

Mobile Government Next Generation as Development Gateway to M-services

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Abstract

This research aims to use the mobile device to access the applications and web services which are available on E-government portal by using private local network (intranet). Mobile network, mobile devices and mobile services are developed which construct the M-government in order to extend the horizon of online government services and maximize benefits from e-services. The suggested m-government used Wimax Technology as media based the framework of open source operating system. The main targets of our work are to provide more power security for the information that exchange through intranet, the cost of infrastructure will reduced against that is in ordinary E-government and the added value of our work to support peoples those are live courtyard to uses e-services. In the practical side we design a prototype of m-PORTAL and MSC (mobile switching center) to prove our concept.

Keywords: M-government, e-government, Mportal, M-Services and Mobile Switching Center

الحكومة الجواله الجيل القادم لتطوير بوابة خدمات الهاتف النقال

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الخلاصة

يهدف البحث إلى استخدام جهاز الموبايل للوصول إلى تطبيقات وخدمات الويب المتوفرة على بوابة الحكومة الالكترونية باستخدام الشبكة المحلية الخاصة (الانترانيت) والتي تعتمد على تقنية Wimax وتعتمد تلك الخدمات والتطبيقات على بنية المصدر المفتوح وعدم استخدام شبكات الهاتف النقال العاملة. وقد استهدف البحث توفير أمنية عالية للمعلومات المتناقلة عبر شبكة اللاسلكية وتقليل الكلف فيما يخص البني التحتية للحكومة الالكترونية والاستفادة الأكثر أهمية من نتائج البحث من خلال استخدام الهاتف النقال في المناطق النائية مثل القرى والأرياف. في الجانب العملي تم تصميم نموذج بوابة الكترونية لغرض إثبات فكرة البحث.

الكلمات المفتاحية: الحكومة الجواله، الحكومة الالكترونية، بوابة الهاتف النقال، الخدمات الالكترونية.

Introduction

E-government efforts aim to benefit from the use of most innovative forms of information technologies, particularly web-based Internet applications, in improving governments' fundamental functions. These functions are now spreading the use of mobile and wireless technologies and creating a new direction of mobile government (m-government). M-government is defined as 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 (Al Thunibat, 2010) Mobile e-government is a new e-government application model that develops on the basis of traditional e-government. It mainly utilizes mobile termination (MT) to have real-time access to e-government platform through mobile communication wireless network, in order to realize real time information interaction between civil servants in governments and the general public. This kind of model can adequately break the double limits of time and region, and provide convenient mobile e-government information services for all levels of governments, enterprises and public institutions, social

groups and the general public (Mukherjee,2005)(Shahkooh ,2007).

Today, the use and the development of wireless web technology (e.g. portal technology running on wireless handheld devices)

(Zarei,2008) (Garcia,2005) (Andersen ,2006) are reaching to critical mass, and we are witnessing an explosion in the use of wireless Internet appliances, including Internet-ready mobile phones and Personal Digital Assistants (PDAs). While citizens' access to government information and services are driving force for developing new applications and enhancing existing applications; handheld devices and wireless access can enhance the work performance of government workers to give better services to citizens/clients (Nava, 2005).

Martial and Methods

To achieve this work some material and methods were used and included S/W and H/W sides, in H/W side the materials included:

Specific mobile device (3G or LTE) was used to access application and web services

Private local network (intranet) was designed.

In S/W were some methods and application are designed and developed as follow:

Many E-services and applications were designed and developed that undertaken e-gov.

The environment of Zope server was used.

Plone and python language were used.

LDAP scheme was designed based on Linux Debian.

The WiMax technology as media was base.

S/W and H/W interactive interfaces were designed and used.

The framework of open source operating system was based.

By using the above material and methods we provide the ability to access the applications and services that were available in local servers that will agree with "ANY TIME ANY WHERE", so the added value of our work to support people which are live courtyard (rural and remote areas) . at fwrthermore in the practical side we design a prototype of Mportal and MSC (mobile switching center) to prove our concept.

Implementation Techniques of Mobile Government

According to Lu Jinjun, Shao Xijun. (Andersen, 2008), technologies that support the implementation of m-

government can be mainly classified into four groups:

Those based on wireless two-way radio-communication or broadcast;

Mobile voice services, SMS, WAP, GPRS, UMTS based on cellular phones;

Those based on mobile devices, including lap-tops, flat computers, PDA, pager, blue-tooth technology, RFID and GPS;

Those based on network Wi-Fi or WAPI wireless local area network (WLAN).

M-Government Features

The followings were some of the attractive features that prompt shift towards m-Government: in developing countries (Nkosi, 2010)

Number of mobile users and increasing penetration: more people than ever have ownership of mobile devices capable of accessing e-services and e-contents.

Mobiles connecting people to the Internet: In Ghana, urban users were using mobiles to receive an "Internet experience" through Wireless Application Protocol (WAP) services provided over General Packet Radio Service (GPRS).

Mobility: enables people to access content wherever they were.

Inclusiveness and Remote area

access: Mobile phones, can reach those areas where the infrastructure necessary for Internet services or wired phone services is difficult to setup. In the developing countries mobile government applications may become a key method for reaching citizens in far and wide areas and promoting exchange of communications.

Low Cost: mobile phones were a relatively low cost technology, which the common people can afford to have it as compared to Internet technology.

Ease of Learning: Usage of mobile devices was fairly simple thus making it easy for any common person to use it and to access information.

Easy Infrastructure Setup: Due to the simple architecture of mobile telephony, new mobile phone networks can be easily installed in countries where infrastructure was an issue and less economic constraint.

Improvement on e-Government effort: M-government was not a replacement to e-Government but complementary to it. Also, it helps in expanding the scope of e-Governance in the areas like e- Democracy, e- Participation, e-Voting and many other forms of communication between the citizen and the government (Coursey, 2008).

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M-Government Services

As stated m-Government exists to apply for four main dimensions in the public sector as illustrated in below (Andersen, 2006).

M-Communication: Providing information to the public was not a trivial activity. It was the foundation of citizen empowerment. Without relevant information citizens were unable to form intelligent opinions and, thereby, were unable to act on the issues before them meaningfully

M-Services: Providing a channel of communication between citizens and government via SMS, and enable G2C transactions as well. Some examples of existing m-Services include m-Parking, m-Teacher: m-library and crisis communication.

m-Democracy: m-Voting and the use of SMS and mobile devices for citizen input to political decision making is an m-Government application with tremendous potential to enhance democratic participation.

M-Administration

Integration E-Government and M-Government

E-government services and technologies have a rapid growth. Utilizing the innovative ITs, especially web-based applications, used to improve the basic and primary activity of governments and extending the related activities to the e-government. Nowadays, the process of development the mobile technologies and seamless technologies have created a new direction in e-government which called m-government (Coursey, 2008). Although e-government is transit to m-government, m-government is in its first stage of implementation and it has implemented completely in nowhere. Different factors such as technical infrastructure, information infrastructure, mobile telephone penetration rate, social conditions, security situations, and political decisions should be considered for transition from e-government to m-government (Garcia, 2005). M-government can be an enabler for e-government to simplify the service delivery to citizens through different tools. Also m-government is the use of mobile and wireless communication technology in government for service and information delivery to citizens and organizations; e-government service improvement is the goal of the m-government (Nava, 2005). E-government and m-government are not

two separated subjects, but m-government is a better choice for general information and services presentation to the citizens because in m-government, accessing to the information and services in any time and any place is possible through connected wireless tools to the internet (Coursey, 2008).

The cooperation of m-government and e-government is important especially for countries that have not heavy investment on e-government implementation. Nowadays, m-government is unavoidable. Influence of wireless tools and wireless network enable the developing countries to activate the employees of governments more through preparing the real time and up to date information. In addition, m-government increases the interaction of citizens with governments. Newfound services as location-based services, services that are related to the location of users, are motivation for m-government which increase the value added of presented services (Alijerman, 2010).

Results and Discussion

There is not a comprehensive methodology for m-government implementation. It is obvious that it is better to present some services of government through e-government infrastructure, but the presented methodology in this paper is adequate for services that are designed for government to citizen (G2C) relations for delivering the public services. So no well-defined methodologies available on how to implement government services to the different parties from present e-Government facility to future m-Government one. This methodology will be used to implement the delivery of services to citizens. This methodology, with little modifications placed in the different steps, can be applied for the

delivery of services to other parties like businesses, etc.

Mobile E-Government Services

The Term m-service extends the concept of web services to the wireless environment. It refers to requesting and running web services on wireless devices.

An application component is considered as an *m-service* if it is transportable through wireless networks; flexible in terms of composition with other m-services; adaptable according to wireless devices' computing characteristics; and accessible by wireless devices via a micro browser as a mobile web application or able to interact with a mobile client software component that consumes web services. As shown in the Fig. (1).

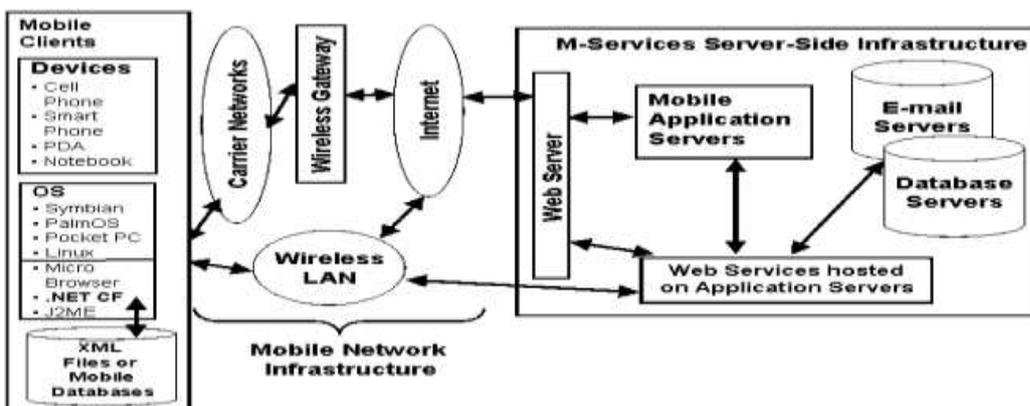
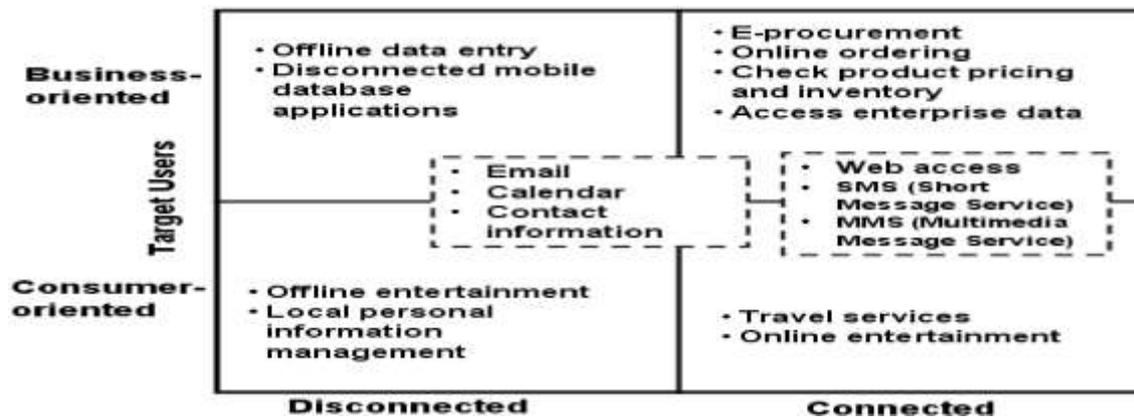


Fig. (1) Show layout of mobile network of E-Govnet

Classification of M-service

M-services include services that can be consumed in either connected or disconnected mode by consumers or business applications. Fig. (2) presents a matrix that classifies *m-services* two dimensions: target users (consumers vs. business) and network connection (disconnected vs. connected).



Disconnected applications can run in an offline mode. Data entered in the offline mode will be transferred and synchronized with the centrally stored data when mobile devices are connected to the network later on. E-mail service, calendar function, and contact information management serve as basic building blocks to *m-services* from all four quadrants in Fig. (2). For example, e-mail is an essential function in a mobile environment because it is often used in the context of business workflows in support of mission-critical enterprise applications. Web access, SMS, and MMS are basic services that

help deliver other value-added *m-services* in the connected mode. Business-oriented *m-services* in the connected mode include e-procurement, online price checking, ordering, shipping status tracking, and so on. These *m-services* can be used to integrate mobile applications with legacy systems or ERP systems.

Fig.(2) A classification of m-service

MPORTAL Gateway to Applications and services

The term *portal* was used to refer to well-known Internet search and navigation sites that provided a starting point for web consumers to explore and access information on the World Wide Web. The original portals were search engines. The initial value proposition was to offer a full text index of document content and a chance to take advantage of the hyper linking capabilities built into the web protocols.

Proof of concept (GovNet Network)

Government network (GovNet) is a part of E-government project which is deal with government employees and Government information , which is consist of Datacenter and network infrastructure (WiMAX)(*intranet network with controlling access to internet*) .The GovNet supports Government sector by exchange information (G2G). Layout infrastructure. As show in Fig. (3)

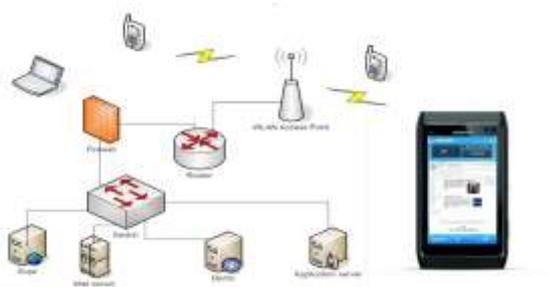


Fig. (3) Block Diagram of Mobile GovNet

Architecture of M-Service Portal

A web portal is an aggregation of heterogeneous web resources at a website to provide easy access to these resources. We propose an *m-service* portal architecture, as shown in Fig. (4), which integrates *m-services* to provide adaptive and personalized services and to accommodate the constraints of mobile devices.

An *m-service* portal can be either consumer-oriented or business-oriented. The architecture of the proposed *m service* portal consists of three major components:

List manager maintains a personalized list of pre-configured *m-services* (e.g., frequently-used hyperlinks to various *m-services*) specified by mobile users.

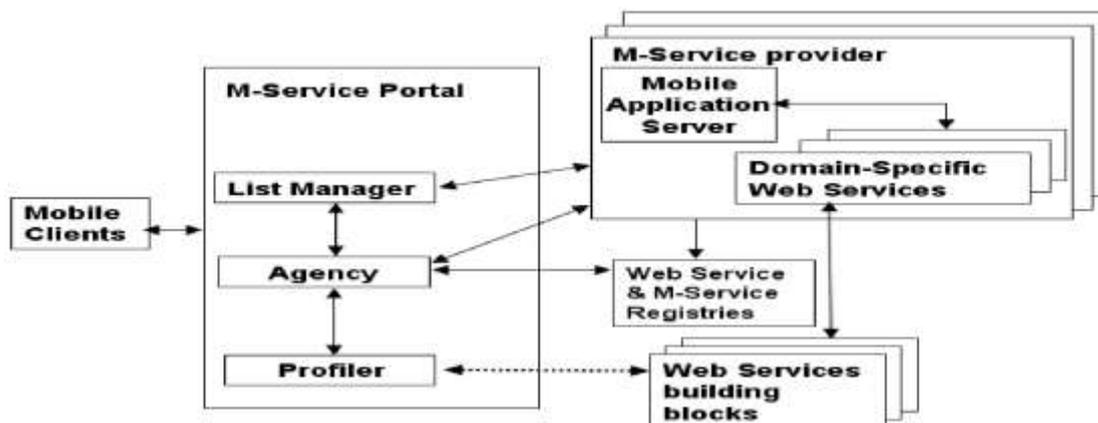


Fig.(4) An M-service portal Architecture

The list can be updated based on mobile users' access patterns by assigning higher scores to the most recently visited sites. It aims to reduce unnecessary data entry and search. The user can also use the List Manager to link to other m-service portals such as:

- Google Wireless Web Search. It allows users to search not only the 'Mobile web' created specifically for mobile devices, but also the entire World Wide Web.

- MSN Mobile. It provides mobile internet services similar to MSN services to users of mobile devices. Those services include e-mail, weather information, sports, news, personalized MSN alerts, as well as MSN Messenger.

Profiler is responsible for storing personal information and preferences such as financial profiles, health and insurance profiles, information needs (such as scores of sports games and local weather), message delivery preference for consumer-oriented m-services, and properties of mobile devices that users have (for customized content presentation). Business rules can be integrated into business-oriented

m-services such as e-procurement.

The management of profiles and preferences can be implemented using web services built upon external web service building blocks, so that the profiles and preferences can be easily shared with other m-service applications outside this m-service portal.

Agency uses intelligent agent technologies to reduce unnecessary interaction between m-services and the mobile user. Based on users' information recorded in the Profiler, agents can proactively collect relevant services and information on behalf of users.

Mportal of GovNet

The suggested Mportal of GovNet that can access by mobile device to connections to local and wide area government networks, and, public and private partnerships to extend Internet access in rural and remote areas. Mportal 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 units Fig.(5) and Fig.(6) show Mportal of GovNet M-service list



Fig. (5) MPortal Govnet M-service



Fig. (6) Horde Email

Suggested M-Government

In the following steps we explain the interactivity between the mobile device (used by customer) and the *Mportal* to access the m-services those are available on the special intranet.

Step 1 : select the required mobile device to access the intranet(Nokia or Samsung) or any device can be used to interactive with wireless that have features of Wimax, Wi-Fi technology as shown in Fig.(7).



Fig. (7) Main Interface of Mobile Device

Step 2: now connect to access point by determine a specific Network (Govnet).

The specific network select here is hotspot (dig-soc) as shown in Fig. (8).



Fig. (8) Access Point Page

Step 3: The connection between the mobile device and the special local host network was established as shown in Fig. (9).



Fig.(9) show login menu

Step 4: Determine the login to the selected network, where the security level is depending on the login and password as shown in Fig. (10).



Fig.(10) Entering Authorization Information

Step 5: In this step there are two facilities to accesses the network services, the first through the specific intranet (m-service or our m-portal) the second through wide web world (internet) where the customer can be accessed the available resources, as explained in the Fig (11). Now the customer can be accessed and used the available m-services (horde mail, human resource application etc.) as explained in the Fig. (12).



Fig.(11) access to internet



**Fig. (12) a. Access to mPortal
b. Access to application**

Suggestions and Recommendations

Mobile e-government is an important information channel to improve efficiency of urban government and social administrative functions, raise its capacity to serve the public and strengthen government's emergency handling ability. In order to enable mobile e-government to give strong support for governmental work, we give the following recommendations for the construction and development of mobile e-government system.

Establish mobile e-government laws and regulations. Improve laws and regulations concerning mobile e-government construction as soon as possible, so that standards of public services can be raised.

Carefully accomplish the overall planning and top-storey design of mobile e-government.

In its development, mobile e-government should not abandon the achievements of constructing original governmental information and e-government. Viewed from the growing trend of mobile e-government research, the following problems are worth discussion and research:

Restructuring of governmental services. How we can provide a good environment for the development of mobile e-government through clarification, definition and allocation of services of government departments.

Recreation of governmental processes. In the promotion process of mobile e-government, information technology is the basic method and tool in reconstructing governmental processes.

Resource pooling. First, resource sharing among various functional departments at the same level; second, resource sharing among governments at different levels; third, resource sharing between national power bodies and functional departments of the government; fourth, resource sharing between the government and the public of enterprises.

Service model of the government. A kind of small-scale new governmental organizational form with definite functions and boundaries can be ultimately realized through service restructuring, process recreation and resources pooling. Construction of mobile e-government is a gradual and long-term process, and the government should learn from experiences and lessons of other cities and developed countries and make full use of mobile communication technology to create a highly efficient, citizen-centered and service-oriented government.

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