Mobile Government Implementation for Government Service Delivery in Developing Countries: A South Africa Context

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Abstract - *Mobile phones are becoming the most rapidly adopted technology in history and the most popular and widespread personal technology in the world. Also, the ubiquitous nature of mobile phones in developing countries, for example South Africa provides an opportunity to use of this platform to provide better service delivery to the citizens of the developing countries. This paper identifies major service delivery issues in South Africa. Various m-government systems that have been implemented in other countries to solve service delivery issues were identified. A survey was circulated to citizens and government stakeholders*

Keywords: e-government; m-government; Developing Countries; Service Delivery; South Africa.

1 Introduction

Government can be defined as the dynamic mixture of goals, structures and functions by which a community is ruled [1]. However for a government to achieve its goals, various efforts and opportunities are utilized either through electronic means or traditional paper means. Electronic government (e-government) refers to the delivery of government services through the use of information and communication technologies (ICTs). Mobile government (m-government) which is seen as the subset of e-government is the delivery of government services through wireless technologies, anytime, anywhere by adopting diversity of mobile devices.

The challenges of government services delivery as well as the opportunities of adopting and using wireless and mobile technologies represent pressures and drivers to which modern governments should respond. However, the ubiquitous nature of mobile technologies (particularly mobile phones) in the developing countries (for example South Africa) provides an opportunity to use of this platform to provide better government service to the citizens. E-government is a cost-effective solution that improves communication between government agencies and the citizens by providing access to information and services through using mobile devices. M-government has attracted more and more research interest and focus from national governments and universities [2].

The potentials for m-government in developing countries, however remains largely unexploited. Different human, organizational and technological factors, issues and problems affecting these countries, require focused studies and appropriate approaches. Mobile technology has been referred as an "enabler", but on the other hand it should also be regarded as a challenge and a peril in itself. The organizations, public and private which ignore the potential value and use of mobile technology may suffer crucial competitive disadvantages. Nevertheless, some m-government initiatives have flourished in developing countries too, e.g. India, Kenya, China Brazil etc. The experience in these countries shows that government in the developing countries can effectively and efficiently utilize and appropriate the benefits that mobile technologies offer, but m-government success involves the accommodation of some unique conditions, needs and obstacles. The adaptive challenges of m-government implementation go beyond technology as they also call for organizational structures and skills, new forms of leadership, transformation of public institutions [3].

Moving away from these assertions, the primary aim of this paper is to identify and analyse the primary issues, opportunities and challenges that m-government initiatives present for developing countries. The insights and results presented here are based on an empirical research conducted in South Africa as well as a case studies undertaken in 10 developing countries (Brazil, Chile, China, Columbia, Guatemala, India, Jamaica, Kenya, the Philippines, and South Africa) which have already explored implemented m-government initiatives. In these cases we observe different applications and opportunities for m-government such as tax administration (Jamaica, Guatemala, South Africa), better services to customers businesses and stakeholders in general (Brazil, India), and m-government for transparency and business efficiency (The Philippines, India, Chile).

Furthermore, we investigate the primary m-government needs in South Africa. A survey was constructed regarding this as well as factors that will influence the successful adoption and use of these services. The survey was circulated to the South African citizens where access to traditional internet is limited and as such mobile device is the de facto computer in their hands. We also conduct interview of the stakeholders in various government agencies. We got an

overall implementation perspective on the domain as well as what is needed about the needs of the citizen in the implementation.

The research contributes to the existing body of knowledge in that it identifies specific factors that influence the adoption as well as use of m-government system in the South African context. The factors that are identified and discussed relate to the identified m-government services providing government and the general stakeholders with an overview of what is required to implement the similar services.

2 Literature Review

2.1 Focus Shift in the Public Sector

The emergent of the internet, digital connectivity, the explosion of mobile technology and the use of m-commerce and m-business in the private sector are pressuring the public sector to rethink hierarchical, bureaucratic organizational models. Customers, citizens and businesses in the developing countries are faced with new innovative m-business and m-commerce models implemented on a daily basis by the private sector and made possible by mobile technologies and applications. The same model has be required by the citizens in the developing countries. Citizens are customers for governments due to the fact governments need to empower rather than to serve, focus on prevention rather than to cure, be mission oriented and customer focused and shift to team work and participation rather than to hierarchy.

In recent times, public sector are beginning to understand the potential opportunities offered by the by the mobile and e-business models to fit with the citizens' demands, to offer better services to citizens and to also increase efficiency by streamlining internal process. This means that mobile technology causes a "focus shift" which introduce the age of "network intelligence" by reinventing business, government and individuals. This is because the traditional bureaucratic is being replaced by competitive, knowledge based economy requirements, such as speed up in service delivery, network organization, innovative entrepreneurship, customer driven strategy, flexibility and vertical/horizontal integration [4]. This new focus shift of the government toward m-government strategy, coordinated network building, customer services and external collaboration [5]

2.2 Defining M-government

M-government is a paradigm that means different things to different people. To some, m-government can simply be defined as digital government information or a way of engaging in digital transaction with customers through mobile devices and technologies. To others, m-government consists of the creation of mobile applications where government information about political and government issues is presented.

The definitions and conceptualization of m-government limit the range of opportunities that it offers. And one of the many reasons why m-government initiatives have failed is related to limited definition and lack of total understanding of the concept of m-government, its processes as well as its functions.

M-government is a complex and multifaceted concept that requires a broad definition of and understanding, in order to be able to design and implement a successful m-government strategy. However, the fundamental element of the various m-government definitions is the use of mobile technologies and tools to reinvent the public sector by changing its internal and external way of doing things as well as the relationship with the customers (i.e. the citizens) and the business communities. The analysis of these definitions allows us to individualize the main issue and components that characterize an m-government framework such as:

- Change areas (internal, external, and relational)
- Users, customers, actors and their relationships (citizens, business)
- M-government application domains (mServices, mDemocracy, mAdministration)

2.3 Change Initiatives

The definitions and analysis of m-government provided above incorporate three important change areas. These are:

Internal change, which is the adoption of mobile technologies to improve the efficiency and effectiveness of internal functions as well as processes of government by interrelating different departments and agencies in delivering service to the citizens. Therefore the flow of information among various government agencies and departments occurs at a faster rate, thus reducing processing time and paperwork bottlenecks.

External change which refers to the possibility of using mobile technologies and devices by government to be more transparent to citizens and business, thus providing access to the wide range of information gathered by the government. M-government will also generate opportunities for partnership and collaboration among many government institutions. The lines between within government agencies will not only be blurred but also the lines between the government and those that touch it.

Relational change which refers to the use of m-government implementation to enable the fundamental changes in the relationship between citizens and the government. Through this, vertical and horizontal integration of services and information from various government agencies and other stakeholders get seamless services.

These three change areas shows that m-government initiative does not consist of a simple business process reengineering. It requires a radical thinking of the nature and functioning of the organization and the relationships between

organizations which needs focus in a web of relationships including all levels of business functions in which the boundary inside and outside are permeable and fluid [6]

2.4 Relationship Network of M-Government

M-government aims to target four main groups. These are the citizens, governments (other governments and public agencies), employees and businesses. The transaction that occurs via the mobile platform between the government and each group constitute the m-government network of interactions.

The first group deals with the relationship between the government and the citizens which allows government agencies to communicate and relate with its citizens, which allows accountability, democracy and improvements to public services. The second group is the relationship between various governmental organizations, for example the national government, regional government and local government. This is due to the fact that governments depends on other levels of government within the nation in order to effectively deliver services and allocate responsibilities and in order to realize a single access point, collaboration and cooperation within different governments and agencies is compulsory.

The third group is the relationship that occurs between government and its employees which is an effective ways to bring various employees closer to themselves and the government in order to promote knowledge sharing among the employees. The final group constitutes the relationship between government agencies and private businesses. This allows transaction initiatives such as m-procurement through the use of mobile technologies.

The full exploitation and implementation of the relationship network in the implementation of the m-government initiatives requires the three applications domains of m-government.

2.5 M-government Applications Domain

The domain to which m-government implementation aims to target can be sub divided into three groups. These groups are:

- **mServices** which is aimed at realizing the connections and interrelationship between the government and the citizens in order to deliver automated government service through mobile devices.

- **mDemocracy** which helps to enable relationship and interaction between citizens and the government beyond boundaries

- **mAdministration** which is used to achieve the purpose of mobile automation and computerization of administrative tasks and for realization of strategic connections of internal processes and functions.

These applications domains are considered as overlapping and m-government can be found in the overlapping area of these three application domains thus demonstration the complexity and heterogeneities that are needed to be taken into consideration for ensuring its successful implementation. (Fig. 1)

2.6 M-government Initiative and Implementation in the Developing Countries

Informatics is a field of study that is primarily involved with the application of information, Information Systems and Information and Communication Technologies (ICTs) within organisations. Informatics can therefore be defined as the study of Information, Information Systems and Information and Communications Technologies which is pragmatic to various phenomena [7]. Following this definition of informatics, Government informatics can therefore be defined as the pragmatic use of information, information systems and information and communication technologies within Government organisations. This however incorporates application of m-Government - an extension of e-Government, which is primarily concerned with the delivery of Government services through mobile devices and mobile technologies [8].

Therefore it can be argued that the application of ICT causes a paradigm shift by introducing the age of network intelligence, reinventing businesses by Government and individuals [9]. In line with this, Governments around the world have taking steps towards implementing a wide range of ICT applications in the past decades. Countries have been classified by the United Nations according to the World Economic Situation Prospect (WESP) as developed economies, economies in transition and developing economies [10].

Developed economies include, for example, the United States, Canada, West European countries and Japan; economies in transitions include for example Croatia, Montenegro, Belarus while developing economies include for example Argentina, Brazil, India, Mexico, South Africa and Bulgaria, to mention just a few. For all countries, the application of ICTs for Government reinvention is increasing not only in investment but also in terms of increase in the number of high-profile initiatives that have been launched which are visible in the country. However, majority of these inventions have taken place in the developed countries. These countries are influenced by the fact that an information society will result in economic and social benefits [11]. According to [11], information infrastructures are projected to incite economic growth, increase productivity, create jobs, and improve on the quality of life. Furthermore, there is a big difference between ICT implementation and use between developed and developing countries.

However, there is lack of adequate and sufficient infrastructures such as computer, access to Internet, access to funds, etc. in developing countries. Therefore, the developed countries have an easier way of implementing ICT projects

such as E-Government than the developing countries. Mobile technologies, especially, mobile phones that can be used to access the internet and perform such activities beyond voice data alone have become the computers in the pocket of many citizens in the developing countries [12]. Due to this, concepts such as mobile Government implementation have gained priority, and thereby eliminate access restrictions. In the light of this, Governments in developing countries are trying to foster their capacities to be agile and ubiquitous. Therefore, they are slowly evolving service delivery towards mobile devices. However, this reality needs careful analysis, prototyping and evaluation of services to investigate whether any change leading to this forms of service delivery, and/or access, will be accepted by citizens and implemented by the Government.

2.7   M-government Readiness in South Africa

Public service delivery is an important and topical issue in any country. Citizens depend on the Government to deliver services effectively and efficiently. A true reflection of democracy has been displayed through the South African Government for more than a decade and many citizens in many developing countries have been restless because of election promises and manifestoes that have not been kept. In recent years, e-Government implementation has been highlighted as a significant contributor to public service delivery.

However this contribution is not directly visible to the majority of the public for which the services are meant for and much of e-Government take place "behind the scenes" and these "behind the scenes" involves activities which include storage of data and records pertaining to every aspect of citizens from birth to death. The South African national e-Government strategy addresses each of these phases in a citizen's life by developing e-Government services relate to each life phase [13].

Although, some South African provincial Governments, for example [13] have made significant progress towards the implementation of e-Government, the state of e-Government in South Africa at the national level however is still at the rudimentary stages [14]. There are various reasons for such an evaluation, the major reason being the lack of facilitation to update and adopt e-Government services by the majority of the citizens and an evaluation of the expectation of the citizens who are the primary users of the system [15].

Furthermore, indications are rife that most of the grumbled communities will not be appeased through the implementation of e-Government. This is because, this will not always be evident and directly visible to the citizens largely due to lack of internet connectivity [15]. However, Machiavelli [16] argue that "*There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things*". This argument also applies to the adoption of

mobile and wireless technologies in the delivery of Government service to the citizens.

More than 93% of South Africans have access to mobile phones while 90% are owners of mobile phones [17]. This high penetration of mobile technologies presents an opportunity to reach an exceptionally broad base of citizens in the developing countries (for example South Africa). This has raised motivation for mobile Government service implementation.

Also, Government has the responsibility to deliver quality service and information to the citizens at all levels of life. These services and information that are sometimes critical are needed by citizens in making decisions and forming opinion. This helps them to feel a part of the Government [18]. This also allows timely service delivery to the public and therefore helps to promote public participation in democracy and creates accountability and transparency [18]. To this end, mobile technology has proven to be a critical channel through which the Government delivers services and information to the citizen. This is called Government to citizen (G2C) service delivery [18] and citizen communication with the Government (C2G and M-democracy) [19]. This also includes Government's delivery of service to the business (G2B) and business interacting with the Government (B2G).

3   Research Methodology

The aim of this research is to identify and analyse the primary issues, opportunities and challenges that m-government initiatives present for developing countries. After the empirical research was conducted which was based on the case studies undertaken in other developing countries, we turned to the research question: *How can the Government incorporate the use of mobile cellular technologies to improve the provision and reach of government services?*

An interpretivist philosophy was adopted in this research. The research instrument that was selected for the purpose of this research is a questionnaire survey which consists of both qualitative and quantitative questions. This is available from the authors upon request. The decision to arrive at the questionnaire that was developed is based on the Besides the demographic information questions, the instrument has a section gauging on how the citizens would like to use their mobile devices to interact with the government if given the opportunity in South Africa. A final section uses the constructs taken from the UTAUT model to gauge what factors might influence the success of mobile government implementation and how important are these constructs. One of the key factor to the adoption of m-government implementation by the citizens was identified as: at what cost a citizen would be using his /her mobile devices for m-government system? Furthermore, we conduct an interview of the stakeholders, majority of who are senior government employees in order to gauge information on the

factors that may be responsible success and failure of m-government implementation in the developing countries.

The majority of the population identified for data collection include citizens from the bottom of the pyramid who do not have access to traditional internet connectivity and who are living in the rural communities but have access to mobile phone that can be used to access the internet. The sample consist at least two rural communities in 7 provinces of South Africa (South Africa has 9 provinces in total). These respondents have been selected as suitable due to the fact that they constitute the largest number of those who need access to one or more government services and as such our research objectives directly point to them. There was a particular focus on citizens between ages 18 – 35.

3.1 Data Analysis

3.1.1 Respondent Demographics

Responses were collected from more than 750 citizens during the data collection process and 653 of these were included in the dataset. The other responses were excluded due to one error or the other. Furthermore data was collected from 5 senior government employees.

3.1.2 Respondent Analysis

Respondents were asked various questions in relations to how they would love to interact with the government in terms of the government service delivery. After the elicitation of demographic information, we gathered information about the capability of the mobile phones of the responded. We gathered that 74 percent of the respondent have mobile phones that has capabilities of either smart phones or feature phones. On the issue of the convenient of using their phones to communicate with the government. 81 percent of the total respondents explained that they feel convenient using their phones in this manner. With participation in politics, 77 percent said that they will be willing to participate in politics with their mobile phones.

Furthermore, 90 percent of the total respondents said that they feel secured using their phones to communicate or transact with the government. Further informal interviews on this reveals that respondents feel that, their information is submitted to the government one way or the other during transaction with the government. On the issue of the reason why respondents would prefer using their mobile phones to communicate with the government. The majority of the respondents (95 percent) agrees that it saves times, money and Queue as it is convenient. The researcher further enquire about barrier that will not allow them to adopt m-government system implementation. From this, we gathered that language and cost will be barrier to m-government system implementation. We further investigated this. Therefore, we review some academic literature regarding the successful adoption of mobile government system, we find out that the major bone of contention, truly is the question of who pays

for what. However, 68 percent respondents said that they are willing to bear the cost as long as it will save them time and energy.

4 Conclusion

The infrastructures and realities of Africa in general and South Africa in specific present various challenges for the integration of Mobile-Government in the way government runs its business to ensure quality service delivery and better dividends of democracy. Mobile phones are largely a pervasive presence in the larger part of the community and it although not free, is stable and nearly ubiquitous. There are numerous advantages for using existing technology and infrastructure for government to ensure quality service delivery. However, little research has been done on the use of mobile technology in social research in an African context which is differ distinctively from the rest of the world as the technology is not primarily used for the mobility that it offers but for the ability to access communities, collaborate and communicate. There are very limited applications on mobile available to support government business in ensuring quality service deliveries. This research study has highlighted some of the potential ways in which m-government systems implementation will help empowerment the citizens in the developing countries.

Therefore, m-government implementation will create an opportunity for African and other developing countries to take advantage of mobile phones as a crucial tool for empowerment and development in developing countries, Africa in particular. It will enable a standardized and framework-based approach to delivering government services to citizens, thereby enhancing citizens' participation in the democratic process. This can only be achieved by utilizing various functionalities of mobile phones, in ways that make sense in Africa, while the issues addressed above are taking into proper consideration. Although, this may seem to be a very African approach, we are convinced that the use of the mobile phone as the computing tool of choice in government service delivery will quickly be emulated in other developing countries. This is due to the fact that these devices are becoming more powerful, more ubiquitous and even more multi-functional.

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