Research Approaches in Examining M-Government Services: An Investigation

Noor Suriana Abu Bakar

Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA,Malaysia
suriana_su@melaka.uitm.edu.my

Azizah Abdul Rahman(Assoc.Prof)

Faculty of Computing, Universiti Teknologi Malaysia, Malaysia
azizahar@utm.my

Haza Nuzly Abdul Hamid(Dr)

Faculty of Computing, Universiti Teknologi Malaysia, Malaysia
haza@utm.my

ABSTRACT

Mobile government, which is an emergent phenomenon, represents a solution for many countries to reach their citizens and to improve the services of government-to-citizens (G2C). Hence, most researchers have merely focused on the citizens' adoption and usage issues, security, implementation and transformation, and the success factors of m-government services. However, in order to proceed with the study on examining the m-government services, it is vital to first analyze the most suitable research method that can be used. Thus, this paper investigated the research approaches used for examining m-government services by reviewing 37 papers that are related to this topic, which were retrieved from four online databases: a) IEEE Xplore, b) Science Direct, c) Emerald, and d) ACM Digital Library. Only papers from 2007 to 2014 were selected for further review. The findings suggested that the survey method was mostly used to examine the m-government services.

Keywords –m-government, m-government services, research approaches.

INTRODUCTION

M-Government may be defined as the use of mobile wireless communication technology within the government administration and it is used as a tool for the delivery of services and information to the citizens and for business purposes (El-Kiki, & Lawrence, 2006). The mobile technology also has significantly expanded the capacity of the government to deliver outcomes for the benefits of the government, citizens, businesses, and to give positive impact to the overall

national economic growth (ITU, 2010).

In the study of m-government services, there are various domains to be considered, such as business, citizens, and organizations. However, before conducting any research, it is important to first select the most suitable approach and method for the research. Defining the research approach is an important task since it provides the guideline for the activities that need to be performed to achieve the objectives of the project.

In every research, it is very important to first recognize the paradigm. Research paradigm helps the researchers to identify their roles in the research process, the research design, the process of data collection, and the analyses of the findings. In the social science research, there are three paradigms: positivist, interpretive, and critical thinking. Therefore, in order to decide the paradigm of this research, the author reviewed the research methods used in the previous researches related to the study of m-government services.

Reviewing information systems research paradigm

In every research, it is very important to first recognize the paradigm. Research paradigm has been found to be vital as it aids researchers to identify their tasks in the research process, the research design, the process of data collection, and the analyses of the findings. There are a number of paradigms that have been developed in the previous social science researches. The three recognized paradigms are positivist, interpretive, and critical thinking.

A. The Positivist Research

The positivists generally assume that reality is objectively given and it may be described by measurable properties, which are independent of the researcher and his/her instruments. The positivist studies usually attempt to assess theories in order to increase the predictive comprehension of certain phenomena. According to Orlikowski and Baroudi (1991), IS research is regarded as a positivist research if there are evidences of formal propositions, quantifiable measures of variables, hypotheses testing, and inferences are drawn regarding a phenomenon from the sample to an assured population.

B. The Interpretive Research

The interpretive researchers begin with an assumption that access to reality can only be made possible by focusing on social constructions, such as language, consciousness, and shared meanings. The interpretive research does not predefine dependent and independent variables, but looks into the full complexity of human sense as a situation emerges (Kaplan, & Maxwell, 1994). According to Walsham (1993), interpretive studies generally attempt to comprehend certain phenomena through the meanings that people assign and the interpretive methods of research in IS are "aimed at producing an understanding of the context of the information system and the process, whereby the information system influences

and is influenced by the context".

C.   The Critical Research

The critical researchers believe that social reality is historically constituted and that it is produced and reproduced by people. Even though people can deliberately act to change their social and economic state of affairs, critical researchers have identified that their ability to do so is constrained by various forms of social, cultural, and political dominations. The critical research focuses on the oppositions, conflicts, obstacles, and contradictions in the contemporary society, besides seeking to be emancipatory, i.e. it should facilitate in eliminating the causes of alienation and domination.

APPROACH AND METHOD

A. Sample Selection

The author reviewed papers published from the period of 2007 until 2014. Before selecting the papers, the domain of interest for this research had been carefully specified. The domain described the disciplinary area in which the search was to be conducted. Accordingly, since the purpose of this research was to study the mobile government issues; the domain was specified for Government-to-Citizens services (G2C). However, in order to have a broader view of the approaches to the m-government services, this paper also analyzed the previous researches that were inclusive of others domains, such as m-tourism, m-education, m-agriculture, and many more related to the m-government services.

From this search, the author found related articles that discuss the studies on m-government services in all domain areas. This was done by using selected databases to extract the relevant research articles or reports through the search of titles and abstracts with a pre-determined search term. As for the search process, the following databases were used: IEEE Xplore, Science Direct, Emerald, and ACM Digital Library.

B. The Search Process

This study aimed to find articles and studies about mobile government services, which have been published from 2007 until current. Consequently, a number of studies were retrieved from IEEE Xplore, Science Direct, Emerald, and ACM Digital Library. From IEEE Xplore, a total of 77 papers were retrieved, 165 papers were obtained from Science Direct, ACM Digital Library with 20 papers, and Emerald with 50 papers, respectively. As shown in Table 1, the papers were selected with four steps: Step 1 – a search was conducted using terms and keywords, Step 2 – the papers retrieved were filtered with the inclusion and the exclusion criteria, Step 3 – the studies were filtered based on their titles and abstracts, and finally, Step 4 – the primary studies were selected after full-text screening process. Table 2 provides the information related to the digital databases used for searching the

papers. From 312 papers that had been retrieved, only 37 papers were found to be most related to the selected studies (refer to Table 3). Figure 1 also represents the search results through online databases retrieval.

Table 1: Inclusion and exclusion criteria

| Inclusion criteria	Studies that focus on mobile government services.
Studies that have been published from 2007 until 2014.	
Exclusion criteria	Studies that are not in English.
Studies that are not related to the research question.	
Publications/reports with only an abstract or Power Point Slides available.	
Duplicate studies.	

Table 2: Digital databases used for searching

Database name	Link
IEEE Xplore	http://www.ieee.org/web/publications/xplore/
Science Direct	http://www.elsevier.com
Emerald	http://www.emeraldinsight.com
ACM Digital Library	http://dl.acm.org

Table 3: Overview of search results

Online database	No. of retrieved studies	No. of selected studies
IEEE Xplore	77	12
Science Direct	165	15
ACM Digital Library	20	4
Emerald	50	6
Total of studies	312	37

Figure 1: Search results through online databases retrieval
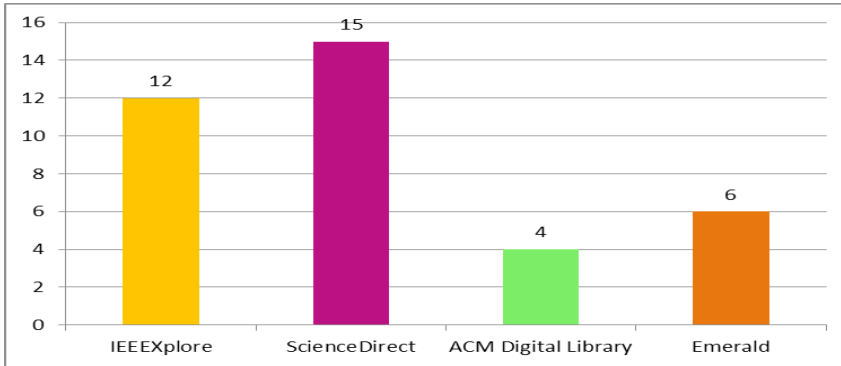
FINDINGS AND DISCUSSION

From the 37 papers examined, 20 papers (54%) addressed the issues related to adoption and usage, 3 papers (8%) focused on security, 10 papers (27%) looked into implementation and transformation, and 4 papers (11%) identified the success factors of m-government services, as shown in Figure 2. Thus, in order to decide the paradigm of this research, the author reviewed the research methods used in the previous researches related to the study of m-government services.

The findings suggested that the survey method was used predominantly when investigating the citizens' adoption and usages of the technology, which had been the highest percentage; 48.7%. In contrast, the case study method, 24.3%, was the most widely used approach when examining the implementation and transformation issues of m-government services (refer to Table 4).

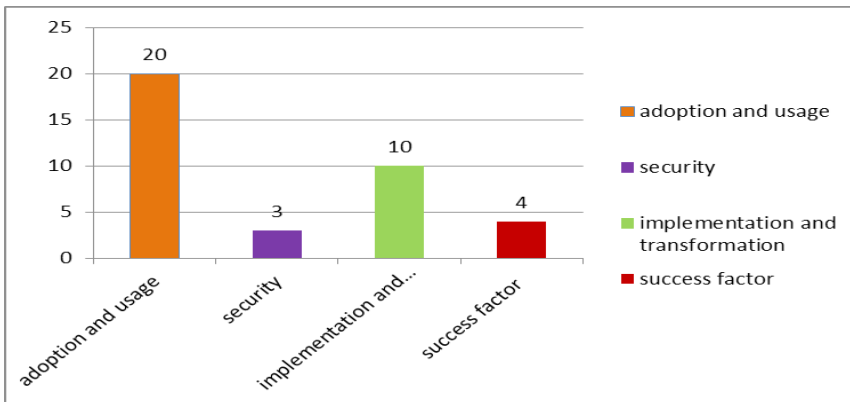**Figure 2: Selected studies domain in m-government services**

Table 4: Research methods used in the previous studies

Research Paradigm	Research Method	No of Paper	Percentage
Interpretive	Interview	4	10.9
	Grounded Theory	3	8.1
	Focus Group	3	8.1
	Case Study	9	24.3
Positivist	Survey	18	48.7

The positivist research method includes laboratory and field experiments, measurements, surveys, questionnaires, instruments, statistical analyses, and simulations. In this research, the author suggested the positivist research method as the survey was used to analyze the level of adoption and usage among citizens and to identify the success factors for better implementation of m-government services. Survey is a very popular method used in information system area. In most of the studies, questionnaires were used as the survey instrument to collect data from the respondents.

In this research, the unit of analysis focused on the individual users. All the selected papers mainly focused on analyzing the m-government services towards G2C.

CONCLUSION

This paper concludes that the survey method is the most suitable research method for examining the adoption and the success factors of m-government services. Most of the studies with the purpose of examining the m-government services used theories to explain each factor found. The researchers suggested the use of the survey method to measure the effects of each factor to the m-government constructs. This is because the survey method provides solid and measurable data to the findings.

Furthermore, the analysis also showed that most studies on m-government services focused on G2C compared to other domains. Besides, the previous researches mostly focused on adoption and usage, information and transformation, security, and success factors. Limited studies have been conducted to look into individual's potential needs, requirements, and demands. Thus, realizing this gap, a study on users' needs and requirements in m-government services is needed to solve the barriers within the m-government services found in the G2C and the personalization strategy has been identified as the one alternative solution to encourage users to use m-government services.

REFERENCES

Alhussain, T. & Drew, S. (2011). Developing a Theoretical Framework for the Adoption of Biometrics in M-Government Applications Using Grounded Theory. , (2009).

Al-Khamasey, S. & Lawrence, E. (2010). Mobile Government in Action at Local Councils: A Case Study. 2010 Fourth International Conference on Digital Society, pp.1–7.

Aloudat, A. & Michael, K. (2011). Toward the regulation of ubiquitous mobile government: a case study on location-based emergency services in Australia. Electronic Commerce Research, 11, pp.31–74.

Anon, PPM_2013_04_Sareen.

Awotwi, J.E. (2012). ICT-enabled delivery of maternal health services. Proceedings of the 6th International Conference on Theory and Practice of Electronic Governance – ICEGOV'12, p.369.

Bhuiyan, M.S.H. (2010). E-Government Applications in Bangladesh - Status and Challenges. , pp.255–260.

Carlsson, C., J. Carlsson, et al. (2006). Adoption of mobile devices/ services—searching for answers with the UTAUT. System Sciences, 2006. HICSS'06. Proceedings of the 39th Annual Hawaii International Conference on, IEEE.

Chung, K.-C. & Holdsworth, D.K. (2012). Culture and behavioural intent to adopt mobile commerce among the Y Generation: comparative analyses between Kazakhstan, Morocco and Singapore. Young Consumers: Insight and Ideas for Responsible Marketers, 13(3), pp.224–241.

Constantiou, I.D., Damsgaard, J. & Knutsen, L. (2007). The four incremental steps toward advanced mobile service adoption. Communications of the ACM, 50, pp.51–55.

Constantiou, I.D. & Papazafeiropoulou, A. (2009). Does Culture Affect the Adoption of Advanced Mobile Services, A Comparative Study of Young Adults' Perceptions in Denmark and the UK, 40(4), pp.132–147.

El Kiki, T. & Lawrence, E. (2006) "Government as a Mobile Enterprise: Real-Time, Ubiquitous Government".

Gao, S., S. P. Moe, et al. (2010). An empirical test of the mobile services acceptance model. Mobile Business and 2010 Ninth Global Mobility Roundtable (ICMB-GMR), 2010 Ninth International Conference on, IEEE.

Grist, S., Hafeez-baig, A. & Gururajan, R. (2007). Clinical Usefulness is the Key Common Determinant of Adoption of Wireless Technology in Healthcare for India and Australia University of Southern Queensland TSYS Department of Computer Science. , (Icmb), p.7695.

Hinnant, C.C. & O'Looney, J.A. (2003). Examining pre-adoption interest in online innovations: an exploratory study of e-service personalization in the public sector. IEEE Transactions on Engineering Management, 50.

Hsieh, P.H., Huang, C.S. & Yen, D.C. (2013). Assessing web services of emerging economies in an Eastern country — Taiwan's e-government. Government Information Quarterly, 30(3), pp.267–276.

Hung, S.-Y., Chang, C.-M. & Kuo, S.-R. (2013). User acceptance of mobile e-government services: An empirical study. Government Information Quarterly, 30, pp.33–44. ITU (2010), Mobile Technologies Database.

Juwaheer, T.D., Pudaruth, S. & Ramdin, P. (2012). Factors influencing the adoption of internet banking: a case study of commercial banks in Mauritius.

Kaplan, B. and Maxwell, J.A. (1994) "Qualitative Research Methods for Evaluating Computer Information Systems," in Evaluating Health Care Information Systems: Methods and Applications, pp. 45-68.

Kim, B.G. et al. (2010). Determinants of Actual Use of Mobile Web Browsing Services in Korea: An Empirical Examination. 2010 Ninth International Conference on Mobile Business and 2010 Ninth Global Mobility Roundtable (ICMB-GMR), pp.124–132.

Kim, Y. et al. (2004). Architecture for implementing the mobile government services in Korea. 23rd Internal Conference on Conceptual Modeling: Conceptual Modeling for Advanced Application Domains, First International Workshop on Digital Government: Systems and Technologies, 3289, pp.601–612.

Lancelot Miltgen, C., Popovič, A. & Oliveira, T. (2013). Determinants of end-user acceptance of biometrics: Integrating the "Big 3" of technology acceptance with privacy context. Decision Support Systems, 56, pp.103–114.

Lee, J. & Rao, H.R. (2012). Service source and channel choice in G2C service environments: a model comparison in the anti/counter-terrorism domain1. Information Systems Journal, 22(4), pp.313–341.

Lee, M. (2009). Electronic Commerce Research and Applications Factors influencing the adoption of internet banking : An integration of TAM and TPB with perceived risk and perceived benefit. Electronic Commerce Research and Applications, 8(3), pp.130–141.

Lee, S. (2009). Mobile Internet Services from Consumers' Perspectives. International Journal of Human-Computer Interaction, 25, pp.390–413.

Linders, D. (2011). We-Government : An Anatomy of Citizen Coproduction in the Information Age. , pp.167–176.

Lo, C. (2008). Information & Management An assessment of advanced mobile services acceptance : Contributions from TAM and diffusion theory models. , 45, pp.359–364.

Lu, J. et al. (2008). Determinants of accepting wireless mobile data services in China. Information & Management, 45(1), pp.52–64.

Mallat, N. (2007). Exploring consumer adoption of mobile payments – A qualitative study. The Journal of Strategic Information Systems, 16, pp.413–432.

Mengistu, D., Zo, H.Z.H. & Rho, J.J.R.J.J. (2009). M-government: Opportunities and Challenges to Deliver Mobile Government Services in Developing Countries. 2009 Fourth International Conference on Computer Sciences and Convergence Information Technology.

Nam, T. (2012). Citizens' attitudes toward Open Government and Government 2.0. International Review of Administrative Sciences, 78, pp.346–368.

Nasri, W. & Charfeddine, L. (2012). Factors affecting the adoption of Internet banking in Tunisia: An integration theory of acceptance model and theory of planned behavior. The Journal of High Technology Management Research, 23(1), pp.1–14.

Nikou, S. and J. Mezei (2012). "Evaluation of mobile services and substantial adoption factors with Analytic Hierarchy Process (AHP)." Telecommunications Policy.

Ntaliani, M., Costopoulou, C. & Karetsos, S. (2008). Mobile government : A

challenge for agriculture. , 25, pp.699–716.

Orlikowski, W.J. & Baroudi, J.J.(1991)"Studying Information Technology in Organizations: Research Approaches and Assumptions", Information Systems Research (2), pp. 1-28.

Pearson, J.M., Pearson, A. & Green, D. (2007). Determining the importance of key criteria in web usability. Management Research News, 30(11), pp.816–828.

Scharl, A., Dickinger, A. & Murphy, J. (2005). Diffusion and success factors of mobile marketing. , 4, pp.159–173.

Sheng, H., Nah, F.F. & Siau, K. (2008). An Experimental Study on Ubiquitous Commerce Adoption : Impact of Personalization and Privacy Concerns. Journal of the Association for Information Systems, 9, pp.344–377.

Shieh, L. et al. (2013). Technological Forecasting & Social Change analyzing the factors that affect the adoption of mobile services in Taiwan. Technological   Forecasting & Social Change.

Song, G. (2005). Transcending e-Government : a Case of Mobile Government in Beijing. In The First European Conference on Mobile Government. pp. 1–9.

Susanto, T.D. & Goodwin, R. (2010). Factors Influencing Citizen Adoption of SMS- Based e-Government Services. Electronic Journal of eGovernment,   8, pp.55–70. Thunibat, A. Al, Zin, N.A.M. & Ashaari, N.S., 2010. Mobile government services in Malaysia: Challenges and opportunities. Information Technology (ITSim), 2010 International Symposium in, 3.

Walsham, G. (1993) Interpreting Information Systems in Organizations, Wiley, Chichester.

Wang, C. et al., 2011. M-Government Use: Technology, Context and Environment Determinants. 2011 International Conference of Information Technology, Computer Engineering and Management Sciences, pp.290–293.

Wei, R., Xiaoming, H. & Pan, J. (2011). Telematics and Informatics Examining user behavioral response to SMS ads : Implications for the evolution of the mobile phone as a bona-fide medium. Telematics and Informatics, 27(1), pp.32–41.

Winkler, T.J., Lvova, N. & Günther, O. (2011). Towards transformational IT governance - the case of mobile government adoption. In ECIS 2011 : Proceedings of the 19th European Conference on Information Systems : ICT and Sustainable Service Development.

Xu, D.J. (2006). The Influence of Personalization in Affecting Consumer Attitudes toward Mobile. Journal of Computer Information Systems, 47, pp.9– 19.

Zhou, T. (2013). An empirical examination of continuance intention of mobile payment services. Decision Support Systems, 54(2), pp.1085– 1091.