Exploring the Success, Failure and Factors Influencing M-Government Implementation in Developing Countries

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Abstract: The proliferation of mobile technologies and mobile phones has presented an opportunity for Government in the developing countries to utilize Mobile Information and Communication Technologies (M-ICT) to help facilitate daily administration and to provide better services to citizens, businesses, and government agencies through using mobile technology. This research reviews the success, failures and factors influencing m-Government development and implementation in developing countries. The characteristic challenges that developing countries face, which make m-Government implementation in developing countries fail to succeed are identified and integrated. The paper also presents results of literature review of case studies from both developed and developing countries and preliminary studies grounded in the South Africa m-Government reality. The key factors are identified, integrated and characterised under common broad categories. These results were given in a rich picture of m-Government implementation experience that helps to identify possible solutions. A descriptive framework for categorising key factors in m-Government implementation in developing countries illustrated with suggestions from the literature is proposed. The input variables are characterised into factors for success (drivers and enablers), and factors for failure (barriers and inhibitors). The output variables are categorized into organisational and technological benefits. Finally, an action plan for success is proposed. This action contains suggestions for increasing the impact of factors for success while reducing the impact of factors for failure.

Keywords: E-Government, M-Government, Mobile Technology, Developing Countries, Framework

1. Introduction

The rapid development of Information and Communication Technology (ICT) and demand for better, more efficient and more effective Government service deliveries in most developing countries have pushed some Governments in the developing countries to pursue e-Government initiatives in order to be able to offer more information and online services to the citizens, business, government agencies and others. E-government is the application of ICT to government services in order to improve the activities of public sector organizations and enhance the effectiveness and efficiency of information, as well as the quality of service delivery among organizations, business and citizens [1]. E-government presents opportunities to utilize information and communication technologies to help Government facilitate their daily administration and also to implement a relocation of Government services from Government offices to locations that are closer to the citizens.

Examples of such locations are cyber café, telecenters, or a personal computer at home or office.

However, challenges, such as limitation to fixed line Internet by many citizens, faced by the Government in implementing e-Government to ensure delivery of services, have led some Governments to shift their attention to m-Government as the ultimate target and extension of e-Government [2]. This is largely due to the development in mobile technology and the mobility of people with respect to the use of mobile devices and technologies that surround it [2]. Mobile Government or simply m-Government is the strategy and its implementation involving the utilization of all kinds of wireless and mobile technology, services, applications and devices for improving benefits to the parties involved in e-Government including citizens, businesses and all Government units[3].

The penetration of mobile phone technologies in Africa and other developing countries is such that the line between the mobile phone and desktop has blurred. This is because mobile devices have become the computers in the pocket of every citizen, both in Africa and other developing countries to the point that it is no longer a case of digital divide but that of digital difference. Therefore, providing Government Information and communications technologies (ICT) services through mobile phone technologies can lead to sustained economic growth and human development. This is because Mobile technologies are increasingly used as a transformational tool to foster economic growth, accelerate knowledge transfer, develop local capacities, raise productivity, and alleviate poverty in a variety of sectors [4]. Due to this, mobile phone technologies development has become a key strategic area for policy engagement in emerging economies in the last decade. This is because it will help in delivering effective service delivery to the citizens [4].

While the benefits of implementing mobile Government cannot be overemphasized in Governments, there are several concerns about its success as well as the strategies to be adopted in implementing the system in various developing countries. This paper presents the research findings of literature review, knowledge gained from reviewed case studies from developing countries and a preliminary study based on South African Government. The paper takes into consideration various challenges that are faced by developing countries that make implementing mobile Government system difficult to succeed. A descriptive framework for implementing a successful mobile Government system is proposed.

2. Mobile Government Initiatives

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 [5]. 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 [6].

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 [7]. 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 [8].

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 [9]. According to [9] 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 [10]. 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.

2.1 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 citizens, life by developing e-Government services relate to each life phase [11].

Although, some South African provincial Governments, for example [11] 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 [12]. 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 [13]

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 [13]. However, Machiavelli [14] 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 [15]. 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 [16]. This also allows timely service delivery to the public and therefore helps to promote public participation in democracy and creates accountability and transparency [16]. 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 [16] and citizen communication with the Government (C2G and M-democracy) [17]. This also includes Government's delivery of service to the business (G2B) and business interacting with the Government (B2G).

3.   M-Government Implementation Performance Evaluation

According to [18], ICT evaluation can be defined as determining by quantitative, and/or qualitative methods the value of the ICT to the organisation. As m-Government project implementation also applies to the ICT category, then one can also define M-Government implementation as determining by quantitative, and/or qualitative methods the value of m-Government project implementation to the Government and citizens. However, the performance cannot be adjudicated as good or bad without a successful implementation of the m-Government project. In this research paper, the technical or operation implementation of m-Government project as well as it acceptance is of interest.

Evaluating m-Government projects can be a daunting task and this can be subjective. This is because there is no single method that can be applied to any or all situations. However, the literature review that was conducted which was drawn from various case studies across developed countries shows that evaluation leads to the determination of success or failure of an m-Government project implementation.

4.   M-Government Project Implementation Success or Failure

According to literatures, for example [19], [20] it has been proven that management of ICT projects in developing countries has a poor reputation. However, a careful review of reasons for failure identifies other factors whose presence or absence determines success or failure of projects. To start with, we look at the outcome variables which signifies the benefit that can be achieved if m-Government initiatives succeeds. The reason for this is to be able to clarify the goals of m-Government project - which may form a substantial element to the planning process. Achievement of these goals will help to determine how to classify m-Government projects. Furthermore, the perceptions of and reasons for M-Government failure were reviewed which helped us to identify possible substantial variables.

4.1   Outcome Variables

There are many benefits can be achieved with the adoption of mobile technologies in Government service delivery. However, it is important to note that using mobile technology for Government service delivery to the citizens should only be seen as a means to an end and not an end in itself. The value of mobile technology adoption lies in its ability to assist

the Government in finding solutions to its problems in delivering quality service to the citizens. Expenditure incurred in this case can only be justified if there are benefits accruing to it and not adopting it for the sake of adopting it.

Below are some of benefits of adopting mobile technologies for Government service delivery:

- Quality of service delivery
- Increase in the capacity of Government
- Improved citizen participation in democracy
- Improved Transparency
- Increase in the efficiency
- Increase and improve access to information
- Cost reduction
- Improve decision making

4.2   Categorization of M-Government Failure

According to [21] there are two dimensions in which ICT failure can be discussed. These are horizontal and vertical dimensions. The horizontal dimension is expressed in terms of the difference between development failure and use failure, while vertical dimension is expressed in terms of failure at the level of ICT systems, IS projects, or organization, or at the level of the external environment. Furthermore, [21] argue that six types of IS failures can be identified and these are stated below:

- Technical failure
- Project failure
- Organizational failure
- Environmental failure
- Developmental failure
- Use failure

Therefore, the issue of m-Government failure discussion will be done by learning from Information System (IS) failures. This is because this provide us with important lessons in formulating successful strategies for the planning, development, implementation

Following the analysis and argument presented by [20], m-Government implementation success or failure in developing countries can be categorized into three depending on three degree of success. The first is the total failure of an initiative never implemented or in which a new system was implemented and immediately abandoned. Second is the partial failure of an initiative, in which major goals are unattained or in which there are significant undesirable outcomes. Associated with partial failure is the sustainability failure where an initiative first succeeds but is then abandoned after a year or so. The last is success of an initiative where most stakeholders attain their major goals and do not experience undesirable outcomes. For the purpose of this paper. [20] categorization is very important in this paper as it can be used to categorize some of the ICT projects that has been implemented by the South African projects so far.

5.   Factors Influencing M-Government Project Implementation in Developing Countries

For the purpose of this paper, the factors influencing m-Government implementation in developing countries are those that directly have influence on it success and/or failure. Therefore, when discussing factors influencing m-Government implementation in developing countries, it is important to elucidate the "contrary" effect.

5.1 Factors Influencing Success

These are factors whose presence or absence determines the success of an m-government project. They are drivers or enablers. Their absence can cause failure and their presence can cause success.

Drivers are the factors influencing the successful m-Government implementation. According to the research carried out, some of these factors are listed below:

- Strategy and Vision
- Rising expectation from the citizens
- Support from the Government
- External pressure and donor support
- Change in technology and modernization

Enablers on the other hand are the actors within the society that are active and play major role to make sure that the possible barriers are eradicated. Some of these are listed below:

- Good practice
- Effective project management, organisation and change management

5.2 Factors Influencing Failure

The factors for failure are those circumstances that constraint proper and accurate m-Government implementation for Government service delivery. This can either be inhibitors or barriers.

Inhibitors do not necessarily prevent m-Government implementation but they prevent advancement and limit successful implementation and sustainability. Some of these factors for failure are listed below.

- Technology
- M-Government policy
- Donor follow-up
- Effective coordination
- User needs

Barriers are those occurrences that hinder m-Government implementation. Some of these factors are listed below:

- Citizens and Government officials attitudes towards the adoption of m-Government
- Infrastructure
- Finance
- Leadership, culture and bureaucracy
- Compatibility issues

6. Action for Successful M-Government Implementation

The best way to maximize the benefit of m-Government implementation is to make sure that all the factors for success are put in place while also making sure that there is no occurrence of any of the factors for failure. It is important to note that this may not be the case in a real world situation. Given such a situation, an action to increase the chances of success is required. Based on the work of [22], we suggested a five staged framework for m-Government implementation. This consists of the following:

- Examine the m-readiness
- Identify and prioritize themes
- Develop a system of action
- Apply to target groups

- Define and implement solutions

The first stage is the examination of the m-readiness of the country. For the purpose of this paper, m-readiness is the situation where Government take the advantage of mobile technologies as a resource to improve its service delivery functions. This means that m-readiness can be used as an information elicitation mechanism for Government as the strategies for m-Government implementation is being planned. The last stage of the framework is the implementation of the solution. A significant factor at this stage is to make sure that Government is ready and also is in position to realize new and innovative activities.

6.1 A Conceptual Framework: Developing Countries Context

Figure 1 presents the proposed framework that can be used to chart the knowledge gain from both the literature review and case study. This framework presents a conceptual format of the literature for representational purpose. The input variables are those factors considered as input to m-Government project. When some of these factors are absent or are present but they constitute obstacles to success, they constitute factors for failure.

The input variables that act as the groundwork of the m-Government project and are considered as principal ingredients to ensure the success of the project are referred to as drivers while those variables that encourage success are referred to as enablers. It is important to map the input variables to assess where action should be taken as progress are recorded in m-Government implementation.

Output variables are represented as either organisational or technological benefits. The organisational benefits are the benefits that accrue to the Government organisation implementing m-Government. Technological benefits may not necessarily accrue to the organisation but are regarded as benefits resulting from implementation of the m-Government. These benefits can be enjoyed by individuals, the organisation and the public.

Finally, the framework shows the response, which is presented as action for successful m-Government implementation. The response proposed has three characteristics. First, it analyses the situation, second, it looks at the various factors contributing to success and/or failure and lastly an action for success to a situation specific action.
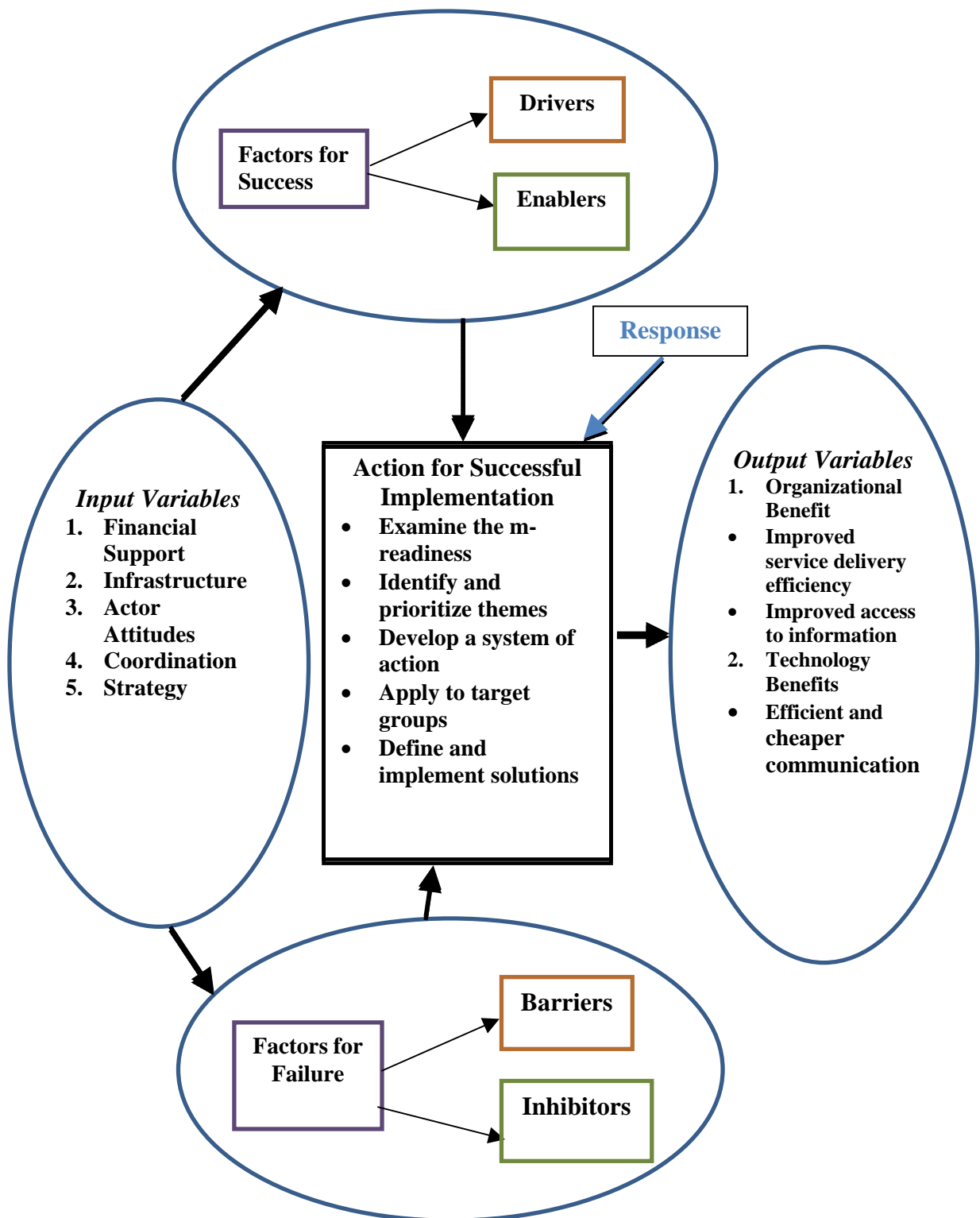
Figure 1: Conceptual Framework for M-Government Implementation

7. Conclusions

The implementation of e-Government in developing countries, specifically as far as citizen interaction is concerned, has largely been far less successful than initially hoped for. Strong contributing factors to this were the lack of Governmental readiness and capacity, as well as the lack of Internet access by citizens. M-Government has been seen as a great enabler as far as citizen access is concerned: the mobile devices in the form mobile phones have experienced a phenomenal adoption rate ad become commonplace in developing countries. Thus the promise of m-Government is held high. However, proponents of m-Government often fail to take into account that other factors still need to be addressed for m-Government to become successful. This paper set out to do just that by exploring the success, failure and other influencing factors affecting the successful implementation of m-Government in developing countries.

We combined insights from the literature with empirical evidence from a case study to propose a conceptual framework for m-Government implementation. The framework consists of five major components: a listing of general input factors which impact m-Government projects, an enumeration of these in factors which enhance (drive or enable) success or those which contribute towards failure (barriers or inhibitors), the manner in which these must be taken into account when actioning an m-Government project and, finally, the various possible outcome factors which must be considered for the project's impact and success.

This framework can be used for a number of different purposes. Firstly, it can be used as an analytical instrument by both researchers and assessors, for instance in analysing and specifying international support and cooperation from all actors involved in the implementation i.e. both the Government officials, citizens and funding partner. Secondly, it can also be used in a more prescriptive manner, for instance to produce guidelines that the Governments can use to help define their needs with regard to m-Government implementation and use thereof, or by practitioners aiming to implement a successful m-Government project.

Future research can focus on unpacking and elaborating the various components to a much greater level of detail, with perhaps adding in contextual factors impacting differentially on the relative importance of the identified factors and variables. Inevitably, future research should also be informed by additional empirical evidence derived from a number of m-Government projects – across the entire continuum from highly successful to complete failure.

It is from this need for further empirical validation that exciting opportunities exist for stronger research cooperation between Europe and Africa. In addition to the historically strong collaborative associations, cooperative research allows for a richer and more varied sample of m-Government projects, enabling a more critical analysis of the role of contextual influencing and moderating variables such as socio-cultural and structural contexts. We envisage that this will unpack the sometimes presumed homogeneity of 'developing country context' into a much more nuanced and diverse set of contextual variables and understandings.

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