

Skills and Factors of e-Government: Case Study of Sultanate of Oman

Muatasim Al Salmi, Shahimi Mohtar, and Norlena Hasnan

Abstract—Every government is seeking to provide the best services to its country to achieve efficiency and accepted performance. This goal could be achieved by improving the service performance of the entire sectors in society. Revealing key elements of e-government factors and skills that would affect the success of e-Government is the study priority goal. Hence, the purpose of this research is to investigate and explore the factors that drive the e-government implementation and adoption that would affect the government performance as well as the success in Sultanate of Oman. Thus, the study outcomes should be the guidance to conduct e-government projects in Sultanate of Oman to reduce and eliminate as much as possible the failure possibilities. The study should also provide roadmaps and guidelines for future researchers and policy makers on the project in general and focused in citizen's determinants for e-government services that would enhance the Citizen-government relationship.

Index Terms—G2C, G2G, G2B, G2E, ICT.

I. INTRODUCTION

Ref. [1] Argued that it is essential for every e-Government project to put five main skills in order to achieve a successful e-Government [2]. Although these skills are hard to separate but their abilities are worth understanding: analytical skills, information management skills, technical skills. In the paper, the hypothesis is that “*There is a significant relationship between e-Government system and Government Operation Excellence*” and the paper is seeking to check it with quantitative approach

A. Analytical Skills

In every stage of e-Government, Analysis and interpretation skills are necessary. Hence, the project usually start with problem definition, description of current symptoms and uncovers the processes, policies and practices that are different important contributing factors. Process analysis along with different aspects like: system audits, customer satisfaction, stakeholder analysis, surveys, statistical trending, performance reviews and similar activities are required. In later stages of project, analysis of user requirements and needs, work flow, business process alternatives, and information flow become essential. Research into what other nations and organizations are doing for solving similar problems is also critical. These analyses help to improve design and build the system's

solution. Thus, the analytical skills of system users' increase its importance [1]

B. Information Management Skills

Skills in information management that would enhance and improve the operation excellence of a service provider agency or firm include treating information as a valuable organizational resource. Skilled staff and employees know that the different aspects and categories like: information content, quality, format, storage, transmission, accessibility, usability, security and preservation contribute to its value. With so many additional factors to consider, information management skills show up in many job types as per [1].

- Program managers and subordinate staff are likely to have the essential skills attached with knowledge that ensure valid content, clear data definitions, solid meta data and data quality.
- Information Technology (IT) professionals have to be counted on especially while creating formats, files and databases that are used for representing and organizing information. Those professionals could also handle the interfaces and security different features that are essential to assure both usability and integrity of the system.
- Archivists and librarians are also have their role in the system as important and valuable analytical skilled information managers, especially when it comes to observations of classification, searching and preservation.
- Researchers have a hand in this skill matter because they are often work with program specialists to construct variable data definitions, design data collection processes and evaluate institute quality control measures. These activities have the power to make sure that data are suitable for the analyses they have in mind and designed for.

C. Technical Skills

Depending on the type of e-government challenge every firm or agency is facing and seeking for there should be higher order technical skills that will probably be required for implementing the chosen desired solution. These skills are varied between different level of employees and managers with different posts and ranks. These skills are prerequisites to the system in different ways and stages like: understanding, evaluating, servicing and using e-Government system [2].

D. Communication and Presentation Skills

There is a need throughout a project to communicate its plans, steps goals, progress, issues and results. Presentations about a project and its attached parameters are considered as

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an ongoing requirement. Meeting between different parties or stakeholders might be required with legislative or executive leaders in different stages of the project in order to obtain initial and continuing funding and support. Meetings with stakeholders can assist to explain how they will be affected and encourage their buy-in and participation. Newsletters, e-mail lists, and formal reports or even social media are all ways to communicate about a project. Presentation skills extend to more than preparing and delivering a normal talk, with or without visuals. They could also comprise the ability and feasibility to take complex data and distil it into valuable information that is useful for a particular audience. Information needs to be categorized, summarized, and turned into briefings that convey and deliver the important facts without oversimplifying or drawing conclusions that were beyond the underlying supporting data about the project or the system [2].

E. Project Management Skills

Project management skills include many parts and categories like having the ability to plan, organize, estimate and allocate resources, negotiate, track progress, measure results, troubleshoot and most importantly to communicate with different parties and stakeholders of the project. Project management includes handling the different project aspects like: scope, time, cost, quality and risk. No matter the size of the project, these skills are essential and required to guide the work to a successful outcome of an e-Government [1].

II. FACTORS AFFECTING THE SUCCESS OF E-GOVERNMENT

For successful e-government endeavor there are two critical requirements are needed and required: availability and accessibility. e-government transactions have to be available to all service users 24/7. This provides citizens, partners, and employees with the flexibility in processing transactions outside standard government normal and regular office hours. With the inclusion of websites for e-governments, an e-government website needs to satisfy this desired "high availability" requirement (The Office of Government Commerce, 2004). Also, the e-government endeavor is critically dependent on the other requirement which is the accessibility of its integral websites. If the website is not accessible enough to the intended target users it will not be successful [3]. The different factors affecting success or failure have been widely discussed by several researches, below is a review of some reaches and their findings:

Danish Dada, "The Failure of e-government in Developing Countries" [4]. This research was established mainly as a revision of published previous literature related to reasons of failure in e-government projects, and then the researcher discussed that literature with the models presented by these literature (e.g. [5]-[7]) in order to explain reasons of failure in e-government model and its effect can be directly applied to the situation of e-government projects in different developing countries when stated that "The problem that often arises with developing countries is that there is frequently a mismatch between the current and

future systems, due to the large gap in the physical, cultural, economic, and various other contexts between the software designers and the place it is being implemented". However, the researcher never provided any evidence to prove this claim. This study summarized perfectly the different causes of e-government program failure in developing countries, as identified and illustrated by other authors, those causes are:

- Lack of suitable training schemes and qualified staff. This cause would make it hard and difficult to go with such a new trend of service system like e-government.
- Lack of solid and powerful change management efforts by both service provider and service users. This cause works as a huge obstacle towards the completion of the project and towards its success due to the management and citizens change refuse.
- Lack of educating and informing local citizens and public people about the value and benefits of e-government system compared with the traditional service system. In this cause the government itself should play the main role for overcoming this issue.
- High turnover rates and resignations of government IT staff due to different aspects like: uncompetitive payment and employment conditions as compared to available better payments and work environment in private sector.
- Lack of public sector required up to date skills, and as a result e-government system projects are often outsourced to the private sector for filling the available gaps in it.
- Large design-reality gaps as a result of using an off-the-shelf solution from modern and advanced industrialized country for a developing country.
- The huge need of appropriate infrastructure. Hence, the weak infrastructure such as old technology being used, unskilled people and poor communication systems are considered the first obstacle in employing the e-government program.
- The large gap between the skilled leaders and managers who can afford technology, and the unskillful poor who can't afford the same.

Marc Holzer, Seang-Tae Kim, "Digital Governance in Municipalities Worldwide" [8]. The two researchers presented a matchless model for assessing e-government services. They used a quantitative survey in order to examine the quality of 100 local e-governments services based on a model presented by [9] and developed a framework for categorizing e-government different models based on 92 different components that are perceived as critical measures of e-movement success in achieving its desired goals from the public citizen's point of view. This study came out with a result that there is an available gap between developed and under-developed countries, and thus the researchers recommended finding and obtaining a comprehensive policy and procedure for overcoming that gap. That comprehensive policy should include first of all a capacity building available for municipalities, including modern technology and information infrastructure, content, and applications and access for individuals (citizens or employees). The most important part of the study was the categorization of study variables to be measured as

important indicators of e-government success which were:

- Information Dissemination of the system, means and methods.
- Two-way communication between all parties and stakeholders, the nature of the relationship.
- Provided services that will be available to the citizen or any stakeholder.
- Integration between all the steps and subsystems of the project.
- Political participation and involvement. To what extent the citizens will be involved in this political matters, and how it would affect the complete system and relationship.
- Security of the system from internal and external, how secure transactions will be.
- Usability of the system in anytime and anywhere, how usable (easy to use) will the transactions will be, and if they are user-friendly or not.

Richard Heeks, "Benchmarking e-government: Improving the National and International Measurement, Evaluation and Comparison of e-government" [10] defended e-government for benchmark as: "e-government benchmarking means undertaking a review of comparative performance of e-government between nations or agencies". The researcher in this research relied and depends on good practice or in other words innovative practice in order to provide a comprehensive suitable framework for benchmarking e-government, backed up by statistical findings and other conceptual frameworks.

The researcher in this research was not similar to the other previous mentions researchers, who concentrated on citizens as receivers of e-government services under

Government to Citizens category in e-Government (G2C) in their benchmarking model for e-government efficiency measurements, the researchers took into consideration the other categories of e-Government like:

- (G2B) Government to Business. This is the relationship between the government and the other different private sector in the country
- (G2G) Government to Government – the interrelationship between different governmental departments and agents in the government sector as internal relationship and the relationship between different governmental agents and sectors between each other's as external relationship.

This suggested important value-chain could also summarize the inputs and outputs of the e-government system program, as inputs will be all the skilled employed people, up to date technology and communication means in terms of infrastructure of the country and the modern technology to be employed, without forgetting the important role of the governmental support financially or providing all the requirements as well as the strong management and leadership. As a result, the desired and wanted outputs will be achieved including all the e-services and information needed and required, as well as making all the transactions easier, faster and immediate. The researcher also gave different levels of possible e-government, and included them in his model of benchmarking e-government, it was unlike the others of researchers who put their attention and focus only on the national e-government. The obtained and suggested model is illustrated as furnished in Fig. 1:

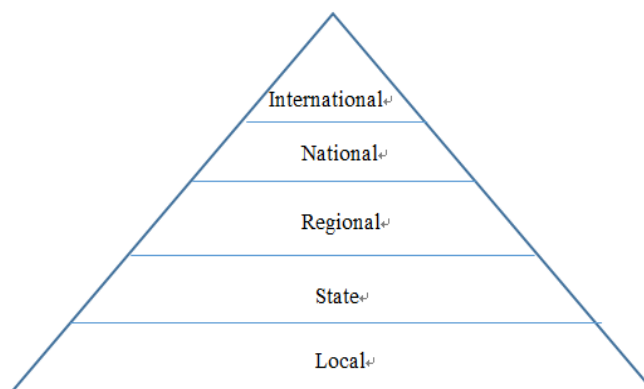


Fig. 1. E-government model [10].

Fig. 1 highlighted some important and essential points that can play a great and important role especially when taken into consideration when applying any e-government project in the future for developing countries and developed countries, where each stage of the model represent a step to be implemented and focused on before proceeding and moving to the next step in order to insure the success of an e-government system project. The researcher utilized some of the mentioned above points in order to build the research questionnaire as a benchmarks of the e-government project's success in Jordan as it is considered one of the developing countries in Middle East Area. Even though, the researcher's point of view is that those different levels and steps will not be recommended in Jordan in general, as it is

a considerable small country, and the population could hardly reach 6 million. As a result, local and national levels will be considered as ideal, inter-national level might be implemented, but it will take a long time in order to overcome the different obstacles and prevent the faced change management aspects from management and citizens.

III. RESEARCH METHODOLOGY

An on-line survey has been conducted through sending SMS message to a random sample of local citizens aged from 18 to 60 years. The target population for this study is citizens in Sultanate of Oman. The unit of this study consists of citizens in business sectors, employees in

government sectors, citizens without work. In Sultanate of Oman there are sums of 42 governments and governmental agencies, a population of 3,992 million citizens upon to the last conducted national count in 2014 where 56.6% are Local citizens and 43.3% expats [11]. [12] took 10% as rule of thumb while choosing a sample of big [13]. The main telecommunication services providers in Oman are Omantel and Ooredoo. Therefore, the agreement with the telecommunication services agency which is authorized to broadcast SMSs to local registered Sim-cards. In this agency there are three main filters described as following:

- **Demographic Filter:** this filter considers many filters below it like age and gender. For the purpose of this study, it was agreed with the agency to activate this filter partially in order to include only the age filter as it was described earlier that the research will include only local citizens aged from 18 to 60 years old.
- **Geographic Filter:** this filter considers the location of the participators within the Sultanate of Oman and specifically within which region (wilayah). This filter was included in order to consider only regions that are participating more in in the pilot test done earlier. The agreement was to include Muscat, Al Dakhliya, Al Sharqiya and Al Batinah.
- **Registration Filter:** in this filter there is a differentiation and a classification of the registered company of the Sim-card. As it is indicated earlier,

there are two telecommunication services providers in Sultanate of Oman which are Omantel and Ooredoo. Hence this filter is to give the survey more options if it is required to get only from one service provider or if it is required to distribute specific SMSs to each service provider. This filter was not requested and not required for this survey because it is not part of the criteria in research methodology and this filter will not contribute to the survey

Thus, it was agreed with the telecommunication agency to send 10,000 random SMSs upon to the attached demographic and geographic filters only and the target is to get a minimum of 500 answers for the questionnaire. However, due to the length of the message that is requested to send to the participants, each message should count as two messages with the agency (upon to the number of letters sophisticated for each SMS). Thus, the total number of SMSs sent to the participants became 5000 SMSs. This method of data collection is called Push SMS application system where [14]) stated that a Push SMS application system is basically whereby a message is been sent from any prospective like application, person, company or governmental agency to the users, customers or citizens.

IV. FINDINGS AND DISCUSSION

TABLE I: DEMOGRAPHIC DISTRIBUTIONS OF THE RESPONDENTS

Variable	Demographic Features	Frequency	Percent %
Gender	Male	435	74.36
	Female	150	25.64
Age	18-30	251	42.95
	31-40	257	43.93
	41-50	64	10.90
	51-60	13	2.22
Region	Muscat	289	52.36
	Batinah	99	17.93
	Sharqiya	84	15.22
	Dakhliya	80	14.49
Working Place	private personal business	96	16.42
	Private sector	208	35.63
	Public sector	281	47.95

As per the quantitative approach of survey, from 5000 distributed questionnaires, 1257 questionnaires were returned. Thus, the study’s response rate is 25.14%. However, after checking the obtained responses Out of these returned questionnaires, only 585 questionnaires were usable and applicable for analysis because the rest didn’t answer all questions and they skipped some of them. So, the usable response rate is 12%. As stated earlier, the survey is not covering all citizens in Sultanate of Oman but it will cover only citizens in the ages between 18 to 60 years old. The reason behind this is that citizens are considered valid ages who are more prone to utilize the e-government services. The respondent’s demographical data are

presented in Table I and Table II shows the question list along with their statistic data.

A. Reliability Test

In order to check the selected scales status in terms of relatively reliable in this research, calculating the variable factor Cronbach's Alpha is essential in order to obtain the individual internal consistency. The instrument reliability implies that the checking measure will produce the same results if used repetitively. Table III below is showing that Cronbach's Alpha is illustrating reliable data and it is greater than 0.5.

TABLE II: FACTORS OF E-GOVERNMENT

Factors of E-Government		Mean	
		Statistic	Std. Error
ICC: Citizen-Centricity	Q-1 visits to governmental offices reduced - have no problem with the languages been used - easy to get help in the system in communication examples call, live chat, email etc.	2.5641	0.03779
	Q-2 have no problem with the languages been used	2.1009	0.03452
	Q-3- easy to get help in the system in communication examples call, live chat, email etc.	2.6496	0.03642
IFC: Facilitation Conditions	Q-4 Government is giving high support in promoting and put e-government approach as priority	2.4769	0.03771
	Q-5 Required resources and equipment in order to use e-government system like internet, computer, electricity etc.	1.6974	0.03271
	Q-6 Internet cost is reasonable and affordable	3.1487	0.03725
IEE: Effort Expectancy	Q-7 Internet in my city is reliable for e-government services use	2.9162	0.03783
	Q-8 By using current e-Government system, my governmental tasks became easier	2.4906	0.03507
	Q-9 By using current e-Government system, governmental tasks take less time than the manual old system.	2.4991	0.03482
	Q-10 - By using current e-Government system, no complication or difficulty is associated with its use	2.7231	0.03242
IPE: Performance Expectancy	Q-11 By using current e-Government system, Learning to operate along with dealing with it is easy for me	2.3573	0.03202
	Q-12 By using current e-Government system, my productivity increased	2.6051	0.03325
	Q-13 By using current e-Government system, traditional manual errors and mistakes are reduced.	2.4735	0.03361
	Q-14 Overall, I am satisfied with the way the system is currently	2.7692	0.03708

TABLE III: RELIABILITY TEST

VAR		Cronbach's Alpha	Composite Reliability	N of Items
IEGOV	ICC	0.738	0.8716	3
	IFC	0.609	0.7881	4
	IEE	0.902	0.9419	4
	IPE	0.839	0.9182	3

Although the survey was distributed randomly in all four regions of Sultanate of Oman but most of the respondents were from the capital (Muscat) which score alone about 50%. Indeed, this show their vision and interest in knowledge and the new system of e-government approach. The majority of respondents were males (75%) while female has less percentage 25%. This is considered normal and rational in Oman because Oman is more as traditional country where female does not like to involve herself in unknown areas nor replying to unknown person's message. The results also show that most of the respondents were in the two ranges combined to be from 18 to 40 years old, which reflects the knowledge, interest and reaction towards the new system by the younger generation compared to the elders. As per the working place, it was almost normally distributed between government sector and private sector while the number of participants with private business or

not working became much less. The reason behind that most of the Omani's prefer to have regular work duty and to have their private business aside of it. Hence, the results are rational and expected.

As presented earlier, the objective of this paper is to investigate the factors that contribute to the success implementation of the e-government and specifically its contribution towards the Government Operation Excellence (GOE), the hypothesis is that "There is a significant relationship between e-Government system and Government Operation Excellence"

SmartPLS output showing that this hypothesis is valid and accepted. The result indicates that the path coefficient from EGOV to GOE was statistically significant with a very strong standardized estimate and high t-value of more than 2.58. The out values are illustrated in Table II and t-value for the hypothesis testing is in Fig. 2.

TABLE IV: HYPOTHESIS OUTPUT

EGOV -> GOE	β	Mean	SD	SE	T-Value
	0.8342	0.8344	0.014	0.014	59.6463

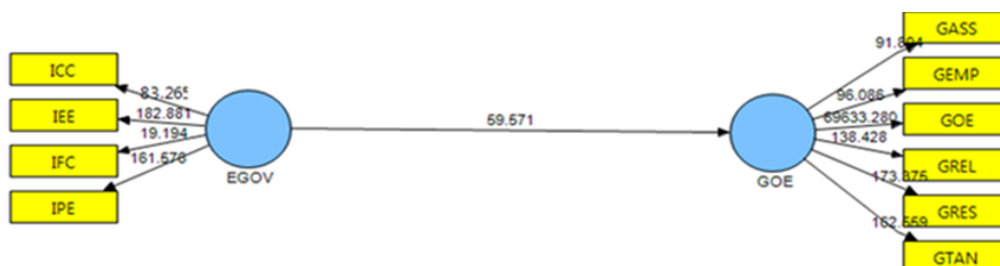


Fig. 2. Hypothesis output.

V. CONCLUSION

The main purpose of this study was to investigate the skills and factors that influence e-government services and system that would affect the government operation excellence. The first step in the study was by conducting an extensive literature review for deriving the adoption relevant skills and factors. The research aimed to understand these skills and factors and plug it to the current e-Government services practices, concept, categories and stages in Sultanate of Oman. Since the study is conducted for the empirical work in Sultanate of Oman, it was considered essential and important to gain and obtain enough knowledge about the context of the field study especially in the country for distinct cultural characteristics. The e-government success is contingent upon citizen willingness and intention to use e-government services. Government of the country should give important consideration to develop IT projects without forgetting to focus on citizen's viewpoints in order to transfer traditional services to online form successfully. An understanding of the citizen acceptance relevant factors in e-government can provide policy and decision makers with a set of strategic management plans in order to build and prompt greater acceptance towards these services. The research's results hold important and essential strategic suggestions for various government departments and agencies that provide e-government services in increasing the citizens' adoption rate.

In terms of e-Government, the results score the importance of different skills and factors in government for adoption. Government should give more effort on building positive government-citizen relationships as they are considered the main customers and accordingly the main factor that will affect the success or failure of the e-Government project. Hence, it is considered important and essential to have the necessary skills and expertise while conducting the project for smooth achievement of the goal. Furthermore, co-operating with competent well-known businesses in e-services and e-government area in order to enhance, improve and make the project more successful. Government should facilitate better environment and platform for the project in order to enhance the project as well as achieving GOE significantly and successfully. For instance, the Internet is insignificant for developers to implement the latest advance tools, equipment and foundations with significant security standards. Government could focus to promote and educate citizens about the provided e-services by e-government technology that would provide the confidence and overcome the available barriers between individuals and the technology. Clear visions, missions and strategies for developing e-Government in the country could help in facilitating the e-Government adoption. Such initiatives could encourage citizens' intention to use e-Government as a national successful project.

VI. RESEARCH LIMITATIONS

This research has developed a framework from well-

known and accepted scholarly theories in adoption and has then validated these by covering a large size sample of 500 participants pooled from the citizens of Sultanate of Oman. However, like any other research, this research has some limitations.

The first limitation comes from the sample population collection. Although the research has followed the common sampling in data collection practice the data was only collected from Muscat, Al Batinah, al Dakhliya and Al Sharqiya. This procedure is good especially with very high sample size but in order to generalize the result to the whole country but it would be more efficient if it had been collected from all regions of the Sultanate.

Another important limitation is reflected in the high number of male compared to female participants. Although, data distribution procedure did not have a demographic filter for gender, it was noticed that the number of participants from male is very large compared to the female participants

Another limitation is the data distribution procedure. Although the research is talking about IT and technology aspects and used one of the most famous procedures in data distribution, which is online procedure through links in phones, this procedure has a limitation. Participants need to obtain smart phones, smart devices or at least personal computers or laptops in order to participate in the data collection. Citizens who do not have knowledge of computers and modern smart devices or who do not have the required tools and equipment for participating in the collection are not included.

Finally, although the study follows the common languages in the country (Arabic and English) it is important to note that there could be a possibility of a slight skew of the original required and aimed meaning during the translation process.

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