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DESIGNING THE CONTENT OF M-GOVERNMENT FRAMEWORK

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ABSTRACT

E-government services have become a critical asset for many countries to achieve their mission, policies and vision In this paper we focus on the implementation of mobile technology in the public sector M-government is considered as a part of e-government project any government likes to implement m-government services or application may meet some challenges that related to mobile technology This paper proposes a new framework for adapting the content of Mobil-government services with respect of four contexts; personal, device, connectivity and location contexts. The paper also highlights the main guidelines that help improving Mobile -government content.

KEYWORDS: Electronic Government, Mobile Government, M-Government Framework, Mobile Government Adoption

INTRODUCTION

Information and communication technology (ICT) have become a critical asset for many governments in many countries, because everything in the life depends on it Any government who wants to develop its operations, services and increase quality, productivity, effectiveness and performance needs to employ information technology to support that.

Many governments in different countries go ahead to use electronic government (e-government). Those governments will use ICT tools and features to enhance service level and reduce the time which is needed to achieve government transaction and increase the flexibility to achieve this transaction and riddance from repetition and manual tasks at government departments Any government can achieve all those benefits by using information and communication technology devices and features such as network internet wireless technology [3].

Today the increase of using mobile devices among people with different levels leads us to ideating how this device will be used to improve and develop government activities The government can use mobile as new tool or method to increase interaction between government and citizens The government can use it to publish and disseminate government information at easy and quick manner They can use it to deliver public service in different sectors. For Example, Mobile learning for delivery public services in education sector and mobile health use to delivery health services in public health departments or hospitals. Another aspect about mobile technology is quickly develop new services and features that is allow people to achieve more transactions and activities in easy and flexible manner. This technology available any time, any place and anything for example, the user can open E-mail and view face book account by use mobile devices when it connect with internet technology at any time and any place [12].

The first motive to do this study is that mobile device has become as cultural tool among all people levels such as students, employees, managers and all the levels of citizens.

When relocating the services that are provided by an E-government platform to services provided by M-government platform, many issues and problems will emerge One of the most important challenges we focus on is the

designing and the adaptation of the content, which is provided to users through M- government informational and operational functions, in order to fit the different capabilities and limitations of mobile devices and wireless technologies and to support the mobility of the user.

LITERATURE REVIEW

Designing the content of M-government services is an important research area. In [9], the authors discussed some technical and policy consideration related to M-government. One of the important issues that were described in [9] is the content and presentation management. The authors suggested some useful guidelines to handle this issue such as utilizing Content Management Systems (CMS) to add a formal structure to the content and to adopt enterprise-wide web and content design standards, using the Extensible Markup Language (XML), Extensible Style sheet Language (XSL), and employing Simple Object Access Protocol (SOAP) technology.

Another interesting research in M-government adaptation is presented in[1]. The authors examined location awareness and personalization techniques to ensure the importance in delivering the right service to the right users. The authors also proposed *a* logical architecture for governmental location based services which improved the creation of Intelligent M-government services that match the best option of a service to the targeted user.

The architecture includes four main components, they are: content server, application server, gateway and mobile location center. In [3][24], the authors proposed a framework to understand mobile technologies and their implications for M-government applications as shown in Figure 1 below

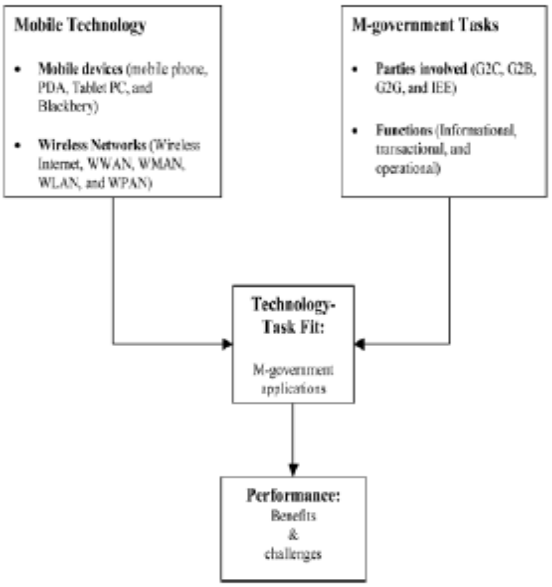

Figure 1: M-Government Framework [3]

According to the framework the authors analyzed M-government applications and evaluated the mobile technologies (MTs) that are used in M-government. They have also categorized E-government services that can be provided through these technologies. Furthermore, the authors discussed the benefits and challenges of M-government in order to measure the degree of fit between MTs and government tasks and services performed through them.

M-Government Overview

Mobile-government or m-government involves enhance of government services, tasks and performance [6]. For example when government use SMS service to publish specific government information to specific group of citizens

M-government used to delivery service and exchange information both citizen and business and another government this idea deal with e-government types that is, mobile technology can use to support C2G model (Government-To-Citizen), C2B model (Government-To-Business) and G2G model (Government-To-Government).

According to Mobile Government Consortium International[17]. M-government define as new technologies and new channels that use in public sectors to gain several benefits like increase efficiency productivity delivery service for both business and citizens from government, and increase interaction and corporation between interacting with all stakeholders.

M-government consider a part of e-government tools [8], that is, e-government use set of tools devices and technologies such as internet television, cell phone and personal digital assistants All of those technologies use to achieve government goals, missions or policies and mobile technology play as enabler devices to automated operations and activities in public organization.

Mobile government as term define as concept different from mobile commerce because m-government use from organization in public sector for government activities For example, mobile may use as assistance tool in democracy or voting process But m-commerce refers to use mobile technology to, interact, and transact and exchange service and information to achieve commerce transaction[13] We can depend on two factors to identify the different between m-commerce and m-government first factor is nature the process and second factors is type of organization use mobile if private or public organization

We can also identify similar point between them are both mobile commerce and mobile government use mobile devices and technology to achieve their activities and transaction

Benefits of M-Government

Mobile government act as convenient communication tool to delivery government services and publishing information about government procedures, legal policies and this technology became convenient tool because it can reach to different citizens in different cities and even to most remote and disadvantaged people in countries [20].

According to study conduct in England this study conduct to identify impact of short message system (SMS) on change people behaviors, the result from study is delivery short message that include health advices such as smoking cessation in public location like school bus station or organization [7]. Delivery health information by SMS service has impact to modify citizen behavior SMS services can reach for wide population and can send message for individually and it allow instant delivery with asynchronous feature

Mobile can enhance access to government information and provide service for each citizens, businesses and other government organizations [18][26]. Mobile easy to buy because it inexpensive and available for each citizens such as employees, students, teachers, experts, public figures, and government officials.

Several new business opportunities are developing and appearing because mobile technology sector quickly development to add new features or service on mobile devices [16], which is with development mobile features also government can add new services to enhance government services for citizens, visitors, business partners and government employees

The government should be act like private sector when utilize mobile technology (m-commerce) to increase their profit market share and competitive advantage So any government should add new services to enhance their citizen lives or other government objectives

M-government has mobility features that is, any government can reach for mobile devices holder at anytime and anywhere[11] [28].

Mobile device has ubiquitous feature that is a part of mobility feature. Ubiquitous as concept define as the mobile services available at every where [2]. Also from motive to use mobile technology is the mobile easy to use from citizens because it became part from their live [5].

Today mobile device do not used just to conduct voice communication So it consider device for multiple uses such as send messages Blue tooth listen music and take picture by phone camera and if mobile connecting with internet; they can used it to send data, exchanging e-mails [19], and doing small business transactions and they may use it to access networks of friends or potential friends by use mobile device [12]. All of those use will increase the number of citizens owned mobile phones this is will act as motive to implement m-government.

Implement mobile technology in public sector will increase efficiency and effectiveness of government employees, productivity and improving performance and reduce number of steps to complete government transaction and reduce number of visitors into government officials, this is will reduce the time and effort to do government activities Another m-government provide opportunities for citizens participation in police and democracy process and decision making [27].

Mobile- Government Framework

Mobile consider complementary part to e-government because m-government aim to achieve the same objectives for e-government and e-government consider complementary part of government So any government will implement a good tools to enhance public sector, improve delivery government services for both citizens and businesses, reduce government management, save cost, reduce effort, increase transparency and reduce corruption[9].

And another point in the relation between government e-government and m-government that is all the part work in the public sector [10][23].

Mobile technology will use to achieve e-government initiative and the mobile should be achieve it within specific principle like Interoperability, Security Openness and Flexibility [4]. For example, when citizens or private company want pay tax by use mobile device, this transaction should be conduct with a good security procedure.

In summary there are interrelated dependence relation between government, E-government and M-government and all parts work to serve citizens business and other government and all parts work in public sector, and government is primary part of this relation that is, without government sector no e-government and m-government.

Mobile-Government Applications

In this section we will explain some of mobile government applications that delivery specific services for both citizens and businesses this application implement in public sector for example m-health m-learning, m-Democracy, m-payment and m-transport [15].

Mobile Democracy

Use mobile to improvement relation between government and citizens and m-democracy can reach into large population of citizens in country because mobile communication available to do this service [25]. The government can use it also to distribute political information however, as example on mobile democracy we will take M - voting system and M– COGNOCRACY.

M-Voting System

The government can use mobile devices to enable citizens participate in choosing political candidates for government council, this system will act as complementary for e-voting system and voting process with mobile device became more stable and flexible for many citizens because it available any time and at anywhere[6].

M-voting system can use set of technologies such as SMS, Multimedia message service (MMS). Any government will implement this system need a good security procedure to ensure transparency in voting process.

M – Cognocracy

A new model that support e-citizens The citizen can participate in government making decisions and evaluate the alternatives[22], the government can take citizens opinions by voting on specific decision or problems at specific the time and place by using mobile communication devices.

Use M-Cognocracy will increase citizens involvement, better informed, more analytical increase transparency and increase citizens satisfaction because they will participation in government decision making Any government can use it because the mobile device has mobility features (anytime, anywhere).

Mobile Health

Mobile technology support various medical services such as patient registration publishing health information, access to medical test results and schedule appointment with available doctors in the specific date, the most technology use to achieve that is SMS service for query or exchange health information [14]. And many advantages from implement mobile technology with public health sector like provide advices for patient in other country.

Mobile Learning

Any implement for communication and information technology in public education section this consider mobile learning if can depend on mobile technology [21], For example use mobile Bluetooth to increase corporation between students and other students and with teacher at the same time and my exchange information and materials between each other

PROPOSED FRAMEWORK

M-government informational functions can provide end users with online published information and can send alerts and notifications to users while operational functions enable government employees to access any needed information from remote locations. In the following sections, we introduce our adaptive M-government framework.

Content adaptation is a key part in the process of designing M-government applications. In other words, we have to adapt the content presentation to meet the user preferences and the different capabilities and limitations of mobile devices and wireless technologies that are used by different users.

Thus, to adapt the presentation of the M-government content we have to take into consideration four main contexts which are: personal context, mobile device context, connectivity context and location context Figure 2.

Personal context includes any information that is used to describe the user personal matters such as name, gender, date of birth and his service and content preferences The device context is any information that is used to characterize the user mobile device. It is a crucial issue to specify the user device capabilities in M-government application because they can have a big impact on what content is appropriate and meaningful to be delivered to the user. Some of parameters that

characterize mobile devices are the main factors that will be used to characterize this context such as device type and device screen resolution.

Nowadays mobile devices can be connected to Internet through different wireless technologies. Each of them has different data transfer rate. As a result, we have to specify the type of wireless technology that will be used by the user to connect his device to the Internet and this is called the connectivity context.

Users with mobile devices may need some kind of information related to their location such as the nearest hospital, police station or any other information. Therefore, the location context will include any information that describes the user location.

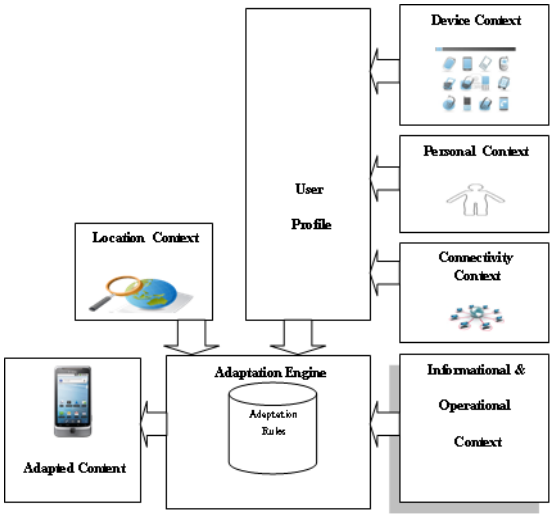

Figure 2: Adaptive M-Government Content Framework

As shown in Figure 2, our adaptive model takes into account several factors from four context categories. The values of factors that are almost stable will be saved at the user profile and they will be used as inputs on the adaptation engine. None of the location context factors will be included in the user profile since all of their values regularly change. Finally, the adaptation engine specifies which presentation type is most appropriate to the user according to predefined set of rules. As a result, each user can receive an adaptive content that meet his preferences and is compatible with his mobile device and wireless technology. The following list describes some good examples that clarify how the framework can perform in different scenarios:

- By analyzing the user profile based on the date of birth and user gender from the personal context, governmental health clinics and is tribute personalized announcement to women older than 45 years to have a screening mammogram at the end of this month.
- A policeman can search a suspect criminal photo from his mobile device that is wirelessly connected to a remote database. According to our adaptive model the system will check the policeman profile to determine the user device type. If the device type equal to PDA, the image will be displayed to him in a resolution less than 240x320 pixels while if his device type is a cell phone the image should be less than 120x160 pixels.
- Some government services aim to develop public awareness about a specific issue, such as the negative impact of smoking. The content can be displayed as animation with different resolution to fit the user device screen.

Moreover, according to the wireless connection that is used, the content can be displayed as text, audio or animation. For instance, if the user is connecting the internet through GPRS, he can receive aimated content while if he

was using WAP that have a lower data transfer rates he cannot receive animated content because it will take a long time to be downloaded on his device.

In order to facilitate the effective presentation of the governmental websites through mobile devices and wireless technologies we propose the following guidelines:

- Reduce the number of the graphical content in the interfaces because it will increase the time that are needed to download the content and it will take a large space of the small mobile devices' screens.
- Governmental services provided in a specific web interface must be presented to the user as a menu of hyperlinks to minimize the user need to scroll the content horizontally as much as possible.
- It is also important to rank the available public services provided to the user according to his priority by analyzing his previous interactions with the system.

CONDUCTION

The mobile technology can be used in everyday life and more suitable to implement within any countries because the mobile has mobility features, any m-government has benefits for both citizens, businesses and employees government For example enhance the quality of government services and publishing government information and increase citizens involvement and participation in government decision.

M- government increase the competitive advantages between the countries to provide new services depend on mobile technology this competitive lead to building a new strategy mission policies and plan to provide new services via mobile technology such as SMS system. For future work with m-government filed we can prepare study to building information system depend on mobile technology to increase government transparency and reduce from management corruption in public sectors some limited for this study like not all people own mobile devices with advance technology features such as Bluetooth wireless connection with internet multimedia features this limited special appear in the poor area within any country

This paper proposed a framework that improves the provision of M-government services by delivering personalized and adapted service content to the appropriate user efficiently and effectively. The framework considers different factors that characterize four contexts which are: the personal, device, connectivity and location contexts. The possible values for each factor will influence the content presentation type. We found that the same content must be found in different presentation types and in more than one resolution for graphical content, to fit different mobile devices and wireless technologies.

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