major role in e-government projects.

E-GOVERNMENT CHALLENGES

ICT infrastructure: Challenges such as e-readiness, computer literacy and telecommunication equipment. How ready the organization is very important to assure that, it is prepared to respond to any disruption of its day-to-day operations. But, too often, most organization fail to take effect, probably because they rush to implement e-learning thereby many organizations are making unfortunate mistakes. Also, having the education, freedom and desire to access information is important to e-Government effectiveness. Presumably, the higher the level of human development, the more likely citizens will be inclined to accept and use e-Government services.

Policy issues: Challenges such as in legislation. Processing of e-Government principles and functions requires a range of new rules, policies, laws and legislative changes to address electronic activities including electronic signatures, electronic archiving, freedom of information, data protection, computer crime, intellectual property rights and copyright issues. Dealing with e-Government means signing a contract or a digital agreement, which has to be protected and recognized by a formalized law, which protect and secure these kinds of activities or processes. E-business and e-government laws are not yet available.

Human capital development and lifelong learning: Challenges such as in skills, capabilities, education, learning. A major challenge of an e-Government initiative is the lack of ICT skills in the public sector. This is a particular problem in developing countries, where the chronic lack of qualified staff and inadequate human resources training has been a problem for years (UNPA&ASPA, 2001).

Change management: Challenges such as in culture, resistance to change. This resistance could be from the Government agency employees and the citizens. Employees resist change because: They fear of losing their jobs due to losing power over electronic transactions, IT employees might lack the required skills to use the new technology because of the age or level of education could be the reasons affecting in the e-transformation, or some employees got into a habit or used to do work at a certain way that change for them means changing their life style.

Understanding of e-Government: challenges such as in E-government still perceived as simple IT project with no implications on process of service delivery. Some past experiences with computerization of ministries may cast shadow of doubt on e-government.

Partnership and collaboration: challenges such as in public/private partnership, community and network creation. Governments often show some resistance to open and transparent systems as

they try to preserve their authority, power and hierarchical status. For example, the ICT private sector will support government with technical skills and infrastructure; while, universities will provide the required staff, learning and training courses for government staff and citizens, and other governmental departments and agencies can contribute in data and information flow and knowledge sharing for problem solving of similar tasks or processes and so on. A 'new' development model is emerging that focuses on partnership among stakeholders in the knowledge-based development program (Talero & Gaudette, 1996).

Leadership role: Challenges such as in motivate, involve, influence and support. Changing and hazy visions confuse expectations for reforms and leaders (OECD, 2001). Because e-Government is a complex process, accompanied by high costs, risks and challenges, government organizations are naturally will be resistant to change at first, that's why having a leading player who is able understand the real benefits of the project, to motivate, influence, include and support other organizations and institutions, is required. Top leadership involvement and clear lines of accountability for making management improvements are critical to overcoming organizations' natural resistance to change, marshaling the resources needed to improve management, and building and maintaining the organization wide commitment to new ways of doing government (McClure, 2001).

Funding: Challenges such as in funding the full range of initiatives in order to achieve the objective of the e-Government for example: employees salaries, buildings rent, IT projects and other facilities.

Privacy and security: Challenges such as citizens have a fear of getting their personal information viewed or manipulated online by inappropriate parties using illegal ways.

E-GOVERNMENT SOLUTIONS

According to Backus, "the three main target groups that can be distinguished in e-governance (we call it e-Government) concepts are government, citizens and businesses/interest groups. The external strategic objectives focus on citizens and businesses and interest groups, the internal objectives focus on government itself" (Backus, 2001). E-governance provides the common solutions and direction in the implementation of government policies for the following: (see Table 1)

GOVERNMENT STAGES

The more attention increases on adopting e-government, the more needs to determine the stages in e-government have to be clarified in order to identify the requirements of the e-government adoption in each stage to achieve the success.

There are six-stage model involving: e-Presence, Interaction, Transaction, Transformation, e-Participation, and e-Border/e-Regional. So, in order to achieve their objectives that are mentioned earlier they need to follow these 6 stages as shown in Fig 1. They also need to inform the government agencies to start immediately implementing the stages and to be achieved according the deadlines.

Table 1 : E-Governance Solutions

	External:G2C	External:G2B	Internal:G2G
Phase 1 Information	Local/Departmental/National Information (mission statements and organizational structure , addresses, opening hours, employees, telephone numbers, law, rules and regulations Petitions Government glossary News.	Business information, addresses, opening hours, employees, telephone numbers, law, rules and regulations.	Knowledge base (static intranet) knowledge management (LAN)
Phase 2 Interaction	Downloading forms on websites, submitting forms, online help with filling in forms, intake processes for permits etc, email, newsletters, discussing groups, polls and questionnaires, personalized web pages notification.	Downloading forms on websites, submitting forms online, help filling in forms (permits), intake processes for permits etc, email notification.	Email Interactive knowledge Databases Complaint handling tools
Phase 3 Transformation	Personalized website with integrated business account for all services.	Personalized website with integrated business account for all services.	Database integration

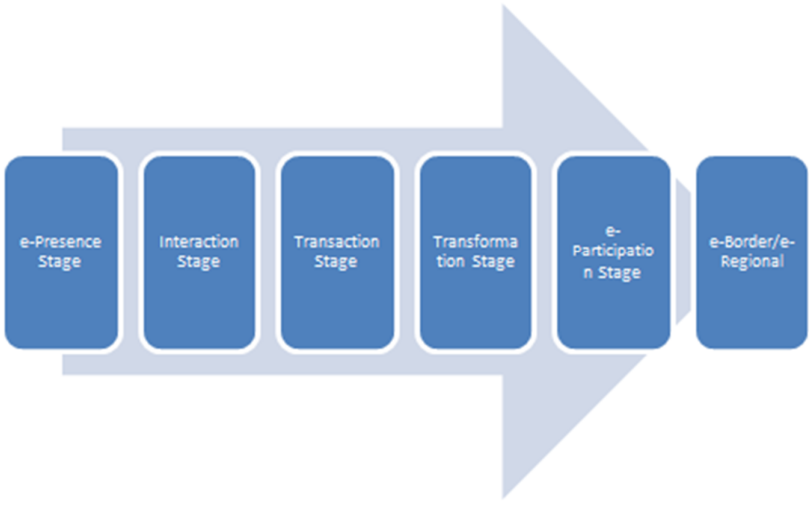

Fig 1. E-Government Stages

ANAYSIS AND FINDINGS

The first stage of the data analysis consisted of checking the responses and tagging them with a unique number. The authors generated the descriptive statistics (percentage and tables) and used Regression analysis by utilizing SPSS (Version 15.0). Descriptive data analysis provides the reader with an appreciation of the actual numbers and values, and hence the scale that researchers are dealing with (Dwivedi and Weerakkody, 2007).

The Demographic characteristics

Gender

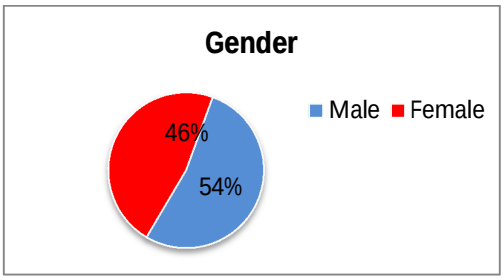

Fig 2. Gender Distribution

From the chart as shown in Fig 2, determining gender is based on a questionnaire which was distributed to a total of 250 respondents of e-Government services users. As is obvious from the chart above, the gender divide is a little inclined toward males by 54%, while females by 46%, this means male responses outnumbering female responses by 8%. Analyzing gender helps to determine how serious or readiness each gender in taking the role or responsibilities to improve e-services. The chart above shows the number of female responses is less than males, this result might not be so accurate due to the possibility of female absence when the questionnaires were distributed (e.g vacation, etc). Therefore, the gender estimation could be underestimate to determine the important relations.

Age

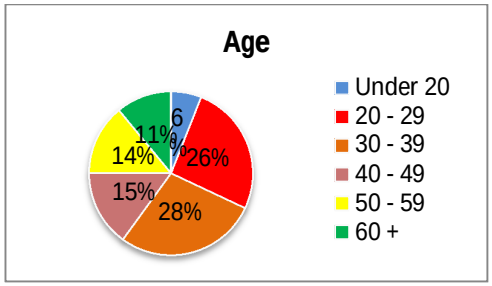

Fig 3. Age group

From the chart as shown in Fig 3, we can see that group age between 20-29 and 30-39 years have a higher tendency to use online government services compared to other age groups by 26% and 28% of respondents, with only 2% differences. Followed by the second higher group age between 40-49 and 50-59 of respondents by 15% and 14%, with only 1% differences. While the less percentage goes for group age 60 + by 6%, where generally older people spend significantly less time surfing the internet than younger. Therefore, we can determine from this chart that the group age of e-service users mostly depend on the experience age for each user and the skills developed during their life.

Education

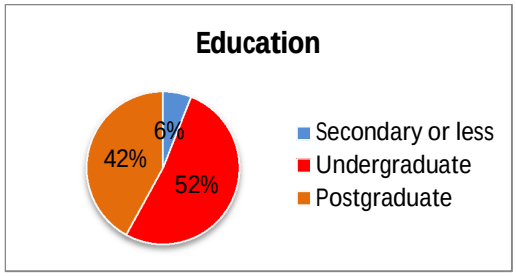

Fig 4. Education level

From the chart as shown in Fig 4, the educational level of the respondents, and as we can see those who completed their secondary school or less got the lowest percentage by 6%. While the highest percentage goes to the group who completed their undergraduate (e.g: all academic programs up to the level of a bachelor's degree) by 52%, followed by the 2nd highest for the group who completed their postgraduate (e.g: masters or PhD) by 42%, with 10% differences between the two educational levels. This chart indicates that, the more educated the user is, the more likely he/she will be using online government services.

Job Sectors

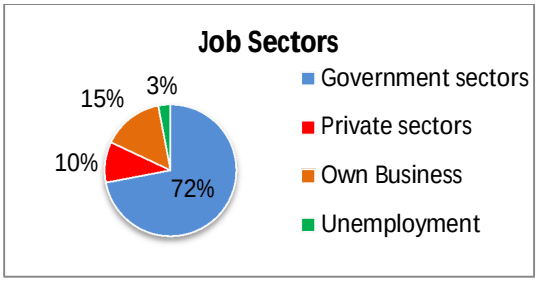

Fig 5. Job sectors

From the chart as shown in Fig 5, it shows the job sectors of the respondents, and as you can see the highest percentage goes to who work in the government sector by 72%. The second and third

highest percentage goes for respondents who have their own business and who work in private sectors, by 15% and 10%, while unemployment users are likely to use less of the e-services by only 3%. We can also indicate from this chart that government sectors got the higher chances to get training or courses in using online services.

Income

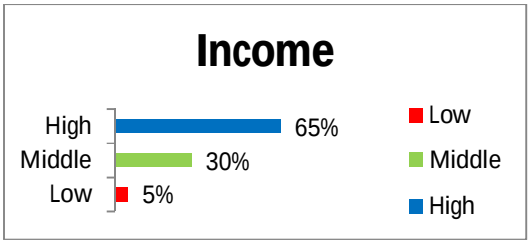

Fig 6. Income group

From the chart as shown in Fig 6, it shows the income levels of the respondents, ranging as high, middle and low. As you can see the respondents who have a higher level of income are more likely to use government e-services by 65%. Next comes the respondents who have middle income level by 30%, and last by only 5% makes it the less respondents who use government e-services.

Computer and Information Literacy

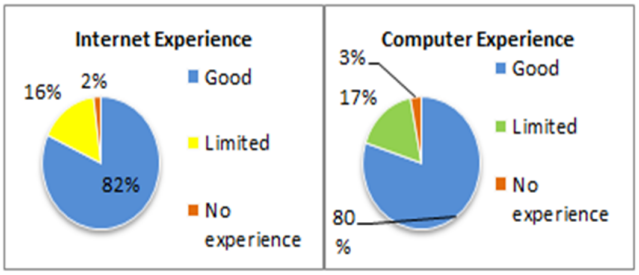

Fig 7. Computer information Literacy

From the chart as shown in Fig 7 , the majority respondents have a good level of internet experience by 82%, which makes it the highest percentage. Followed next by 16% of respondents who have limited level of use, and last by 2% of users who have no internet experience at all. While in computer experience chart, the majority of respondents have a good level of internet experience by 80%, followed next by 17% of respondents who have limited level of use, and last by 3% of users who have no internet experience at all.

CONCULSION

This paper highlighted the different stages of e-government adoption, advantages and challenges to successful adoption of e-government system. It is obvious that e-government involves multiple

stages or phases of development and it has many advantages to the governments, citizens and business. However, the adoption of e-government is not an easy job, it faces many factors that can affect the citizen in adoption of E-Government services in Oman, which we have discussed in this paper. Regardless of how Oman is considered doing well in terms of ICT infrastructure and deployment, many technical and non-technical challenges are faced in the adoption and dissemination of e-Government. Also, we would like to point out that according to the data analysis results, it shows that the main e-government users concern is about inadequate security and privacy safeguards in electronic networks in which it can lead to distrust in applications of e-Government that might pose risks, such as through unwarranted access to sensitive personal information or vulnerability to online fraud or identity theft. Such concerns can be a major impediment to the take-up of e-Government services in terms of how reliability and responsiveness the services. Nevertheless, the majority of respondents of e-Government services users are generally quite satisfied with the quality of the e-service, but need to increase user satisfaction and trust in e-services.

RECOMMENDATIONS

The followings are recommendations that implementing agencies needs to focus on, in order to overcome the current challenges that effect on the adoption of e-government that enhance the e-services quality of the projects and improve the development process of e-government adoption:

Strategic Direction

1. To set clear national objectives and should be supervised on a high level by the board of ministers. The objectives or targets must be reviewed annually by the board.
2. To have a centralized management in order to supervise the exchange of data between the government entities and given the authorities to collect and transfer data. To form a higher committee to decide on the issues of data sharing in government entities and considered it on a national level which would help to simplify procedures and services delivery.
3. Each government organization should define their e-government objectives and to be supervised by the top management in the organization: the objectives should be in line with the national targets and to be shared with the organization staff and reviewed annually by the top management.
4. An annual budget for the project: the government must study the stages of e-government and allocate an annual budget for the project that fit all the stages and the needs.
5. A committee of consultants to supervise the project: to hire consultants in IT, Business and law to follow up and provide advisory.
6. Enhance the Government integration components with the aim of constructing a complete integration platform capable of integrating modern applications.
7. Provide training to the government employees. Concerned authorities have already provided training to the government staff, however more training sessions is required to cover all the employees and a specialized IT Training for IT staff.
8. Support creativity and Innovative ideas.
9. Improve, develop and deliver the applications and services.

Human Resources (HR)

1. Appointment of new senior managers that understand how critical and important to achieve the e-Government Service Quality.

2. Assign the objective as one of their Key Performance Indicators (KPI)

Government e-Services

1. Push forward with the implementation of the "Google Apps" to solve cost saving, communication or integration problems to achieve e-Government Service Quality.
2. Work with the government entities to achieve and implement the e-Transformation.
3. To hire committees on a Government wide level.
4. Supporting Government entities in identifying e-Services.
5. IT Business Continuity requirements are identified and completed (Business Plan).

Enabling Society and Individuals

1. Continue developing basic IT programs to the society.
2. Provide specialized training for experts and focus on the new government IT recruits.
3. Continue working with the telecommunication companies to expand broadband internet access in the Sultanate.
4. The government agencies must implement policies to provide internet services and e-mail to the employees. Having this services provided to the employees will help in reducing papers use and telephone calls which will save and protect the organization from threats related to information security.

Enabling ICT Industry Development

1. Provide a policy for creativity and support Innovation for innovators to explore new ideas.
2. Create an entrepreneurial culture to create a business that will continue to grow by adapting to change and by actively pursuing new opportunities in the market.
3. Support growing industry needs.

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REFERENCES

Slide Share (2014) Trends from the UN 2014 e-Government Survey [online] available from < http://www.slideshare.net/SarahBuelens/kerby-31618205> [19th December 2014]

Science Alert (2014) Government to E-government to E-society [online] available from < http://scialert.net/fulltext/?doi=jas.2010.2205.2210&org=11> [9th December 2014]

European Journal of ePractice (2012) Digital Strategies for Government and Business [online] available from < http://www.epractice.eu/files/Journal_Volume%2017.pdf> [10th December 2014]

Researchomatic (2014) Role of E-Government [online] available from < http://www.researchomatic.com/Role-Of-EGovernment-152080.html> [11th December 2014]

Backus, M. (2001) E-Governance and Developing Countries, Introduction and examples, Research Report, No. 3, April 2001

Taylor & Francis (2014) The Impact of the Predisposition of Citizens Toward Government on Evaluations of Its Performance [online] available from <

http://www.tandfonline.com/doi/abs/10.1080/15309576.2006.11051881?journalCode=mpmr20#.VI_W4CuUdEA> [12th December 2014]

Backus, M. (2001) E-Governance and Developing Countries, Introduction and examples, Research Report, No. 3, April 2001

Castells, M. (2009). The Rise of the Network Society: The Information Age -Economy, Society, and Culture, volume I, second edition, Chichester: John Wiley & Sons.

Dwivedi, Y., and Weerakkody, V. "Examining the factors affecting the adoption of broadband in the Kingdom of Saudi Arabia," Electronic Government, An International Journal, (4:1), 2007, pp. 43-58.

Hirschfeld, B. (2012). Global Thesis Update: Technology and the Arab Spring[online] available from http://worldperspectivesprogram.wordpress.com/2012/04/12/global-thesis-update-technology-and-the-arab-spring/[14th December 2014]

McClure, D. L. (2001). Electronic Government: Challenges must be addressed with effective leader and management [online] available from <http://www.gao.gov/new.items/d01959t.pdf>[15th December 2014]

UNPA and ASPA (2001) Benchmarking e-Government: A Golbal Perspective [online] available from < http: //unpan1.un.org/intradoc/groups/public/documents/un/unpan003984.pdf > [16th December 2014]

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