

Citizen Intention to Adopt e-Government Services in Saudi Arabia

Sulaiman A. Alateyah¹, Victor Chang², Richard M. Crowder¹ and Gary B. Wills¹

¹Electronics and Computer Science, University of Southampton, Southampton, U.K.

²Leeds Metropolitan University, Leeds, U.K.

Abstract. Although e-Government has been adopted in developed countries, it has not been widely adopted in developing countries particularly in the Arab world. This explains our motivation in identifying factors that can improve the adoption of e-Government in Saudi Arabia. While there are challenges ahead for e-Government adoption, we have identified ten factors that can influence successful delivery. These factors were defined and categorized and followed by an exploratory study to examine the importance of these factors. In order to validate our hypothesis, we used questionnaires to collect the views of three groups of Saudi citizens, and use the triangulation method to validate our results. Our statistical results show that we have very low t-test value in our one sample t-test which supports our hypothesis by identifying ten important factors for Saudi citizen adoption of e-Government services. We conclude that these ten factors can determine the successful adoption of e-Government in Saudi Arabia and meet the strategic plan set by the Saudi government in accessing what is required to increase adoption.

1 Introduction

The e-Government initiatives are recommended by the United Nations, which has a conceptual framework for E-government programmes United Nations [1]. Under their guidelines, the use of information and communication technologies (ICT) is at their centre of strategies to enable government services to be successfully delivered to the citizens of the participating UN states. The e-Government initiatives have been widely adopted, whereby the use of ICT can improve the digital connectivity and interactions between different citizens and organisations [2]. In these cases, the advancement in technology can enhance the efficiencies and collaboration between departments in the governments and ensure that services can be delivered to meet the requirements of all the stakeholders and citizens involved. This also ensures that the administrative processes and services of government can be offered by the electronic systems. Blending administrative processes and government services, the increment of the capacity and readiness of the public sector are essential in the areas of a country's technological and telecommunications infrastructure and the level of its human resources development [3].

2 Literature Review

2.1 Citizen Adoption

Yonazi et al., [4] state that developing countries can benefit from it enormously from the introduction of e-government. Based on the literature in [5], an existing challenge is how to enhance the e-government adoption and the use of their online government services. However, literature in [4] and [5] do not address e-Government adoption and the factors for successful adoption in developing countries, particularly in the Arab world [6, 7]. We undertook a comprehensive literature review as follows.

Firstly, Dong, et al. [8] explain why e-Government adoption is often not supported by the e-Government researchers, because citizens do not use online services [5]. Secondly, Carter and Belanger [9] assert that no study has identified the core factors that influence citizen adoption of e-Government initiatives, even though there are attempts to analyse user adoption of electronic commerce [10]. Thirdly, studies undertaken by Colesca [11] suggest that many studies regarding the citizen adoption of e-Government services focus on trust [12], security [13] and transparency [14] that influence e-Government adoption. Finally, research by Margetts [15], cited by Yonazi, et al. [4], indicate that improving the opportunity that e-Government might deliver benefits including social and economic to their public is based on high adoption of these initiatives.

2.2 Models Used to Measure Adoption of New Technologies

To make a fair justification for e-Government adoption, common models that used by researchers' and different contributions have been reviewed, including the Technology Adoption Model (TAM) by Davis [16], Diffusion of Innovations Model (DOI) by Rogers [17] and Unified Theory of Acceptance and Use of Technology (UTAUT) by [18]. Other researchers have developed their models based on the extended development of Davis [16] to propose factors that would encourage citizen to adopt e-Government. These models have a combination of factors which have been adopted from TAM, DOI and UTAUT include Trustworthiness by [19], model for citizen adoption by [20] and Rehman and Esichaikul [21] model of citizen adoption.

3 Discussion

Obtaining the views of prospective e-government users and experts in the field are important for the development of this research. Topics for considerations are as follows. Firstly, identify the challenges that would face the implementation and development of e-Government in Saudi Arabia. Secondly, the possible factors that would affect the citizens' intention to adopt E-government services. While addressing these two topics, key questions need to be asked and they are: (i) What are the challenges or barriers to implement and develop e-Government in Saudi Arabia?; (ii) What are the influential factors to be integrated in a model for implementing and

developing E-government in order to be adopted by the citizen? Supporting descriptions are described as follows.

3.1 Factors Influencing Citizens' Intention to Adopt e-Government Services in Saudi Arabia

There are related issues to be taken into consideration while addressing issues in this research question. The most important question is: "How can the Saudi government overcome challenges to help its citizens adopt e-Government?". In order to facilitate this, important factors are identified along with the development of answering questions in the survey. This key question to help people adopt e-Government services. All factors are presented in Table I which was based on literature reviews in 10 categories. Our next goal was to validate our hypothesis with these ten factors, so that we can demonstrate that our approach can meet the needs of Saudi citizens.

3.2 Methods to Validate This Research

Triangulation method is used to increase precision in empirical research [22] which is fully supportive to our proposal. Due to this reason, our validation technique is based on the Triangulation method. Another valid point to note regarding this approach is that according to Runeson and Höst [22], the triangulation method can offer a more comprehensive answer to address our research question. In this research, the proposed factors are validated using the triangulation method based on three key aspects which are, a detailed literature review has to be undertaken, as well as questionnaires based on these ten proposed factors need to be distributed among Saudis' citizens. Additionally, Saudi government's employees and experts will be asked to participate in the study.

4 The Exploratory Study and Its Results

4.1 Questionnaire for Saudi Citizens

Closed-ended questions were provided by us to facilitate the design of the Saudi citizens' questionnaire. The supporting reason is that closed-ended questions can find out how important the defined factors are and also how factors can influence Saudi citizens to use the e-Government services. Fourteen closed-ended questions were designed to focus on the identified factors under five categories including culture, security, privacy, trust and website design. The set of the questions are included in the appendix. The culture factor has been presented by two questions, one is about the direct effect on the citizen intention and the other is an indirect effecting on the citizens' trust. In addition, transaction security also has been presented by two questions.

4.2 About the Surveys and Results

This section describes the groups involved, the process by which the survey was undertaken and how the results associated with our study. Firstly, questionnaires with fourteen closed-ended questions were designed and distributed online to Saudi general public. Secondly, questionnaires with twenty three closed-ended questions were handed in person to the government employees. Thirdly, questionnaires with twenty nine closed-ended questions were designed for the experts' interview. Each expert was interviewed in person. The citizens' responses have been gathered using online surveys. Using the collated data, data analysis was undertaken by using SPSS and running a one-sample t-test against a set value of 3.5 and the citizens' questionnaires results are presented in Table II. Since the questionnaires have different questions and applies to different group, each set of data has been analysed separately. In this paper, only the results of the questionnaires apply to citizens are shown in table II. The data analysis and its results for the Saudi government's employees and experts are presented in previous work [23, 24].

Table 1. Factors influencing citizens to adopt e-Government services.

No	Factors	Applied to
1	Technical Infrastructure	Government employees and experts
2	Computer and Information Literacy <ul style="list-style-type: none"> • Age. • Gender. • Education. 	
3	Lack of Awareness	
4	Security <ul style="list-style-type: none"> • Transaction Security. • Information Security. • Perceived Risk. 	Citizen
5	Privacy	
6	Trust <ul style="list-style-type: none"> • Trust in Government. • Trust In Internet. 	
7	Quality of Service <ul style="list-style-type: none"> • Service Quality. • Reliability. • Availability. • Speed of Delivery. • Information Quality. 	Government employees and experts
8	Culture	Citizen
9	Diffusion Of Innovation <ul style="list-style-type: none"> • Compatibility. • Complexity. • Image. • Relative Advantage. 	Government employees and experts
10	Website Design <ul style="list-style-type: none"> • Perceived Usefulness. • Perceived Ease of Use. • Multi-lingual Website • Usability. • Accessibility. 	Citizen
		Government employees and experts

Table 2. The result of the one sample t-test of the questionnaires apply to Saudi citizens.

Factors	p-value	Result
Security	.005	statistically significant
Transaction Security	<.001	statistically significant
	.010	statistically significant
Information Security	<.001	statistically significant
Risk	<.001	statistically significant
Privacy	.034	statistically significant
Trust	<.001	statistically significant
Trust in Internet	<.001	statistically significant
Trust in Government	<.001	statistically significant
Culture	<.001	statistically significant
Indirect effect of Culture's on trust	0.222	statistically significant
Usefulness	<.001	statistically significant
Ease of Use	<.001	statistically significant

4.3 The Reliability of the Results

We use a reliable approach to minimize errors in measurement. In order to achieve that, we select a high confidence interval in our data analysis [25]. Reliability in this context, refers to the extent to which data analysis procedures will produce consistent results [26]. While investigating this further, the reliability value was argued by researchers. One research group [25] stated that the reliability value of 0.7 to 0.8 is an acceptable value for Cronbach's alpha (α). However, Liu and Arnett [27] explained that as a "rule of thumb" 0.6 could be accepted. Other approaches such as the use of a framework to improve the quality and reliability can also be used [28].

After the analysis of survey results, an assessment of the reliability was required and Cronbach's alpha was used to undertake the test. The result confirms that Cronbach's alpha had an acceptable outcome, with α being equal to 0.618. This means that the reliability coefficient for the questionnaire's result could be seen as adequate.

5 Conclusion

This paper presents an e-Government approach that addresses the needs of Saudi

Arabian citizens. We explain the importance of our Saudi e-Government initiative to meet the requirements of the Saudi government and the general public. We have undertaken studies to demonstrate that there are ten factors that can improve the e-Government adoption in Saudi Arabia. These factors have been defined and categorized followed by an exploratory study to examine the importance of these factors. In order to validate our hypothesis, we set questionnaires for three groups of Saudi citizens: general public; government employees and experts. We use the triangulation method to validate our results. Our statistical results show that we have very low t-test value in our one sample t-test which supports our hypothesis by identifying ten important factors for Saudi citizen adoption of e-Government services. We conclude that these ten factors can determine the e-Government adoption in Saudi Arabia and meet strategic plan set by the Saudi government in accessing what is required to increase the popularity in adoption. Results from our proposed approach can offer benefits to Saudi citizens. There are other challenges such as privacy, security, trust, culture, computer and information literacy, and IT infrastructure to be resolved.

Acknowledgement

The authors acknowledge the award of a King Abdullah scholarship to Sulaiman Alateyah to allow this research to be undertaken.

References

1. United Nations The united nations e-government development database. Available at: <http://www2.unpan.org/egovkb/about/index.htm>, Access date (05/07), 2010.
2. Al-Sobhi, F., Weerakkody, V., and Kamal, M. M., "An exploratory study on the role of intermediaries in delivering public services in madinah city: Case of saudi arabia," *Transforming Government: People, Process and Policy*, vol. 4, 2010, pp. 14-36.
3. United Nations "United nations e-government survey : Leveraging e-government at a time of financial and economic crisis," New York 2010 2010.
4. Yonazi, J., Sol, H., and Boonstra, A., "Exploring issues underlying citizen adoption of e-government initiatives in developing countries: The case of tanzania.," *Electronic Journal of e-Government*, vol. 8, Dec 2010, pp. 176-188.
5. Warkentin, M., Gefen, D., Pavlou, P. A., and Rose, G. M., "Encouraging citizen adoption of e-government by building trust," *Electronic Markets*, vol. 12, 2002, pp. 157-162.
6. AlShihi, H., "E-government development and adoption dilemma: Oman case study," in *The 6th International We-B (Working for eBusiness) Conference*, Victoria University, Melbourne, Australia 2005.
7. AlAwadhi, S. and Morris, A., "The use of the utaut model in the adoption of e-government services in kuwait," presented at the *Proceedings of the Proceedings of the 41st Annual Hawaii International Conference on System Sciences*, 2008.
8. Dong, X., Xiong, L., and Wang, W., "How adoption is g2c model e-government? — evidence from xi' an and nan jing," in *E -Business and E -Government (ICEE)*, 2011 International Conference on, 2011, pp. 1-4.
9. Carter, L. and Belanger, F., "Citizen adoption of electronic government initiatives," in

- System Sciences 2004. , Proceedings of the 37th Annual Hawaii International Conference, 2004, p. 10
10. Gefen, D., Karahanna, E., and Straub, D. W., "Trust and tam in online shopping: An integrated model," *MIS Quarterly*, vol. 27, 2003, pp. 51-90.
 11. Colesca, S. E., "Increasing e-trust: A solution to minimize risk in e-government adoption," *JOURNAL OF APPLIED QUANTITATIVE METHODS*, vol. 4, 2009, pp. 31-44.
 12. Srivastava, S. C. and Teo, T. S. H., "Citizen trust development for e-government adoption: Case of singapore," in "Proceedings of Pacific Asia Conference on Information Systems, 2005, pp. 721-724.
 13. Colesca, S., "The main factors of on-line trust," *Economia. Seria Management*, vol. 10, 2007, pp. 27-37.
 14. Marche, S. and McNiven, J. D., "E-government and e-governance: The future isn't what it used to be," *Canadian Journal of Administrative Sciences / Revue Canadienne des Sciences de l'Administration*, vol. 20, 2003, pp. 74-86.
 15. Margetts, H., "E-government in britain—a decade on," *Parliamentary Affairs*, vol. 59, 2006, pp. 250-265.
 16. Davis, F. D., "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, vol. 13, 1989, pp. 319-340.
 17. Rogers, E. M., *Diffusion of innovations*, 4th ed. New York: Free Press, 1995.
 18. Venkatesh, V., Morris, M. G., Gordon, B. D., and Davis, F. D., "User acceptance of information technology: Toward a unified view," *MIS Quarterly*, vol. 27, 2003, pp. 425-478.
 19. Belanger, F., Hiller, J. S., and Smith, W. J., "Trustworthiness in electronic commerce: The role of privacy, security, and site attributes," *The Journal of Strategic Information Systems*, vol. 11, 2002, pp. 245-270.
 20. AlNuaimi, M., Shaalan, K., Alnuaimi, M., and Alnuaimi, K., "Barriers to electronic government citizens' adoption: A case of municipal sector in the emirate of abu dhabi," in *Developments in E-systems Engineering (DeSE)*, 2011, 2011, pp. 398-403.
 21. Rehman, M. and Esichaikul, V., "Factors influencing the adoption of e-government in pakistan," in *E -Business and E -Government (ICEE)*, 2011 International Conference on, 2011, pp. 1-4.
 22. Runeson, P. and Höst, M., "Guidelines for conducting and reporting case study research in software engineering," *Empirical Software Engineering*, vol. 14, 2009, pp. 131-164.
 23. Alateyah, S., Crowder, R. M., and Wills, G. B., "An exploratory study of proposed factors to adopt e-government services," *International Journal of Advanced Computer Science and Applications*, vol. 4, 2013,
 24. Alateyah, S. A., Crowder, R. M., and Wills, G. B., "Factors influencing citizen intention to adopt e-government in saudi arabia," in *Information Society (i-Society)*, 2013 International Conference on, 2013, pp. 250-255.
 25. Field, A., *Discovering statistics using spss*: Sage Publications Limited, 2009.
 26. Saunders, M. N. K., Lewis, P., and Thornhill, A., *Research methods for business students*, 5TH ed.: Pearson, 2009.
 27. Liu, C. and Arnett, K. P., "Exploring the factors associated with web site success in the context of electronic commerce," *Information & Management*, vol. 38, 2000, pp. 23-33.
 28. Chang, V., Walters, R. J., and Wills, G., "The development that leads to the cloud computing business framework," *International Journal of Information Management*, vol. 33, 2013, pp. 524-538.

Appendix

The List of the Questions That Applies to the Citizens' Questionnaires

1. Culture in general does influence citizens to use E-government services.
2. Culture can affect the trust of citizens who intend to use E-government services.
3. Sending information via network medium (e.g. Internet) is safe, which encourages me to use E-government services.
4. Providing critical information to E-government websites can be risky, which prevents me from using the E-services.
5. The transaction between E-government services and me is secure and influences my intention to use the online services.
6. The low level of the transaction security which might cause Losing information, encouraging me to use the paper-based system.
7. General security about my information, which I am concerned about, affects my intention to use E-government services.
8. Privacy is a critical issue that citizens are afraid of when they intend to use E-government services.
9. Trust in general is an important factor that influences citizens to adopt E-government services.
10. Trust in Internet does not affect the intention of citizens to use E-government services.
11. Trust in government has an impact on the intention of citizens to use E-government services.
12. The design of a government's website increases my intention to use the E-government Services.
13. Whenever the usefulness of a website is clear and easily perceived by me, I use the E-government services.
14. A website's perceived ease of use influences me to use the E-government services.