

CITIZEN CENTERED MODELS USING MOBILE TECHNOLOGY APPLICATIONS FOR M-GOVERNMENT

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Abstract. This research paper will present an existing application and the opportunity m-government services base on mobile technology applications. First we examine the existing applications in mobile technology that can be used for m-government services around world. Secondly, we will look at the benefit and disadvantages those mobile technology applications for m-government services. In addition, it will provide an overview the development of ICT in Indonesia and recognizing the particular challenges that exist for e-government in Indonesia. Then, we will create an analysis as the citizen centered models for m-government base on smart phone mobile technology application.

Keywords: e-government, ICT, m-government, , smart phone mobile.

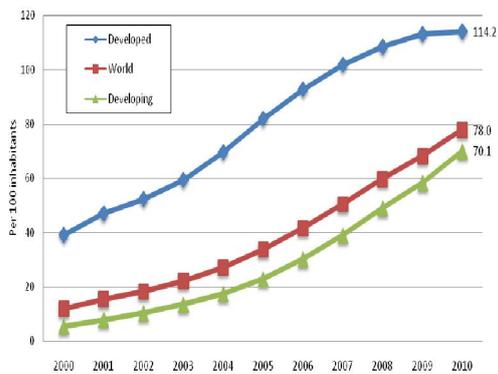
1. INTRODUCTION

Recently, this is a zenith stage for technological revolution presenting technological success for advanced country to implemented e-government service for citizen and business. While the developing and third country find them self trapped in the vicious cycle of penetrate the suitable ICT for delivery e-government, we believe with the advance ICT technology especially using mobile technology application, it is a right time to use ICT platform for increase citizen access and government service for better service to citizen either in urban or rural area.

Citizen or people are mobility than before, its impact on the need of mobile technology. Mobile technology is not only for receive and call telephone or send and receiving short messages. Currently, mobile technology it can be used for internet's explorer, open and send email, location detection, join social network, television and etc. Those technologies are known as smart phone. User behavior on mobile technology application or smart phone, it also changes the way of e-government service and supporting daily life. Snellen and Thaens (2007), mention that using Internet for e- government is

limiting the use of services. However, with the advantages mobile technology and internet broadband, e-government services using mobile technology application is transform the way of e-government services through internet. With mobile technology application and smart phones we can accessing web service, web mapping, email, social network, text messages, which known as short text messages (SMS). [8], [9] defined m-government as a strategy and an implementation that involving the utilization of wireless and mobile technology. It is include services, applications and devices for improving benefits in e-government.

Several fact why people more favoured using m- Government. Firstly, as related to the facility that people have. The fact is that there are more people who could afford to have cell phone or other wireless device as compared to have access to PCs. It also supported with data from ITU that show the user of cell phones is increased rapidly. It can be seen from Figure 1:

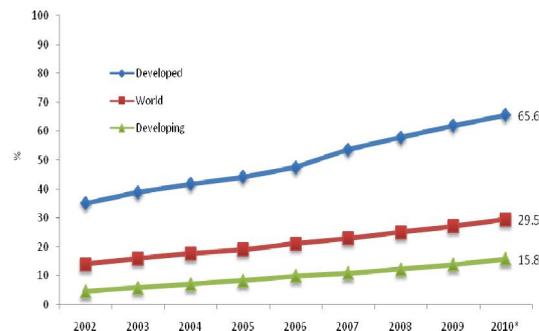


The developed/developing country classifications are based on the UN M49, see: <http://www.itu.int/ITU-D/ict/definitions/regions/index.html>
Source: ITU World Telecommunication /ICT Indicators database

Figure1. Mobile Cellular subscription per 100 inhabitants, 2000-2010(ITU, 2010)

Second reason is computers generally do not travel with citizens, but information and public services can. M-government provides for instant availability of services and information, helping frequent travellers and people on the move to access government. Thirdly, those mobile technologies allow by passing building all the heavy infrastructures, the costs and time association with developing those infrastructures and adopt wireless or mobile technologies. There are no such barriers to access information from the government as in case of e-government where lack of technical infrastructure and low level of citizen's readiness becomes a barrier [1]

It can be assumption that the way people accessing information with internet access is increasing although it not as faster as the increasing of mobile cellular increasing.



*Estimates
The developed/developing country classifications are based on the UN M49, see: <http://www.itu.int/ITU-D/ict/definitions/regions/index.html>
Source: ITU World Telecommunication /ICT Indicators database

Figure 2. Proportion of households with internet access by level of Development, 2000-2010 (ITU, 2010)

This research paper will present an existing application and possible model m-government services base on mobile technology applications. First we look at the benefit and disadvantages of m-government. Secondly, we examine the existing applications in mobile technology that can be used for m-government services around world. Thirdly, we will create a frame work of analysis as the citizen centered models for m-government base on mobile technology application.

2. BENEFIT AND CHALLENGES FOR USING M-GOVERNMENT

2.1 Benefit for using M-Government

Mobile device is always on the modern society. People tend to be bringing their mobile devices. In addition, they regularly consult the screens of these devices to see whether new or interesting information is received, or whether contact is sought by relevant, or interesting, people outside the meeting. [10], [11] noted a few benefit using m-government, such as:

- a. Increasing the productivity of public service personnel.

M-government allows public servants to enter data into digital systems exactly where they are in the field. Not only does this move data-gathering closer to real-time operations, it also reduces the time public servants spend on data activities, thus releasing more of their time for value-added, service-related activities. For example, where previously reports would be noted on paper in the field and then retyped back at base, they can now be entered direct, not only removing duplication of effort but also reducing the number of data errors. It also supported by Banerjee and Chau (2004), who describe a few benefit using mobile technologies from the government point of view using Firstly, it is by using mobile technologies cover the way to deliver information. The information is quicker and up-to-date to citizen. In addition, government can fulfill the citizen's demand for better government services and as far as the developed nations are concerned, they are already benefiting from their existing wired infrastructure and mobile. Wireless technologies provide them wider opportunities to reach their citizens.

- b. Increasing the effectiveness of public service personnel

Public servants in the field currently have to make do with the data they carry around with them – in their heads or in portable files. With m-government, they can take the whole of digitized government with them into the field, allowing them to make much better-informed decisions and actions.

- c. Improving the delivery of government information and services.

M-government can deliver data and services whenever and wherever the citizen is. This has a benefit to citizens. They can get immediate access to whatever they want no matter where they are. It also has a benefit to governments. For example in sending terror alerts or

other very time-sensitive information, m-government provides the greatest chance of getting through quickly and directly. In addition, [1] defined the benefit from citizen perspective, mobile government stands for new front-end access to public services that have been made available specifically for mobile devices or adapted from existing e-government applications. More and more, governments are using handheld and wireless devices to provide more access to public data, enable employees to communicate with each other, and give public servants, such as building inspectors and police officers, another tool to do their jobs more efficiently.

- d. Increasing channels for public interactions

M-government (where not used to substitute for other channels) provides an additional channel for interactions all stakeholders in governance – service deliverers, policy makers, service consumers, civil society representatives. This provides greater choice.

- e. lower costs leading to higher participation

The hope in relation to the good governance process, by reducing time and effort of communication, m-government will encourage more communication for the citizen, from e-voting, to contributions to political debates, to complaints or queries.

2.2 Challenges

Gold stuck (2003) noted it is not everyone has a mobile device. In particular, older and poorer groups in society tend to be excluded from this technology. In addition, some people only want to use mobile phones for voice and personal text messages. [10], [11] describe few challenges for implementing m-Government:

- a. Cost

M-government tends to be yet one further channel for e-government, in which case it will create additional costs. This will

continue until m-government can truly

b. Data overload

Mobile devices increase the pressures of a world in which users are permanently connected. These permanent connections increase the number of messages circulating and can create a confusion of communications in some valuable, in which public service communications can come to be devalued or lost.

3. EXAMPLES OF M-GOVERNMENT INFORMATION AND COMMUNICATION SERVICES

M-government service that can be access by mobile phone technologies is using web

substitute for other delivery channels.

c. Security

If m-government is to encompass m-payment systems or other transactional public services, then it must have good security and must be trusted. As yet, there is still a credibility gap to be crossed for many mobile device users.

service, email or SMS. Best practices from other countries are that mobile technology application as e-government (G2C or G2C) services can be seen as table below:

Table 1. G2C and C2G product using mobile technology application in other countries

Mobile Technology	Applications	Country	Descriptions
Web Services	The wireless portal of the government of Canada: provides airport info and passport services.	Canada	Enable citizen to access airport services from mobile phones
Web mapping	Emergency management : Fire and Natural Disaster	USA	Enabled emergency officers to identify the direction of the fire and the location of nearby structures.
	Crime information report	Netherland	Provide information crime area in Holland base on victim report.
	Merapi Eruption	Indonesia	Allow eruption victim to inform public which is danger zone of Merapi eruption.
	Public transport route (Bus, Train)	Australia	Allow user public transport system to create trip planner using public transport
	Mobile Parking fee payment	Austria	Allow citizens to pay parking fee through mobile devices

4. DEVELOPMENT		Sale ticket for public transport	Finland (Helsinki's public transport system)	Allow citizens to buy public transport ticket using mobile phones
	SMS	Higher participation from the citizens	China	Allow citizens to have speak freedom to the government
		SMS elections	Hungarian	To vote via SMS for parliamentary elections
		Education Initiative	Malta	Provide exam results

OF ICT IN INDONESIA

4.1 Internet

Indonesia connected to the global internet in 1994. The first link in Indonesia was a 64 Kbps line to the US, opened in May 1994 by the Indonesian Science and technology network [8], [9]. In 2006, however, the level of public access to the Internet remains highly variable. The proportion of the population accessing the Internet from home is only 12 percent, from Internet kiosks around 43 percent, campuses 3 percent, school only 1 percent, and offices 41 percent [4]. It seems that the majority of Indonesia's citizens are either using public access facilities such as Internet kiosks to access the Internet, or doing so through work where this is possible for them.

The number of Internet users in Indonesia by May 2007 was estimated at 20 million. This represents a low penetration for the Internet in Indonesia [7]. Broadband Internet access, although certainly on the increase, was still in the very early stages of development, with only one broadband service per 1000 population by the end of 2006. The government continues to promote wider use of online services, but there is much work to be done in this regard.

4.2 Fixed Line / Dialup

According to BPPT [4], telecommunication penetration in Indonesia is 4 percent in fixed line, fixed

wireless 2.6 percent, cellular mobile 28.6 percent, Internet 11.4 percent and broadband Internet 0.2 percent in 2006. The fixed-line phone service has a low density of only 6 percent or 6 phone lines per 100 people and the majority of fixed phone lines are concentrated in cities. Consequently, those who live in villages and rural areas do not have the opportunity of using fixed line facilities. It is also noted that the growth of the telephone fixed line network has remained constant since 2006.

4.3 Mobile phone networks

Indonesia is the fastest-growing mobile-telephone market in the Asia-Pacific region, with its 2002 market share exceeding 25 percent and 2003 growth projected to be twice as high with a market share exceeding 40 percent. BPPT (2007) [4] also noted that the mobile penetration in Indonesia is growing significantly at almost 60 percent per year. Though Indonesia has the lowest per capita ratio of cellular subscribers among Southeast Asian countries, the numbers and the potential users are a major attraction for investors.

Cellular service was virtually non-existent in 1998, used by only 0.5 percent of the population, with usage concentrated in Jakarta. With the bad economic conditions brought on by the 1997 financial crisis, the primary barrier to entry then was the cost of the handset, ranging from \$225 to \$1,100. However, this has changed dramatically in more recent times.

The number of mobile users has grown at double-digit rates during the past few years, and by the end of last year had reached almost 12 million users, up from 6.57 million the year before, and well up on the projected 8 million for 2002 [6].

The reason for the dramatic growth of mobile phone use by Indonesia's citizens is that accessing mobile phone services is easier than using fixed lines. This encourages the public to turn to the use of the mobile phone rather than fixed line services.

As the country with the fifth largest population in the world, Indonesia is a massive potential market for mobile technology adoption and development. Despite an annual per capita income of only \$1,280 USD, there are 63 million mobile phone users in Indonesia and it is predicted to reach 80 million in 2007 [7].

Due to the use of GSM technology, SMS has become used widely by the Indonesian public, from teenagers to business people for their personal needs, and by people in their business activities, since the technology was introduced in 1998. As a result the sending of SMS messages via mobile phones is a part of many people's daily routine and so it could become an effective and efficient means for transactions within government services in the future

5. IMPLEMENTATION STRATEGY FOR INDONESIAN E-GOVERNMENT SERVICES

Based on the current state of ICT infrastructure in Indonesia the best way to implement e-government in Indonesia is by using SMS for e-government services.

The reasons are:

SMS is cheaper than internet

Since the mobile phone was introduced in Indonesia, the use of the SMS facility has boomed across all user groups. Sending an SMS from a mobile phone is very cheap and is sometimes free.

Compared with using the Internet, SMS is cheaper because having an Internet facility is more expensive for Indonesians who have, in comparative terms, a generally low income.

The mobile phone network has a greater coverage of Indonesia compared to fixed line and internet networks.

Mobile phone ranges cover almost the whole of Indonesia and market penetration has moved quickly to almost 30 percent, while during the same time the fixed line network has grown at a constant rate [BPPT]. It is possible to hypothesize that competition in mobile networks in Indonesia since 2005 has increased and that this extra competition has helped the development of the mobile phone network to grow very fast. Moreover, Indonesia is a country with many islands, and much of its area is still rain forest, mountains and dozens of rivers. These factors lead to many difficulties in building a fixed telephone line in rural villages and remote areas, and this slow development in the fixed infrastructures feeds into the natural advantages enjoyed by the mobile network. Because the mobile network can overcome many of the challenges of remoteness and isolation, SMS is by far the cheapest and easiest means for people in remote areas and villages to access e-government services and it can therefore increase the participation of the Indonesian public in government activity.

There are no barriers such as lack of IT skill and English proficiency

Indonesian people generally have low levels of IT skills and English proficiency. These low skill levels could be a major barrier for Indonesian people in seeking e-government information through the Internet. By using SMS, Indonesian people do not need to have IT skills and English proficiency. Indonesian languages or Bahasa use the same alphabet as in English, therefore the standard handsets as

used in developed countries are instantly useable.

SMS only requires the use of 2G mobile phone applications

The price of a 2G mobile phone is much cheaper than a smartphone, PDA or 3G mobile phone. Consequently basing e-government in Indonesia on text messaging services will enable access for those with low incomes.

3G network and services have made a slow start in Indonesia

Coming into 2007, five mobile operators in Indonesia were offering 3G services, having launched networks in 2006. However, only one operator (Telkomsel) was making a strong impression on the market (2 million 3G subscribers by March 2007) [7]. The other operators had generally got off to a slow start. 3G services seem exclusive and expensive because there is only one operator who provides the service, and this is limiting the spread of the more up-to-date facilities.

6. ANALYSIS OF M-GOVERNMENT MODEL BASE ON MOBILE TECHNOLOGY APPLICATIONS

Base on smart phone application, the business models m-government can be categorized as below:

a. Information models

It can be explained, where the citizen is easy to occur the information from mobile technology application, by using mini web browser from mobile devices or sending text messages. For example accessing e-government web, seek for information through web mapping or pull information by using SMS.

b. Communication models

It can be defined as a communication between citizen and government. The communication it can be happen, it is by using mobile devices technology

such as telephone, SMS, chat messenger or and social network.

c. Transaction models: doing business it can be used

It can be said that using mobile technology application citizen can do a transaction such as to pay parking ticket or pay taxes with special code.

d. M-democracy and participation: G2C and C2G

It can be seen that using mobile technology can increase the participation between government and citizen.

7. CONCLUSION

M-government is not a replacement for e-government, rather it complements it. While mobile devices are excellent access devices, most of them, particularly mobile phones, are not suitable for the transmission of complex and voluminous information. Despite the emergence of more sophisticated handsets, mobile phones do not have the same amount of features and services as PC-based internet applications.

The solution for the Indonesia government in providing e-government services that can be implemented in the shortest time is by using SMS text messaging as the basis for e-government services. This would stimulate e-government services in Indonesia.

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