## *AN EVALUATION OF MOBILE-GOVERNMENT WEBSITES IN INDONESIA*

## EVALUASI SITUS WEB PEMERINTAH BERBASIS MOBILE DI INDONESIA

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#### *Abstract*

*This research evaluates 20 mobile-government websites in Indonesia based on the evaluation framework consists of four aspects, namely General Characteristics, E-Content, E-Services and E-Participation. Based on the evaluation result, all the mobile-government websites focus on e-content and e-participation. The content here is updated regularly especially about news and information, however the low e-services scores provide evidence that the content and e-participation provided are one-way communication method only. Mobile-government implementation in Indonesia seems still in the first stage of e-government development model. Most of the mobile webs are only informational. It is suggested to improve and develop further to reach the transactional level where all the services are integrate*d.

*Keywords:* m-government, e-government, website evaluation, mobile website evaluation, Indonesia

#### Abstrak

Penelitian ini mengevaluasi 20 situs web pemerintah berbasis mobile di Indonesia berdasarkan kerangka kerja evaluasi yang terdiri dari empat aspek, yaitu Karakteristik Umum, Konten Elektronik, Layanan Elektronik, dan Partisipasi Elektronik. Dari hasil evaluasi, diketahui bahwa situs web pemerintah berbasis mobile fokus pada konten elektronik dan partisipasi elektronik. Konten sudah diperbarui secara reguler khususnya tentang berita dan informasi, bagaimanapun nilai layanan elektronik rendah menyediakan bukti bahwa konten dan partisipasi elektronik hanyak bersifat komunikasi satu arah. Implementasi pemerintahan mobile di Indonesia sepertinya masih berada di tahap pertama. Kebanyakan juga hanya bersifat memberikan informasi saja. Direkomendasikan untuk meningkatkan dan mengembangkan lebih lanjut untuk mencapai tingkat transaksi di mana semua layanan sudah terintegrasi.

**Kata-kata kunci:** pemerintahan elektronik, pemerintahan mobile, evaluasi situs web, evaluasi situs web mobile, Indonesia

## INTRODUCTION

### Background of Research

In today's digital age of technology, the internet has been used within many industries and sectors as to support the conveyance of information and service. Viewed as a powerful tool to enhance and advance information and service, governments too are not left behind within the utilization of such means (Me, 2002). Moreover governments around the world, as with other sectors in the economy, have further embraced the global trend of mobile internet browsing through the adoption and implementation of mobile portals. Apparent through the implementation of mobile-government (M-government), Nava & Dávila (2005) asserts on the concept of m-government as an extension of e-government. Albeit that both m-government and e-government essentially provide for the same service, M-government should be considered as complimentary tool to e-government, which has more options of device compatibility and media integration (Kuscu, Kushchu and Ye, 2007). Practices can vary such as that including text messaging (SMS), apps or widgets and mobile websites (Misra, 2010). Although relatively limited in comparison to e-government, Trimi and Sheng (2008) argue that m-government are important as a future element within any government. Moreover, such attempts have the intentions of lessening the digital divide that commonly exists in developing and less-developed countries (Me, 2002). Categorized as a developing country, Indonesia consists of thousands of islands (70% of the area is ocean). That geographical condition has given much difficulties concerning ICT, including the delivery and spreading of government information and services. The ICT divide (or digital divide) presently is still an issue of concern that the Indonesian government must solve. With regards to Indonesia's mobile internet sector, mobile internet usage has experienced an explosive growth since 2008. According to Media Buzz (2010), Indonesia has experienced a 48% growth rate in 2010 alone, the highest and fastest growing number in comparison to other Southeast Asian nations. In recognition of mobile penetration beating telecommunications penetration, it can therefore be seen as beneficial for all parties if such attempts of improvement are made (Spire Research and Consulting, 2009).

With initial development starting in 2001, presently Indonesia has almost 500 e-government websites (E-Local Government Help Desk, 2010). Anticipating the mobile phone and internet boom in Indonesia, m-government development concentrations has been pioneered by several governmental agencies. This effort is done in order to optimise the use of ICT in solving the difficulties concerning geographical condition and the ICT divide. Although these has been no literature which to provide for an exact number of Indonesian mobile-government websites, almost 30 mobile webs are identified in this research.

Mobile-government is relatively a new implementation in the area of Information and Communication Technology. Despite the numerous publications of mobile-government research available, such research is still consider a lack there of within the practice and implementation of such means. As a new concept of government services, many areas of concern arise. Of such concern include the application of general research into a more specific implemented role within Indonesia. However, a crucially important research which has surfaced is the evaluation of mobile government websites. With regards to the difficulty of mobile website and system design, evaluation therefore plays a key role in assessing if such attempts of governmental support is achieved (Nielsen, 2009). Apart from technical and infrastructure concerns, the mobile website design and content also plays an important part in encouraging people to interact with main websites. As a result of the importance, this research proposes an evaluation of Indonesian mobile-government websites. By using combination of the frameworks proposed in Panopoulou, Tambouris and Tarabanis (2008), 20 Indonesia mobile-government websites will be evaluated.

### Research Question, Aim and Objectives

This research will mainly focus on the evaluation of 20 mobile government websites in Indonesia. Based on the research background mentioned above, some questions have arisen concerning the evaluation of mobile-government website owned by the government of Indonesia. Those questions are concise into one big question:

*"How is the implementation of mobile-government in Indonesia based on the website evaluation perspectives?" The aim of this research is to assess the mobile government implementation in Indonesia by evaluating the mobile websites.*

The objectives are:
1. To see how far the implementation of mobile-government in Indonesia based on the stage model of e-government development.
2. To assess the mobile-government websites in Indonesia by utilising the framework proposed by Panopoulou, Tambouris and Tarabanis (2008).

This research assesses to what extent the mobile-government websites in Indonesia has been implemented. The assessment will be conducted by utilizing the framework proposed by Panopoulou, Tambouris, and Tarabanis (2008).

The evaluation framework proposed by Panopoulou, Tambouris, and Tarabanis (2008) provides a brief scheme in evaluating e-government websites in terms of general characteristics, content, services and participation. Although that specific research mainly focuses on e-government websites, it is possible to apply the evaluation framework on mobile-government websites. This is with regards to Georgiadis and Stiakakis (2010) who contend that e-government website evaluation frameworks, models and methods can be applied to mobile-government as long as modification are conducted to suit the characteristics of mobile webs.

### Critical Review Of The Literature

*Introduction*

Many scholars briefly say e-government and mobile-government are viewed as the best practices for delivering information and services to citizens effectively

and efficiently (Misra (2010); Sandy & MacMillan (2005); Kuscu, Kushchu & Yu (2007) among others).

*M-Government Concept*

Mobile-Government is defined as the implementation of e-government using wireless infrastructure and devices (Turban *et al.*, 2010). It can be accessed by any mobile devices such as mobile phones, smart phones, and wireless devices. It is assumed as an improvement of E-Government since it is believed to be the right solution for developing countries concerning about government services (Ghyasi and Kushchu, 2004) and the digital divide (Me, 2002). It runs well in developed countries and it is expected to yield the same result for developing countries as well.

Mobile-government is not different from e-government. Misra (2010) regards it as an integral part of e-government, while Ishmatova and Obi (2009), and Ghyasi and Kuschu (2004) classify it as an extension of e-government. It is never meant to be e-government replacement but it is e-government complement (Sandy and McMillan, 2005).

*Why M-Government is better than E-Government?*

In several developing countries, e-government turns out to be fail projects (Dada, 2006). Poor IT infrastructure and economic are accused as the main problems. Ghyashi and Kushchu (2004) think that this is also because of low level education and discrepancy income. Meanwhile, Dada stresses the gaps between the e-government design and the reality as the real problem, although the infrastructure is available but the inability to access ICT has become more dominant factor. Ambali and Hashim (2007) add it by stating some are unable to access because of their locations.

Based on those failures, Nava and Davilla (2005) claim that mobile-government can be a better way in providing services to citizens compared to any conventional e-government. This claim is supported by Ghyashi and Kushchu (2004) especially by looking at the flexibility of mobile devices (anywhere, anytime and anything).

Mobile-government predominance starts from the device used for accessing mobile-government services. It is commonly addressed to mobile phones. Mobile phones are inexpensive compared to other internet devices. It is easy to use a mobile phone and it has been widely considered as one of the important things for people to have.

In some countries, using mobile phones is easy since people only need to buy the mobile phone and the SIM card (Ghyasi and Kushchu, 2004). They do not have to register or set up monthly pay, they just have to buy it and activate it directly. This easiness has made mobile phone penetration all over the world, commonly, exceeded penetration of any other communication devices.

Another thing to be considered is mobile-government can remove the limitations of time and place since most people let their mobile phones switched on and they make sure that their mobile phones are always with them. This is stated by Nava and Davilla (2005) as the main factor of e-government failure; most people take their mobile phones everywhere not their computers. There are also more people who have mobile phones than computers.

*M-Government implementation in Indonesia*

Indonesia as a developing country has started to construct e-government service. Some local governments have also initiated to construct their e-local government. This is a follow up from President Instruction No. 3/2003 (The policy and strategy of E-Government Development in Indonesia). There are six strategic steps to develop e-government in Indonesia. The main point of the strategic steps is to develop e-government by involving all government stakeholders. In 2003, most e-government websites in Indonesia just ran information function through websites and only few which has administration functions (Bastian, 2003). Nowadays, there are almost 500 e-government websites available and most of them are local government websites (E-Local Government Help Desk, 2010).

Some problems are identified concerning the e-government development in Indonesia, such as telecommunication infrastructure, low penetration of computer and internet. They have contributed to the late development of e-government implementation in Indonesia (Satriya, 2006). The fact that Indonesia is an archipelago country consisting of more than 17 thousand islands and 220 million people as the population make the development of infrastructure is uneasy and high cost. The Indonesian government has put a lot of effort to develop the ICT, however the limited budget prevents the government to move farther.

However, there is another interesting fact about Indonesia. It is about the growth of mobile internet subscriptions. It has grown explosively from 300,000 in June 2008 to almost one million in June 2009 (Spire Research and Consulting, 2009). The growth also happened not only in Jakarta, but in most big cities all over Indonesia (Widiantoro, 2010).

Jakarta still becomes the city with the most internet users; however the highest growth of mobile internet users is Semarang, with many other cities hit remarkable growth level. Noor (2010) believes it is triggered by instant messaging and social network sites. Facebook mobile and instant messaging have encouraged people to use internet from their phones although they have never had browsing internet via desktop computer. Additionally, Indonesia has become an interesting market for Blackberry since the Blackberry booming in 2009 (Shubert, 2009).

The government of Indonesia responds the phenomenon by launching mobile government as one of the improvement ways in providing public information and services. The decision made not only to respond the phenomenon, but also to follow up the e-government policy in Indonesia. In fact, many discussions have been made in order to suggest and explore the mobile-government implementation in Indonesia, such as Nugroho (2008), Dionesa (2010), Sembiring (2006), and Sosiawan (2008).

The first mobile government service launched was SMS-based system. The initiative was started by the city government of Balikpapan in 2006 (Kapanlagi.com, 2006). Then, some government agencies, followed by other local governments, started to implement mobile government practice, whether web-based or non-web-based.

*Mobile-government websites in Indonesia*

M-government implementation has been started by several government bodies. There are 30 m-government websites identified, however only 20 m-government websites that can be access regularly when the research is conducted. Table 1 lists all the websites.

The table consists of 1 state supreme agency, 2 coordinating state ministries, 7 ministries, 3 state commissions/non-dept institutions, 4 province governments and 3 city/regency governments. These mobile webs are active at the time research was conducted. While the others, ten m-government websites were identified active, but at the time research was conducted the mobile webs were not active.

**Table 1.**
**M-government websites in Indonesia**

| No | Government Agencies | URL |
|----|---------------------|-----|
| 1 | House of Representatives | www.dpr.go.id |
| 2 | Coordinating Minister for Human Development and Culture | www.kemenkopmk.go.id |
| 3 | Coordinating Minister for Political, Legal, and Security Affairs | www.polkam.go.id |
| 4 | Ministry of Marine Affairs and Fisheries | kkp.go.id |
| 5 | Ministry of Communications and Information Technology | www.kominfo.go.id |
| 6 | Ministry of Energy and Mineral Resources | www.esdm.go.id |
| 7 | Ministry of Social Affairs | m.kemsos.go.id |
| 8 | Ministry of Health | www.depkes.go.id |
| 9 | Ministry of Religious Affairs | www.kemenag.go.id |
| 10 | Ministry of Transportation | m.dephub.go.id |
| 11 | Corruption Eradication Commission | m.kpk.go.id |
| 12 | Indonesia Investment Coordinating Board | www.bkpm.go.id |
| 13 | National Search and Rescue Agency | www.basarnas.co.id |
| 14 | Province of Jawa Barat | www.jabarprov.go.id |
| 15 | Province of Banten | www.bantenprov.go.id |
| 16 | Province of Jawa Tengah | www.jatengprov.go.id |
| 17 | Province of Jawa Timur | www.jatimprov.go.id |
| 18 | Cilegon City Government | cilegon.go.id |
| 19 | Bandung City Government | portal.bandung.go.id |
| 20 | Banyuwangi Regency | www.banyuwangikab.go.id |

*The adaptation of e-government study for m-government study*

The question, now, is it possible to evaluate mobile web sites which are dedicated to mobile-government by using e-government evaluation framework? The answer is yes. This adaptation is possible since mobile-government is expected to be an integral part of e-government, or as a subset which offers the same services and information with e-government web sites (Misra, 2010). However, Misra (2010) explains further that m-government still needs some action agenda to promote and support the m-government existence.

Georgiadis and Stiakakis (2010) briefly confirms this adaptation way can be applied to any e-government website evaluation frameworks, models and methods as long as the modification is done to suit the characteristics of mobile webs. They also assert that the online sophistication model and e-government stages are suitable to measure the development of m-government as well as the e-government as it used to be. However, a modification is still needed to provide flexibility and functionality for m-government services.

*E-Government Development Stages*

Many discussions have been written on e-government development stages, namely Layne and Lee (2001); Hiller and Bellanger (2001); Koh and Balthazard (1998); Torres, Pina and Acerete (2005); Coursey and Norris (2008); West (2004), and United Nations (2010). Each of them has proposed different models; some of the models outlined have similarities in terms of classification meanings. However, due to the limited space, this review only focuses on four models.

The first model is proposed by Hiller and Bellanger (2001). It is five stages model which consists of information dissemination (catalogue), two-way communication, service and financial transaction, vertical and horizontal integration, and political participation. The first stage is information dissemination, government places information online for the citizens, there is no direct communication except email. Two-way communication, the second stage, is indicated with qualified channel provided by the government to encourage interactive communication between government and its stakeholders. The third stage is service and financial transaction; it is the stage when all the payments and transaction have securely performed online. The fourth stage is vertical and horizontal integration, when the users have reached the stage where the integration of technology required for stage 1, 2 and 3 has taken place. The last stage is political participation. The users (citizens) are able to do online voting in terms of general election or official election.

The second model is the three-ring model proposed by Koh and Balthazard (1998). They divide the e-government development into three different levels of internet application use, namely informational, transactional, and operational. The next model is proposed by West (2004). There are four stages in the model, namely billboard, partial service delivery, one-stop portal and interactive democracy.

United Nations (2010) divides the e-government development into four stages, namely emerging, enhanced, transactional and connected. Emerging stage is the first stage where the government display the information online, any kinds of information such as policies, regulations, and news. The second stage, the enhanced stage, provides two-way communication and governments have started to provide files to download such as forms or letters. Transactional stage is the next stage where online transactions are possible. The following activities, tax payments, renewing driving licences, requesting permit and submitting various application are possible. The last stage is the connected stage. It is the stage when all the services are integrated. The communication between government and the citizens is interactive and the citizens are able to actively participate in decision-making processes.

Those E-government models provide similar division of stages. It starts from the information stage and ends on the integration stage. To summarize the models and identify the similarities, table 2 is provided.

*Mobile website evaluation*

Creating websites nowadays is not as hard as it used to be. However, making people interested in the websites nowadays is not as easy as creating the websites. Nielsen (2000) underlines the tight competition in internet world, people as the internet users are the ones who have full control in deciding websites they want to see. That is why; there is a need to evaluate websites since people nowadays do not want to waste their time on something that they are not able to understand at the first sight.

However, many experts already confirm their optimism on mobile website development, Nielsen (2001) believes mobile devices will be more useful than in early 2000s. Furthermore, Munford (2011) predicts that in 2013, the business of mobile apps and webs is going to be a lot more active than it is today. However, it is considered more difficult, since mobile devices have some limitations, such as small screens, limited keypads, connectivity and customized website design needed.

**Table 2.**
**E-Government Development Stage Models**

| Stage | Hiller and Belanger (2001) | Koh and Balthazard (1998) | West (2004) | UN (2010) |
|---|---|---|---|---|
| 1 | Information Dissemination (Catalogue) | Informa-tional | Billboard | Emerging |
| 2 | Two-way Communication | | Partial Service Delivery | Enhanced |
| 3 | Service and Financial Transaction | Transac-tional | | Transactional |
| 4 | Vertical and Horizontal Integration | Opera-tion Al | One-Stop Portal | Connected |
| 5 | Political Participation | | Interactive Democracy | |

Many frameworks and studies on mobile website evaluation have been conducted. Diaz, Harari and Amadeo (2008) use heuristic evaluation and automatized evaluation to evaluate mobile website, W3C (2008) provides guidelines for creating web content in mobile devices, and Nielsen (2009) considers the evaluation starts from the design that should be prioritized.

These can also be from various approaches, like Chiou, Lin and Perng (2010) showing how website evaluation studies can be made from information system, marketing or combination perspectives.

There are also four criteria proposed in Nielsen (2000) for evaluating websites, they are abbreviated as HOME:
1. High quality content
2 Often updated
3. Minimal download time
4. Ease of use

And after the website fulfils those requirements, three extras RUN should be added:
1. Relevant to users' needs
2. Unique to the online medium
3. Net-centric corporate culture

It makes the abbreviation become HOME RUN as the criteria needed for becoming a good website. This approach can also be utilised on mobile website.

Nielsen (2003) suggests specialized web for mobile services since the mobile web and services should consist: simpler navigation, shorter articles and selective features. The services provided through mobile web should be an extension of main websites. The services should suit with mobility aspect, context and moment. The keys are, of course, design and simplicity.

***The evaluation framework for mobile-government websites***

Some research has been done for proposing evaluation framework for government web sites. Three of them are: Antovski and Gustav (2005), Yao and Peng Zhao (2010), and Panopoulou, Tambouris and Tarabanis (2008). Antovski and Gustav (2005) develop an m-government framework based on its principle-driven, they consists of interoperability, security, openness, flexibility and scalability. Yao and Peng-Zhao (2010) proposes evaluation based on citizen satisfaction. While Panopoulou, Tambouris and Tarabanis (2008) propose an evaluation framework with four criteria, they are general characteristics, e-content, e-services and e-participation. Most researches propose an evaluation framework that combines the general website evaluation and the e-government specialty functions.

Antovski and Gustav (2005) develop an m-government framework based on its principle-driven, the principles consist of interoperability, security, openness, flexibility and scalability. The first is interoperability which means the capability to work well when it is connected to the other connection or network. The second principle is security; it means the requirements for citizens and government to feel safe and secure utilizing this communication channel.

The third is openness. This means the m-government has no limitation upon the services; m-government should be open to all the citizens. The openness includes the operational, standards, and other things. Flexibility is the fourth principle and the last principle is scalability, the system built should consider efficiency and sufficiency of the solution if there is a change.

Yao and Peng-Zhao (2010) deals with the object of e-government, they are the citizens. The evaluation proposed is based on citizen satisfaction. The citizen's satisfaction measurement assists the research to identify the real problem that exists in the e-government implementation. The research provides different point of view since most of the research fcus on the object, e-government.

Evaluation framework proposed by Panopoulou, Tamboris and Tarabanis (2008) is used to evaluate e-government websites in Greece. They state that the framework provides holistic approach to public authority website evaluation by evaluating four criteria mentioned above. Their framework applies three different level evaluations. The first level consists of four axes, the second level consists of some factors on each axis and the third level consists of some questions with the specific value range (0 – 10). Some modification has been made to provide more flexibility and functionality to the m-government.

### General Characteristics

The General Characteristics axis consists of few factors to be considered. The first factor is accessibility. It concerns on technical accessibility and the availability of specific supporting software link to download. Panopoulou, Tambouris and Tarabanis (2008) emphasize the accessibility for the disabled. However, there has not been any regulation provided in Indonesia concerning the website accessibility for disabled people. The website accessibility in mobile-government evaluation focuses only on the access speed and the universality of the websites since some websites cannot fully be viewed on mobile phones.

The next factor measured is navigation. The navigation measure means easiness degree of the website to be used by the users. There are many questions available regarding the navigation. The first question is about the navigation interface, whether is about the structure, the menu, the consistency, the activated links, the fonts, and the colours. Another question is about the availability of internal search engine or box in the websites. Those questions can be applied to e-government as well as m-government websites. The web navigation commonly similar in various displays.

The third factor in general characteristic is multilingualism. The measure consists of two questions; they are the number of foreign languages available in the websites and the content completeness for each language. However, the mobile-government evaluation only places one question regarding the availability of another language, whether the language is English or local languages. The fourth factor of general characteristic is privacy. This factor is really important especially if the websites collecting citizen data. The privacy statement should be placed on the websites. The evaluation framework examines this factor with three questions concerning the availability of privacy and security statement, whether the personal data is requested, and the availability of information on the usage of that personal data.

The final factor for general characteristics is public outreach. Panopoulou, Tambouris and Tarabanis (2008) assume this factor to be the ability of the website users to access all the information regarding the government online, they do not need to use telephone or mail to contact the officials. What they need to do is only go online and request or complain through it. However, in practice, that condition hardly exists. The website should provide the complete contact address including telephone and email since low competencies on technology and internet likely to exist. The assessment of public outreach factor for m-government consists of three questions concerning public authority contact details, the webmaster contact detail and the availability of any communication channel for sending requests or complaints.

### E-Content

Content is essential part of a website. The content of a website is expected to be reliable, accurate, relevant and useful (Garcia *et al.*, 2001, and Smith, 2001, cited in Panopoulou, Tambouris and Tarabanis, 2008). However, the content of desktop websites cannot directly apply to mobile websites. Adaptation is needed and Hassan, Jaber and Hamdan (2009) propose a framework for adapting the content of mobile-government. Four main contexts should be considered, namely personal context, mobile device context, connectivity context and location context. On the other hand, the e-content evaluation proposed by Panopoulou, Tambouris and Tarabanis (2008) is still able to apply since the measurement factors are more general requirements. Although the content adaptation framework is applied, the content still needs to be evaluated based on three factors mentioned below.

The first factor is general content. The general content here means any content that describe the officials such as the organisation profile, structure and formal statements. For the province and regency governments, content regarding the location profile, tourism, and information about business, education and local issues are evaluated. The questions rise from this factor are the number of pages available on the websites, the availability of links to other relevant websites and whether the content provided fit the web's organisation.

The second factor is about specific content. The specific content means the offered contents that are more specialised, for example: job opening, e-procurement, election, local events and additional local news. This factor makes the difference between the websites since each government body or agency handle different thing. There are three questions examining this factor. Those questions concern about e-procurement, budget and job vacancies in the organisation. However, mobile-government evaluation only uses one question concerning the existence of specific content.

The last factor of e-content is news and updating. The original evaluation framework measures this factor with three questions; they are news update schedule, local news availability and event calendar. While the evaluation

for mobile-government shrinks the questions into one question concerning the update indication because local news and event calendar can be classified as the second factor questions.

*E-services*

E-services mean online services provided in e-government websites. Capgemini (2006) states there are four levels of online sophistication, namely information, one-way interaction, two-way interaction and full transaction. Those levels describe the maturity of online public service delivery starting from the basic public service. In this evaluation framework, two factors are identified to describe the sophistication level of the online services.

The first factor measured in e-services is service number and level. Mobile-government cannot provide the same numbers as e-government websites; however some services are able to apply such as online payment, data entry, and information. If the mobile-government is connected to the mobile phones functions, SMS and calls can extend the functionality of e-services. The second factor is general information. It examines three things, they are specific contact details for the services (it can be email, address or telephone number); possibility for citizens to request additional information regarding the public services provided and the last thing is the availability of online-services other than information.

*E-participation*

E-participation is the final axis in the evaluation framework. Panopoulou, Tambouris, and Tarabanis (2008) define it as the ability of citizens to access the information and participate in public decision making. Based on few literatures such as OECD (2001), Peristeras, *et al.* (2009), Ekong and Ekong (2010) Panopoulou, Tambouris, and Tarabanis (2008) and United Nations (2010), three factors are proposed as e-participation parts, namely information, consultation and active participation. The same factors can be applied on mobile-government due to what Hagedorn (2008) claims that the next step of e-participation is m-participation. The claim is supported by Lallana (2007), m-government implementation in future can encourage citizens to be proactive in decision making, policy design and even nation-building, in terms of promoting e-democracy. However, Hagedorn (2008) argues that it cannot be implemented currently, since the low level technology applications such as SMS and audio (phone calls) are still more potential.

Regarding the adaptation of e-participation into m-government implementation, the three factors have been modified following the m-government condition. The first factor is information which is defined as the availability of online policy documents. It is completely about one-way communication, the citizens are on the passive side which seeking for information. Mobile-government websites hardly provide policy documents, however the policy should be explained in comprehensive and short way. The second factor is consultation which is defined as the two-way communication mode but limited. The question developed here is whether the mobile websites provide consultation on specific topics; the communication channel can be email

or SMS. Finally, the last factor is active participation which refers to the advanced two-way communication mode. The citizens have more power to participate actively on decision making process. They ideally can propose topics in forums and blogs or chat rooms.

**Table 3.**
**Evaluation Framework for Public Authority Websites Adopted from (Panopoulou, Tambouris and Tarabanis, 2008)**

| Axes | Factors |
|---|---|
| General Characteristics | Accessibility |
| | Navigation |
| | Multilingualism |
| | Privacy |
| | Public outreach |
| E-Content | General content |
| | Specific content |
| | News and updating |
| E-Services | Services number and level General information |
| E-Participation | Information |
| | Consultation |
| | Active participation |

## Research Methodology

This chapter explains the methodology used in this research. Creswell (2003) emphasizes three important things in designing research; they are knowledge claims, the research strategies and the last one is the data collection and analysis methods. This chapter provides brief explanation of those. This chapter starts from research philosophy (knowledge claims) and ends on data collection and analysis methods.

## Research Philosophy

Research philosophy is a framework that helps researchers in clarifying research design and guiding how the research should be conducted (Collis and Hussey, 2009). Wisker (2008) states it as the fundamental beliefs on how the research elements work together and assist the research discoveries. Blumberg, Cooper, and Schindler (2008) even underline it as the beneficial things that can direct research methodology.

Some scholars, such as Creswell (2003), and Bryman and Bell (2011), call research philosophy as research paradigms or knowledge claims. Gathering all the names and definitions, Pickard (2007) concludes them as a research methodology.

Researchers should have certain assumptions when they start researches on how the research will be conducted and what will the research gained (Creswell, 2003). Many scholars, for instance: Blumberg, Cooper and Schindler (2008), Collis and Hussey (2009), Wisker (2008), Matthews and Ross (2010), Blaxter, Hughes and Tight (2010), and Pickard (2007), has discussed various assumptions. There are two main research philosophies, they are positivism

and interpretivism. Apart from the two main philosophies, there are many others such as post-positivism, critical and postmodern. However, these philosophies still come from the same roots; they are the main research philosophies mentioned earlier.

**Table 4.**
**Research Philosophy Comparison**
(Adapted from Pickard (2007), Creswell (2003), and Blumberg, Cooper and Schindler (2008))

| Philosophy Assumptions | Positivism | Interpretivism |
|---|---|---|
| Point of View | Objective, realism | Subjective, relativist |
| Research motives | Independent | Not independent, human interest |
| Methodological assumptions | Deductive Quantitative Analysis by variables | Inductive Qualitative Analysis by case |
| Knowledge development | Start from simple elements to investigate phenomena | Start from whole phenomena to find the conclusion |
| Purpose | Prediction/ control/ explanation Flaming of general laws | Understanding/ reconstruction Transfer of findings |

The table below explains two main research philosophies based on some assumptions and principles. The assumptions are adapted from several sources. The assumptions limit each paradigm and fundamentally distinguish from each other.

Based on analysing the table, the most suitable philosophy for this research is positivism. Positivism is a research philosophy that tends to be paradigm in conducting business and social research (Collis and Hussey, 2009). Wisker (2008) adds that the positivism support the view that theories explain and predict phenomena, this leads to the use of scientific methods in conducting research. As a result of scientific methods application and positivism tendency, this research is conducted by analysing quantitative data, not qualitative.

This opinion is supported by the fact that this research starts from the questionnaire filled by 50 selected respondents in evaluating mobile-web through simple elements (such as general characteristics and services offered). Further explanation on how the respondents are selected is in the sampling selection part.

**Research Purpose**

Collis and Hussey (2009) explain that there are three types of researches; they are exploratory, descriptive, and analytical or predictive research. Furthermore they add that most of the researches conducted at postgraduate or doctoral level are analytical or predictive researches.

Descriptive research aims to briefly describe detailed explanation about a subject (Wisker, 2008). This research often uses quantitative data to provide detailed explanation on a subject, with questionnaires or interviews as the data collection techniques (Cavana, Delahaye, and Sekaran, 2001). Exploratory research is described by Cavana, Delahaye, and Sekaran (2001) as research conducted on subjects that rarely studied. Most of this research done in qualitative approach since deeper understanding needed while only little information available. Wisker (2008) says the subjects studied can be both simple and complex.

The third type is explanatory research. The explanatory research analyse the relationship between two or more research variables (Wisker, 2008). The relationship can be cause and effect or only correlation. Cavana, Delahaye, and Sekaran (2001) add that correlation research is preferable due to the complexity of the research subject. The last type, Predictive research is a research conducted to predict an outcome based on probability from the calculation of several variables (Wisker, 2008). The research hypothesis is based on data which is already collected.

This research purpose is to evaluate the mobile-government websites in Indonesia based on some criteria of the existing framework (general characteristics, contents, services offered and e-participation). Therefore, this research can be classified as the descriptive research. This research is also an explanatory research since the relationships between each variable are analysed.

**Research Approach**

Commonly, there are three kinds of research approach, either qualitative, quantitative or both. The names suggest on what kinds of data the research relies on. Blumberg, Cooper and Schindler (2008) explain that many research subjects can be analysed qualitatively as well as quantitatively, they conclude that no guidelines that strictly point a qualitative or quantitative research is more appropriate.

Another classification of research approach is mentioned by Balnaves and Caputi (2001), They say deductive and inductive are two major research approach in terms of data and theory availability. Deductive is when the research starts with a theory and the conclusion comes after it. The conclusion tests the existing theory based on the data gathered in observation process (Blumberg, Cooper and Schindler, 2008). While Inductive approach means drawing a conclusion from the data gathered as facts or evidence. The conclusion should explain the facts not test theories (Blumberg, Cooper and Schindler, 2008).

Quantitative research relies on numerical data. It is an approach that positivism use, since the belief is all phenomena is measurable and provable (Wisker, 2008). Quantitative research obviously deductive, most of the researches test assumptions or relationship with theories (Bryman and Bell, 2011). Wisker (2008) assumes numbers and statistics provide people with more comfortable feeling, this argument is supported by Pickard (2007) stating that quantitative research provides facts with more concrete framework, established from existing literature.

Qualitative research is inductive; the research is conducted to produce deeper understanding on a subject,

where the findings will generate theories (Bryman and Bell, 2011). The research mostly use non-numerical data gathered from interviews or focus groups. The research tends to be subjective since the findings are based on individual views (Bryman and Bell, 2011).

The approach of this research is quantitative approach. The existing evaluation framework from Panopoulou, Tambouris, and Tarabanis (2008) provides some variables which are counted quantitatively. The analysis gained based on specific percentage given to each metric. Objectivity is maintained by involving 50 selected respondents to evaluate each mobile-government websites.

## Research Design

After the research philosophy, purpose and approach are decided. The next step is deciding research design. Research design is an activity plan which guides the research procedure and usually it has brief time schedule (Blumberg, Cooper and Schindler, 2008). Bryman and Bell (2011) mention five research design types: experimental design, cross-sectional or social survey design, longitudinal design, case-study design, and comparative design

Experimental design is conducted to study the relationship between dependent and independent variables (Collis and Hussey, 2009). It is often used as benchmarking to other non-experimental researches. Cross-sectional design is used to collect data on different cases but in the same period of time (Collis and Hussey, 2009). In contrast, longitudinal design is a research done repeatedly in order to investigate the change over the time (Blumberg, Cooper and Schindler, 2008).

Pickard (2007) explains that case study design is in-depth and more specific research done on a subject. It is expected to produce detailed analysis from an intensive and holistic observation. Last of all, comparative design is a study of two or more cases by making comparison between them.

This research uses cross-sectional design. The research survey several variables of the mobile evaluation framework at a point in time (Conford and Smithson, 2006). There are several reasons why this design is chosen. First, this research uses more than one case (several mobile-websites) for each respondent to evaluate. The second reason is the limited time given for conducting this research. Longitudinal design has the advantage of identifying the changes over time which means given more accurate analyses, however it is time-consuming and expensive (Collis and Hussey, 2009) meanwhile cross-sectional design is inexpensive and able to conduct simultaneously.

The third, quantitative data used in this research can provide the comparison and association between the mobile-websites. Bryman and Bell (2011) states that it is uneasy to identify the causal relationship, however, this design is able to identify whether correlation exists between the variables (Collis and Hussey, 2009). The last reason, Bryman and Bell (2011) do state this design utilizes research instruments such as questionnaires and it is obviously quantitative approach, although qualitative approach can conduct cross-sectional design too.

## Data Collection Method

Data collection method is the third major element of research methodology (Creswell, 2003). It provides specific methods used to collect and analyse the data. Collis and Hussey (2009) discuss two main methods; they are interviews and self-completion questionnaires. Although it is common to use both of the methods, questionnaires are still the most widely used technique for research (Blaxter, Hughes and Tight, 2010).

This research uses questionnaires to collect the data about mobile-websites evaluation. The questionnaire answers may be qualitative or quantitative; however those will be coded to quantitative value data (Blaxter, Hughes and Tight, 2010). The calculation follows the existing evaluation framework.

### Questionnaire Design

Collis and Hussey (2009) remind that a questionnaire should be carefully designed and the questions should be well-structured. The questionnaire which is used for this research is based on the one that have been developed by Panopoulou, Tambouris and Tarabanis (2008). It has been adapted further to fit the mobile-website and mobile-government characteristics.

There are 29 questions in the questionnaire. There are 24 dichotomous questions and 5 nominal scale questions. The score of each question ranges between 0 – 10. Dichotomous question score is either 0 or 10 while nominal scale question score is between 0 – 10. The answers of the questionnaire questions are only quantitative.

Dichotomous questions are closed questions which provide yes/no answers. Closed questions are suggested by positivism approach since they are easy for the researchers to analyse and for respondents to answer (Brinkman, 2009; and Collis and Hussey, 2009). Collis and Hussey (2009) advise undergraduate and master students to use closed-questions and keep the open-question number as minimum as possible due to a limited time, although open-questions can provide much in-depth information but it is time-consuming (Brinkman, 2009).

There are 29 questions in the questionnaire. The number of questions is quite many since the evaluation tends to provide in-depth analysis. Less number of questions will not provide reliable analysis while too many questions can make the respondents bored and not objective.

### *Sampling Selection*

Sampling is a statistical practice which selects some elements of population to be analysed, it is done in order to gain some knowledge of the rest of the population (Blumberg, Cooper and Schindler, 2008). Pickard (2007) underline the impossibility to analyse the entire population of the research as the main reason why sampling is used. Obviously, it will be more representative to analyse the entire population, however the cost and time constraints make this impossible to conduct (Pickard, 2007)

There are two main types of sampling: probability sampling and non-probability sampling (Blaxter, Hughes and Tight, 2010). Probability sampling consists of simple random sampling, systematic sampling, stratified

sampling, cluster sampling and stage sampling. While, non-probability sampling consists of convenience sampling, voluntary sampling, quota sampling, purposive sampling, dimensional sampling and snowball sampling.

This research uses non-probability sampling technique called convenience sampling. This technique is conducted by selecting 50 respondents to evaluate the mobile-government websites. This selection procedure is carried out in order to acquire in-depth evaluation and represent mainstream users (Nielsen and Loranger, 2006). If the respondents are completely new to the mobile web, what the research reveals is only general things because they cannot get father into the sites.

These selected respondents are from Indonesia and able to operate mobile internet activity through their own mobile phones. They are Indonesian citizens from five different islands and five of them are Indonesian students in UK. 28 respondents use blackberry phones, 6 respondents use iPhones and the rest use other phones. Although it is not statistically representative concerning about the real Indonesia population and the limited time provided for this research, this research sample represents Indonesia population diversity in order to gain real picture of the evaluation.

Pickard (2007) reminds the urgency to carefully choose the sample; it has to be related directly to the research. 20 mobile-government websites are chosen due to the existence and the relation to the main theme, mobile-government practice in Indonesia. There are almost 500 Indonesian e-government websites available (E-Local Government Help Desk, 2010), however, only 25 mobile-government websites can be identified.

## Data Analysis

### Score calculation

**Table 5.**
**The Questionnaire Weighting Scheme**
**(Adapted from Panopoulou, Tambouris and Tarabanis (2008)**

| Factors | Weight | Axis | Weight |
|---|---|---|---|
| Accessibility | 20% | | |
| Navigation | 30% | | |
| Multilingualism | 20% | General Characteristics | 30% |
| Privacy | 10% | | |
| Public Outreach | 20% | | |
| General Content | 40% | | |
| Specific Content | 30% | E-Content | 20% |
| News and Updating | 30% | | |
| General Information | 25% | | |
| Service Number and Level | 75% | E-Services | 40% |
| Information | 30% | | |
| Consultation | 30% | E-Participation | 10% |
| Active Participation | 40% | | |

This research uses certain score calculation by following the calculation developed in Panopoulou, Tamboris, and Tarabanis (2008). All axis, factors and questions of the framework have certain weight to calculate their scores. Of course, the respondents do not know anything about the weighting scheme and there is no obligation to put the scheme (Brinkman, 2009). The summary of the weighting scheme is on the table below. The questionnaire with the question weighting is in the Appendix.

The score range is 0 – 10, nominal scale question answers are converted into 0 – 10 range. This conversion is possible since the scale practice with the same conversion procedure in order to ask people agreement or opinion is common (Brinkman, 2009). The scales such as Thurstone scale, Likert scale, and semantic differential scale are popular in terms of questionnaire scoring (Brinkman, 2009).

### Reliability and Validity

Validity and reliability are essential criteria for establishing the credibility value of quantitative research (Pickard, 2007; and Bryman and Bell, 2011). The research objectivity needs to be maintained regarding the research findings. Pickard (2007) emphasizes that the findings should be the result of research investigation, not the researcher's interpretation upon the research result.

Validity measures what the questionnaire is supposed to measure (Brinkman, 2009). Bryman and Bell (2011) define it as the integrity of the research conclusion. There are several types of validity in literature, such as measurement validity (construct validity), internal validity, external validity, ecological validity, content validity, and criterion validity.

Measurement validity is construct validity. This validity concerns whether the measure really reflects the concept that is measured. Internal validity concerns with the demonstration of causal relationship, while ecological validity concerns whether the findings can be applied in real situations, mostly about social scientific research (Bryman and Bell, 2011).

The next type, external validity concerns with the generalization of the specific research findings (Pickard, 2007). Bryman and Bell (2011) point out this validity as the main reason why representative sample number is needed. The last type is content validity; it measures whether the questionnaire consists of representative and suitable questions that indicate the concept of the research (Cavana, Delahaye, and Sekaran, 2001).

Reliability concerns about the research finding stability. The research is reliable when the research results can be gained repeatedly (Bryman and Bell, 2011). It should be stable if it is done in different time and locations (Pickard, 2007). Reliability is an important issue for quantitative research (Bryman and Bell, 2011). Regarding questionnaires, reliability value can be increased along with the question numbers (Brinkman, 2009).

Based on Bryman and Bell (2011), there are three major factors in deciding whether a research is reliable, they are stability, internal reliability and inter-observe consistency. Inter-observer consistency is necessary when there is more than one observer involved in the research.

Additionally, Brinkman (2009) also defines reliability as consistency, which can be measured by two methods: Split-half method or Cronbach's alpha. Of course, the simple way to measure reliability is by conducting the test-retest method (Bryman and Bell, 2011), but the time constraints often limit the research to be done repeatedly, especially for postgraduate level. This research used Cronbach's alpha method to count the reliability of the questionnaire data, while validity test was using several kinds of validity available in the literature.

*Statistical analysis*

The questionnaire data is analysed by using PASW 18. The statistical analysis is carried out after the reliability and validity test measured. Two statistics analysis are conducted, first is descriptive statistics and then inferential statistics.

Collis and Hussey (2009) state that most researches, at postgraduate level, are designed as analytical study. It starts from descriptive statistics then continue to inferential statistics. Descriptive statistics summarizes the questionnaire data into visual illustrations such as tables, graphics and charts. Inferential statistics provides conclusion on the population based on the quantitative data analysed (Collis and Hussey, 2009). It can be bivariate or multivariate analysis.

Kinnear and Gray (2010) emphasize the importance of acknowledging the type of data based on the number of measured variables. There are univariate data, bivariate data and multivariate data. The univariate data means the data is only one variable, while bivariate data means two variables and multivariate is more than two variable.

The univariate analysis concerns more on descriptive statistics such as central tendencies, spread or dispersion and the shape of the distribution. This research describes the central tendencies of the data, specifically the mean. Mean is the sum of quantitative data value divided by the number of the data (Blaikie, 2003).

The bivariate analysis used in this research is correlation analysis, specifically, by using spearman's rho. Spearman's rho is also known as Spearman rank correlation. This is the correlation analysis which is suitable for ordinal data. Correlation analysis provides information about association between two quantitative variables (Collis and Hussey, 2009). The association is measured by the correlation coefficient which has value ranged -1 to 1. This value indicates the direction and strength of the variable relationship.

In PASW 18, statistical significance test ($p$) is conducted to indicate the probability of the association in the population, in statistics it is defined as level of confidence. The value of $p$ is considered as acceptable if it is less than 0.05 or 0.01 (Kinnear and Gray, 2010). This research applies the same rules; $p < 0.05$ is the indication of correlations between variables.

## FINDINGS AND DISCUSSION

### Introduction

In this chapter, the results of the evaluation on mobile-government websites in Indonesia are explained. It consists of reliability and validity, descriptive analysis on the questionnaire data along with all the explanation behind the result, and the correlation between all variables. This chapter is ended by the discussion on the implementation mobile-government in Indonesia based on the stage model of e-government development and the framework evaluation.

### Reliability and Validity

As mentioned earlier on chapter three, Research methodology, Reliability and validity build credibility value on quantitative research (Pickard, 2007). This part explains briefly the reliability and validity tests conducted on the data. Concisely, the reliability and validity tests conducted below support this research credibility.

### Reliability Test

Reliability test conducted in this research data is Coefficient or Cronbach's Alpha. The first 30 respondent questionnaires are chosen for the reliability test. The test result is:

**Table 6.**
**Reliability test**

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| .898 | .899 | 26 |

The Cronbach's alpha value is 0.898. Based on Shifflett (2011), the ideal value for Cronbach's Alpha is ≥ 7.0. It indicates that the questionnaire items of this research are reliable along with the respondents' answers.

The reliability test result shows that there is consistency in the questionnaire and the respondents' answers. So the research is reliable.

### Validity Test

There are various validity tests available; those are utilized for measuring that the questionnaire measures what it is supposed to measure (Kinnear and Gray, 2010). Brinkman (2009) states that at the same time, a measure cannot be unreliable and valid but it can be reliable and not valid. Consequently, reliability is a necessary condition for validity (Kinnear and Gray, 2010).

The validity of this research is measured from several points. The first is about the content. This research uses the framework and adopts the questionnaire and its scale from the previous research conducted by some scholars. Therefore, the content validity of this research has been assured. The second is about the generalization of the research findings. This research evaluates 20 mobile-government websites out of 25 mobile-government websites in Indonesia. The sample number is close to the population number. Therefore, the external validity which concerns with the result applicability for other cases defined by representative sample (Bryman and Bell, 2011) has been assured too. The research and data are also checked

manually in order to measure each questionnaire and its answer is correct. At this point, the research conducted here has valid data and is ready for further analysis.

The validity and reliability are already ensured, the next step is data analysis with PASW 18. The first analysis is descriptive analysis, and then continues to the inferential analysis, correlation between all variables.

### Descriptive Analysis

After reliability and validity tests assured, the questionnaire was distributed to 50 selected respondents. In total, 20 websites were evaluated from 25 available mobile-government websites in Indonesia. Those websites are grouped into two main categories representing their main operational level. The central governments consists of national-level government bodies, such as House of Representatives, the Ministries and the departments, and also the state commissions and non-department institutions. The other category is the governments of provinces and regencies such as provincial governments, district authorities and city authorities. The complete list of all the sample websites and the government bodies they represent are listed on the appendix section.

The evaluation framework proposed by Panopoulou, Tambouris and Tarabanis (2008) is adopted and modified to fit the mobile-government circumstances. However, for the easiness purpose, the names for all axis provided are not changed. The framework axes are still General Characteristics, E-Content, E-Services and E-Participation. The weighted proportion is defined in the previous chapter.

Table 7 is the average score of both groups in the scale of 0 – 10. The samples have been grouped and calculated for each axis. The table shows that mobile-government websites in Indonesia have high scores in E-content factors. It indicates that the governments emphasize the content more than the other factors. While the rest have relatively low scores around 5 on the averages. The table shows that General Characteristics has the lowest score compared to the others. This factor definitely needs further improvement since it consists of accessibility, navigation and privacy. Those factors are important for the users (Nielsen, 2009) otherwise the websites will not have visitors.

**Table 7.**
**Average scores of mobile-government websites in Indonesia**

| Mobile Websies | Central Governments | Provincies/ Regencies/ Cities | Total |
|---|---|---|---|
| N | 13 | 7 | 20 |
| General Characteristics | 5.66 | 4.84 | 5.25 |
| E-Content | 7.68 | 7.03 | 7.35 |
| E-Services | 5.92 | 4.89 | 5.41 |
| E-Participation | 6.54 | 4.29 | 5.41 |
| **Total** | 6.45 | 5.26 | 5.85 |

Thisresultsshowsthatthemainevaluationorientation is different from the real practice. The governments place emphasis mainly on E-Content, meanwhile the evaluation framework proposed here places the greatest weight on

E-Services (40%). The evaluation result shows that people do not see enough services available on mobile-websites that please them. What they identify from the mobile-government websites is information display. The same result in E-Participation score shows that the government has not paid more attention to citizen participation through mobile websites.

There are other ways to illustrate the questionnaire result, they are graph and chart. The Figure 1 displays the questionnaire result in form of the column chart. The chart displays clearly that E-content leading the score average while for central governments, E-Participation is the second followed by E-Services and General Characteristics as the last. The mobile-government of Provinces and Regencies shows different result, E-services as the second slightly better than General Characteristics and the last one is E-Participation. The difference between the groups pictures that central governments group has better scores compared to the group.

This condition is possible since the central government groups have wider visitors, higher budget and heavier burden to carry out. Meanwhile provinces and regencies group has fewer visitors compared to central government groups, lower budget and lighter burden to carry. However, e-participation scores for provinces and regencies group are not good scores. As provinces and regencies, the group members should be in the position of closer to citizens than central government group members. E-participation here does not mean direct communication via online but only availability of contacts, channels and information.
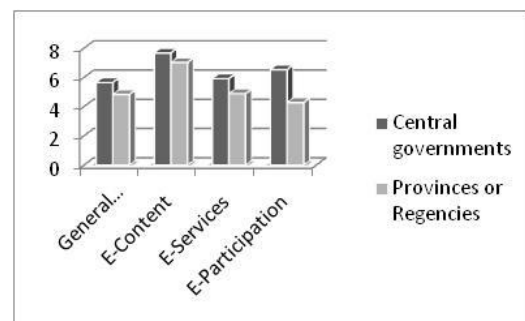


**Figure 1. Average scores of mobile-government websites in Indonesia**

In general, the central governments group scores better than the other group. Logically, the central governments group provides wider and broader topics whereas the other group only provides topics related to the authorized areas. However, the result display in term of E-Services and E-Participation gives evidence that the provinces and regencies group should improve more. There should be more variety of services provided by the province and regency level, such as ID card, driving license, voting, and various licenses. The province or regency levels demand more than on central government level.

The radar chart on Figure 2 can provide better visual sight than the column chart. Although the Central Governments group has better scores in every axis, the chart displays that both groups tend to have the same

emphasis and orientation. The chart also shows the urgency of the Provinces and Regencies to improve their scores in E-Services and E-Participation, their low scores show that the mobile-government still in the level of information display not in the more interactive level. However, the effort of central governments group in providing channels, contacts and information regarding e-participation should be positively respected.
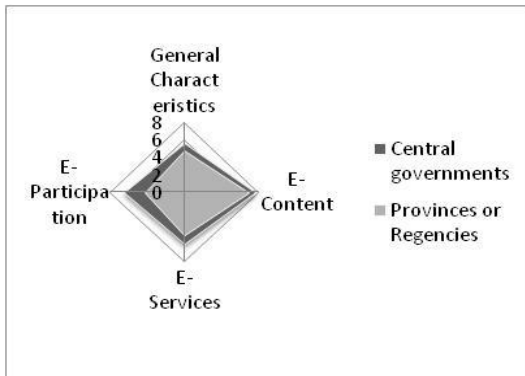


**Figure 2. Average scores of mobile-government websites in Indonesia**

## General Characteristics

All groups have low scores in terms of multilingualism and privacy. This result is really unpleasant since there are 742 local languages in Indonesia (Yurnaldi, 2008), and no province and regency provides local language for the mobile website language option. The central governments group has provided multilingual mobile-websites, although most of them only provide English version with limited content. The privacy factor is also rather low for both of the groups. It indicates the mobile-websites are still not able to guarantee the users' privacy. The real problem of privacy question is not about the statement, but it is about the secure and safe feeling of the citizens in using the m-government services.

In contrast, navigation and accessibility factors show high scores. It shows that the mobile-government websites provide satisfactory navigation and accessibility features. However, this result does not include the accessibility to disabled people since no question is intended to. The accessibility factors included here are only access speed and browser accessibility.
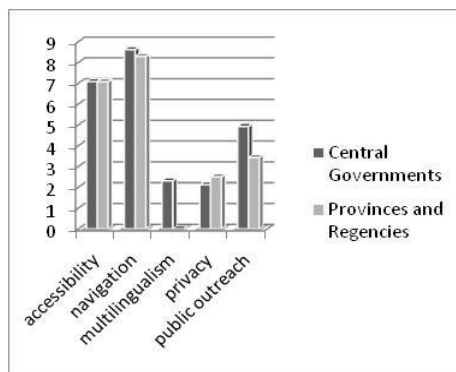


**Figure 3. Average scores of General Characteristics**

In terms of public outreach, the result displays relatively low score. It indicates that communication between citizens and governments is less, this leads to the urgency of improvement to optimise the communication since that factor is important and unique for mobile-government compare to other non-government mobile sites.

The benefit of m-government is the ability to reach the citizens 24/7, vice versa. If the 'public outreach' scores much lower than the others. The question remains on how the government utilised this opportunity. The government of provinces and regencies get indications that the mobile websites they operate have fewer score on public outreach than the central governments group.

The result of general characteristics also shows that the citizens still see the websites more as the information display than the channels for communicate with the government representatives. This condition is the picture of first stage of e-government development models.
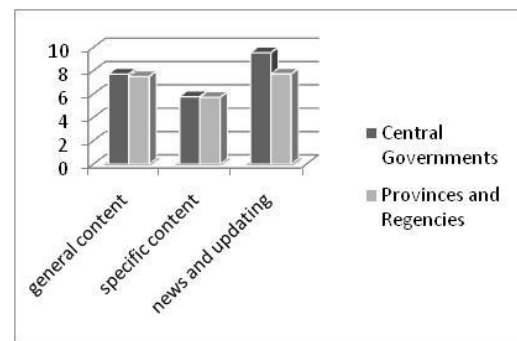
## E-Content



**Figure 4. Average scores of E-Content**

E-Content column chart on figure 4 displays the superiority of news and updating factor score. The result shows that most of mobile-government websites have news section and are regularly updated. However, the general content concerning the government bodies themselves do not acquire scores as high as the news and updating factors' scores. On the other hand, specific content scores are the lowest compared to general content and news and updating. The scores show that specific content such as e-procurement and events have limited portion on the mobile websites. The Provinces and Regencies group should be able to improve this content since the mobile-government orientation is to fulfil the citizens' needs.

The content provided by m-government commonly place news and information on the first webpage and put the other things on the next webpage. E-content has three different content, general content concerns about the organisation profile, specific content concerns about the things that the organisation handle day by day, and the last is news that can be news from others.

## E-Services

The result displays that central governments websites get higher scores in terms of E-Services on both of the factors. The general information factor gets higher scores compared to service number and level. This proves the government effort in providing general information has

been achieved, however the other factor score indicates the mobile-government websites do not offer online service as the citizens expected. Low scores on both groups compared to general information factor still shows that mobile-government function nowadays is still as information display, not more.
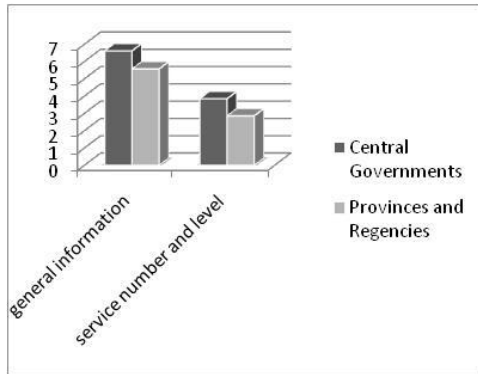


**Figure 5. Average scores of E-Services**

## E-Participation

E-Participation shows that Central Governments group gets very high score on information factor, while low scores on consultation and active participation factors. This supports the position of mobile-government nowadays as the information display than two-way communication facility. The Provinces and Regencies receive low scores on those three factors showing that citizens have limited way in participating and giving feedback on everything via online. These scores also provide more expectation on the Provinces and Regencies to improve their scores since the group position in reality is closer to citizens than the Central Governments group.
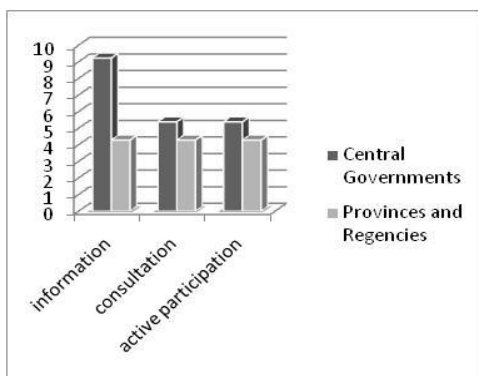


**Figure 6. Average scores of E-Participation**

## Correlation between variables

The next step is correlation analyses. The analyses were conducted on the data from all the 20 mobile-government websites and on the data from each group. The correlation analyses were performed on PASW 18 to explore relationship between variables. The Spearman's rho method is chosen based on the consideration that the framework uses dichotomous and ordinal data (Panopoulou, Tambouris and Tarabanis, 2008).

## Correlation on all mobile websites

- The result of the correlation analysis on all mobile-government websites shows that:
- There is a high positive correlation between general characteristics and e-services axes.
- There is a high positive correlation between general characteristics and e-participation axes.
- There is a high positive correlation between e-content and e-services axes.
- There is a high positive correlation between e-services and e-participation axes.
- There is a moderate positive correlation between e-content and general characteristics axes.

The high positive correlation shown by general characteristics with e-services and e-participation indicates that the emphasis on e-services and e-participation may likely influence the general characteristics and vice versa. The same assumption applies on the relationship between e-content and e-services as well as between e-services and e-participation. All mobile-government websites in Indonesia seems to concentrate more to e-content, while based on the correlation analysis conducted here, the real main spot here is e-services. The e-services relationship shows that the improvement of e-services may influence the other axes.

**Correlations on all mobile webs**
**Table 8.**
**Correlation on all mobile-government websites**

| | | | General Charac-teristics | E-Content | E-Services | E-Parti-cipation |
|---|---|---|---|---|---|---|
| Spear-man's rho | General charac-teristics | Correlation Coefficient | 1.000 | .472* | .696** | .857** |
| | | Sig. (2-tailed) | . | .035 | .001 | .000 |
| | | N | 20 | 20 | 20 | 20 |
| | E-Content | Correlation Coefficient | .472* | 1.000 | .778** | .398 |
| | | Sig. (2-tailed) | .035 | . | .000 | .082 |
| | | N | 20 | 20 | 20 | 20 |
| | E-Services | Correlation Coefficient | .696** | .778** | 1.000 | .652** |
| | | Sig. (2-tailed) | .001 | .000 | . | .002 |
| | | N | 20 | 20 | 20 | 20 |
| | E-Partici-pation | Correlation Coefficient | .857** | .398 | .652** | 1.000 |
| | | Sig. (2-tailed) | .000 | .082 | .002 | . |
| | | N | 20 | 20 | 20 | 20 |

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

## Correlation on Central Government mobile websites

The result of the correlation analysis on central government websites shows that:

- There is a high positive correlation between general characteristics and e-participation axes.

- There is a high positive correlation between e-content and e-services axes.
- There is a moderate positive correlation between e-services and general characteristics axes.
- There is a moderate positive correlation between e-services and e-participation axes

There are high positive correlations shown between general characteristics and e-participation axes as well as between e-content and e-services. Here, the e-participation axis has better scores than e-services and general characteristics. This condition indicates that the central government group has tried to develop e-participation especially House of Representatives and Corruption Eradication Commission. Once again, the main spot here is e-services, since the e-services relationship shows that the improvement of e-services may influence the other axes.

## Correlations on central government webs Table 9.
### Correlation on central government websites

| | | | General Charac-teristics | E-Content | E-Services | E-Parti-cipation |
|---|---|---|---|---|---|---|
| Spearman's rho | General Charac-teristics | Correlation Coefficient | 1.000 | .499 | .627* | .835** |
| | | Sig. (2-tailed) | . | .082 | .022 | .000 |
| | | N | 13 | 13 | 13 | 13 |
| | E-Content | Correlation Coefficient | .499 | 1.000 | .812** | .409 |
| | | Sig. (2-tailed) | .082 | . | .001 | .165 |
| | | N | 13 | 13 | 13 | 13 |
| | E-Services | Correlation Coefficient | .627* | .812** | 1.000 | .647* |
| | | Sig. (2-tailed) | .022 | .001 | . | .017 |
| | | N | 13 | 13 | 13 | 13 |
| | E-Partici-pation | Correlation Coefficient | .835** | .409 | .647* | 1.000 |
| | | Sig. (2-tailed) | .000 | .165 | .017 | . |
| | | N | 13 | 13 | 13 | 13 |

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

## Correlation on Province and Regency mobile websites

The result of the correlation analysis on provinces and regencies websites shows that:
- There is a high positive correlation between general characteristics and e-participation axes.
- There is a moderate positive correlation between e-content and e-services axes.

The high positive correlation shown by general characteristics with e-participation indicates that the axis may influence each other. The questionnaire reveals that the provinces and regencies group places more emphasis on e-content. Although there is a need to place more emphasis on e-services and e-participation, this group seems put little effort in providing those axes in its websites.

This correlation analysis shows the positive relationships between axes. By improving e-participation and e-services, there likely influence on general characteristics as well as e-content.

## Correlations on province and regency mobile webs Table 10.
### Correlation on provinces and regencies websites

| | | | General Charac-teristics | E-Content | E-Services | E-Parti-cipation |
|---|---|---|---|---|---|---|
| Spearman's rho | General Charac-teristics | Correlation Coefficient | 1.000 | .396 | .818* | .899** |
| | | Sig. (2-tailed) | . | .379 | .024 | .006 |
| | | N | 7 | 7 | 7 | 7 |
| | E-Content | Correlation Coefficient | .396 | 1.000 | .771* | .324 |
| | | Sig. (2-tailed) | .379 | . | .043 | .478 |
| | | N | 7 | 7 | 7 | 7 |
| | E-Services | Correlation Coefficient | .818* | .771* | 1.000 | .626 |
| | | Sig. (2-tailed) | .024 | .043 | . | .132 |
| | | N | 7 | 7 | 7 | 7 |
| | E-Partici-pation | Correlation Coefficient | .899** | .324 | .626 | 1.000 |
| | | Sig. (2-tailed) | .006 | .478 | .132 | . |
| | | N | 7 | 7 | 7 | 7 |

*. Correlation is significant at the 0.05 level (2-tailed). **.

Correlation is significant at the 0.01 level (2-tailed).

## Discussion

This section provides in-depth discussion on the research findings and analyses. There are two objectives based on the research question in the introduction chapter. The first objective is the implementation of mobile-government in Indonesia based on the stage model of e-government development; it discusses how far the Indonesian government has developed the mobile-government. The second objective is the discussion on the framework evaluation result.

## The implementation of mobile-government in Indonesia based on the stage model of e-government development

The development of mobile-government websites in Indonesia is not equal to the development of e-government in Indonesia. 25 mobile websites identified cannot be compared to almost 500 e-government websites. However, the development of mobile phones and mobile internet in Indonesia has given good prospect for mobile-government to develop further. The explosive growth of mobile internet compared to any other telecommunication solution

provides the chance, now it depends on the government whether that opportunity will be used.

Unfortunately, the mobile-government implementation in Indonesia seems still in the first stage of the stage model of e-government development. Most of the mobile webs are only informational. Few webs such as House of Representatives, Corruption Eradication Commission and Cabinet Secretariat have provided other services than information, however the services have not achieved the level connected or integration. Most of the better services are only two-way communication and sending requests or complaints. The updated activity available is only about the information and news updating.

The implementation on transactional, integration, participation and operational is still far. The low scores on e-services, e-participation and general characteristics indicate that the citizens have no opportunity to be actively involved in mobile-government implementation but the passive users.

The implementation of mobile-government in Indonesia based on the framework evaluation.

Based on the evaluation result, all the mobile-governmentwebsitesfocusone-contentande-participation. The content here is updated regularly especially about news and information, however the low e-services scores provide evidence that the content and e-participation provided are one-way communication method only.

Only 50% of the sample provides e-participation, and it is not two-way communication as it is intended to be. Most of the communication provided here is email based without any confirmation when will be responded. On the other hand, the availability of the e-participation has indicated good prospect for mobile-government in Indonesia in future.

General characteristics, especially privacy and multilingualism need to be improved. The low score on privacy means low trust on the m-government websites and it means low trust on the e-services provided. The low score, actually, cannot directly interpret as no trust. It is more to the request from the citizens for government initiative in assuring the privacy and security when browsing the m-government services.

Multilingualism should not always be English; there are more important languages to be prioritized such as local languages. Multilingualism is quite important, especially for provinces and regencies group. Local languages can reach the wider public and citizen to participate and use m-government. For central governments group, multilingualism can be referred as the English facility since the public orientation is not only local people in certain area but also people from different places and different countries as well.

In future, the desirable improvement is on e-services. The citizens do not find much benefits if the m-government implementation is still in the same condition for few years to come. High expectation for e-participation improvement especially regarding the online participation tools supporting m-voting and m-democracy is not crucial. The best option to be improved is on the e-services and general characteristics axes. Low scores indicate the urgency for improvement, multilingualism and privacy should be

considered. When the privacy score rises, there is possibility that e-participation tends to rise since the correlation between these two axes is high and positive. However, these improvements will depend on the government at the moment. If the government considers those axes important then the improvement are executed, the e-government and m-government objectives will be achieved.

**CONCLUSION**

This research was conducted by utilizing the evaluation framework proposed by Panopoulou, Tambouris and Tarabanis (2008). The research result shows that m-government implementation in Indonesia focuses more on e-content. The charts in the previous chapter display that news and updating has the highest score for e-content. In contrast, specific content is the lowest of three. This finding shows that most of m-government in Indonesia depends on news in the websites. This condition needs to be developed further.

The other good scores are for navigation and information on active participation. Most of m-government websites already have good navigation; the users can easily operate and browse the webs. The citizens also scored active participation quite high, the information factor provides better score than the others especially central governments group.

On the other hand, less concern is placed on e-services and general characteristics. The low scores on multilingualism, privacy and specific content, e-services, consultation and active participation indicate that there is much homework for the government to finish. At least, these scores help Indonesia government to identify the weaknesses and things that need to improve.

The trust issue can be dominant answer here. M-government needs to build credibility by rising the privacy score. Multilingualism should be improved by providing another language options such as English or local languages. E-services might be the most important axis to develop because the research result shows high positive correlation between e-services with the other axes. Although each factor should get the same concern from the government, e-services must be prioritized.

The next result concerns about the e-government development model. M-government implementation in Indonesia is still in the first stage of e-government development model, the informational stage. It means m-government in Indonesia needs to be developed and improved further so it can step on to the next stages. The implementation of e-government and m-government will be effective and efficient if Indonesia in future is able to provide interactive services, m-voting and e-democracy.

The recent condition for m-government implementation in Indonesia shows good prospect in future. However, the development and improvement depends on how the Indonesian government formulates and executes their plan. Supported by the regulations and enthusiastic government bodies, the implementation of m-government might achieve the highest stage of e-government development in future.

## Limitations in the research

This research has several noticeable limitations:

Firstly, the time and resources for conducting this research are limited. There are only 50 respondents available and returned the questionnaires. It is realized that subjective answers probably came up although the questionnaire tends to get objective answers. However, the result still shows good reliability and correlation for some variables shows positive and significant.

Second, the research tends to be technological point of view. All the questionnaire questions were formulated based on the use in terms of technology itself. It does not count other aspects such as social or politics, which in reality various aspects might influence the findings.

Third, there is no clarity on the ideal number of services offered online (Panopoulou, Tambouris and Tarabanis, 2008). Another problem is the low number of online services does not judge the web as the bad web. There is unfair situation when a website of an institution gets a low score only because it does not have any service to offer.

Fourth, the evaluation framework used in this research is not perfect. It was developed with the point of view that all government institutions have same requirements in their websites and their mobile websites. This is unfair judgement since each government body or agent has different job and responsibility, the number of services offered cannot become the parameter.

Fifth, there might be too many questions and too many websites to evaluate. This leads to not objective answers that were collected. The situation was not good either for the researcher, if the questions are only few, the result will be shallow and unreliable.

## Suggestions for future research

Based on the research conducted, some suggestions are given here:

Firstly, the similar research can be conducted with more people as respondents. With longer time available, probably the research is able to yield more reliable result. Since more people gathered means better and more reliable data, the questionnaire should have been sent earlier to collect answers as many as possible.

Second, it is suggested to conduct longitudinal study for capturing the changes of the web over the time. This study design might achieve more reliable findings. By cross-sectional study, the result might be bias since the limited time and limited sample. Longitudinal study costs higher and spends time longer, but the result obviously more reliable.

Third, it is also suggested to conduct qualitative research in order to get another point of view. This can be social point of view, politics or culture. These points of view can provide better insight. The mixed method can also be applied here by combining it with quantitative research might produce in-depth result.

Fourth, researching based on the number of services offered does not provide the complete picture of the result. A better examination on the services might produce better findings. Based on the limitation mentioned earlier, the number of services offered does not mean the website is better (Panopoulou, Tambouris and Tarabanis, 2008).

Fifth, the research is done by scoring from one side only, the governments or the public authorities. The measurement is made based on the calculation and compares it between institutions. It is suggested to provide another research measuring the citizens' demands. In that case, there is more fair judgement based on supply and demand measurement.

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