7-15-2012

Benchmarking Indonesian Local E-Government

Nurdin Nurdin
Faculty of ICT , Swinburne University of Technology, VIC, Australia, nnurdin@swin.edu.au

Rosemary Stockdale
Faculty of ICT, Swinburne University of Technology, VIC, Australia, rstockdale@swin.edu.au

Helana Scheepers
Faculty of ICT, Swinburne University of Technology, VIC, Australia, hscheepers@swin.edu.au

Follow this and additional works at: http://aisel.aisnet.org/pacis2012

BENCHMARKING INDONESIAN LOCAL E-GOVERNMENT

Nurdin Nurdin, Faculty of ICT , Swinburne University of Technology, VIC, Australia, nnurdin@swin.edu.au, STAIN Datokarama Palu, nurdin@stain.ac.id and STMIK Bina Mulia Palu Indonesia, nurdin69@gmail.com

Rosemary Stockdale, Faculty of ICT, Swinburne University of Technology, VIC, Australia, rstockdale@swin.edu.au

Helana Scheepers, Faculty of ICT, Swinburne University of Technology, VIC, Australia, hscheepers@swin.edu.au

Abstract

This paper describes the status of local e-government in Indonesia using the United Nations e-government benchmarking model. Using data from the Indonesia Ministry of Internal Affairs, we examined 353 local government websites from early March to the end of May 2011. The results show that the majority of local government websites (193) are still at the emergence stage, 98 are at the enhanced stage, 61 are at the interactive stage, and only one local government website has achieved the transaction stage. None of the local e-government websites have moved to the final stage of e-government according to the UN model. Our findings also show that some local government websites are not well managed and maintained and that local government websites do not comply with central government standardization requirements outlined in the e-government blue print.

Keywords: Local Government, E-government, Benchmarking, Indonesia

1   INTRODUCTION

E-government is defined as "a web-based information system which provides online services and an interaction channel" (Al-Haddad, Heyland, & Hubona, 2011, p. 1). E-government systems can contribute to improved efficiency, cost-savings, and faster services delivery across government agencies (Moon, 2002; Wauters, 2006). In an attempt to realize such benefits, more governments across the globe have adopted and implemented e-government systems to boost their organizations' performance and responsiveness. Previous e-government benchmarking methods, such as used by the United Nations (2008) and Wauters (2006), show that e-government has already moved from merely a web presence and information dissemination to fully integrated or connected government. However, not many governments have moved to the highest level of e-government evolution, particularly in developing countries.

Benchmarking is defined as "a process whereby an organization evaluates its operations by comparison to similar organizations" (Mosse & Whitley, 2009, p. 155). In the context of e-government, benchmarking means a review of e-government performance status between nations or agencies (Heeks, 2006). Previous studies on e-government status (e.g. Graafland-Essers & Ettedgui, 2003; Jaeger, 2006; Lee, Tan, & Trimi, 2005) have provided a snapshot of how countries have evolved their e-government systems. Those studies, which were conducted in developed countries such USA, England, Australia, Japan, and Finland, found that most countries have made significant progress in e-government. Their websites provide citizens with greater access to public administration and services. On the other hand, studies carried out in developing countries (e.g. Grant, 2006; Kuschu & Kuscu, 2003) show most e-government systems in such countries are still at an early stage and merely provide basic information on their websites.

The above phenomenon is in accordance with the United Nations (2008) benchmarking method that shows most e-government systems in developing countries such as in Asia, Africa, South America and East Europe still remain at the emergence stage which mainly consists of a web page or an official website with static information and lack citizens' interaction. However, the United Nations' (2008) study describes e-government status at central government levels and current detailed information on the current state of e-government within local government in developing countries has received limited attention. In the context of developed countries, such as in the US (Kaylor, 2001; Moon, 2002; Reddick, 2004) and the UK (Dave Griffin, Foster, & Halpin, 2004; Mosse & Whitley, 2009), studies on local e-government websites status have been carried out to provide details on the status of each local e-government such as at city and municipality levels.

Indonesia, with the biggest population of any developing country after India, informally started implementing e-government at the local government level in 2001. Bastian (2003) from the Indonesia National Development Bureau (BAPENAS) states that the majority of e-government in Indonesian is at an early stage and very little has reached the transactional stage. However, no empirical data on the current state of Indonesia e-government systems have been collected to support this claim. As a result, it is difficult for the Indonesian government, practitioners, and academics to understand the current state of Indonesian e-government since it was formally launched in 2003.

This study seeks to address this gap and to evaluate the current state of e-government within Indonesian local governments to provide a benchmarking tool that will inform the advancement of e-government adoption and implementation within Indonesian local government. A comparative evaluation of all local government capacity in online services and products provision will also be provided through this study. The empirical findings will support the Indonesian government in planning, goals setting, resource allocation and decision-making related to e-government implementation initiatives.

In carrying out this study, we use local government websites as the main data source for the evaluation. We argue that website information is a reliable source to understand e-government and to draw conclusions on current status because websites can provide us with information on the success and the failure of e-government and the maturity level of e-government (Panoupoulo, Tambouris, &

Tarabanis, 2008; Wang, Bretschneider, & Gant, 2005). The United Nations (2008) also use government websites as a main source to evaluate e-government status across the globe. In this study we address the following research question: **What is the status of e-government adoption by Indonesian local governments?**

This paper is presented as follows: the next section discusses evaluation models of e-government stages and how they are applied. The criteria to evaluate and determine each stage of e-government are discussed in the following section. After that, e-government in the Indonesian context is presented. We describe our methodology for data gathering prior to presenting the results of the survey and discussion, while conclusion and future research are presented in the final section.

2 E-GOVERNMENT EVALUATION MODELS

E-government evaluation has become an important tool in monitoring the development of government efforts to enter the online environment (Kunstelj & Vintar, 2004; Lenk & Traounmuller, 2002). Evaluation is useful to understand the current state of e-government, for example for capturing the progress and current status. Moreover, detailed assessment of government websites can help governments obtain information and use it to develop nation online strategies (Henriksson, Yi, Frost, & Middleton, 2006). The information can also be used to determine goals and planning, resource allocation, strengths and weaknesses, and future guidelines (Kunstelj & Vintar, 2004; United-Nation, 2003).

Several models to evaluate e-government stages (see table 1), both in developed and developing countries, have been proposed. For example, Layne and Lee (2001) argue that e-government can be categorized into four stages; catalogue, transaction, vertical integration, and horizontal integration. In conrast, Reddick (2004) argues that e-government development is better grouped into only two stages because there is very little evidence that the last two stages proposed by Layne and Lee (2001) can be found, particularly at municipal levels. However, the Reddick (2004) model might not reflect current e-government development stages since the study was carried out almost a decade ago and is therefore not included in the table 1.

Stage	(Klievink & Janssen, 2009)	(United-Nations, 2008)	(Janssen & Veenstra, 2005)	(Moon, 2002)	(Layne & Lee, 2001)	(Watson & Mundy, 2001)
1.	Stovepipes	Emerging	No Integration	Information dissemination	Catalogue	Initiation
2.	Integrated organizations	Enhance	One to one integration	Two-way communication	Transaction	Infusion
3.	Nationwide websites	Interactive	Warehouse architecture	Services and financial transaction	Vertical Integration	Customization
4.	Inter-organizational integration	Transaction	Broker architecture	Vertical and horizontal integration	Horizontal Integration	-
5.	Demand-driven, joined-up government	Connected	Orchestrated broker architecture	Political participation	-	-

Table 1. Models of e-government stages

Klievink & Janssen (2009) use their model to describe current and future ideal development of e-government in the Netherlands which helps local organizations to integrate e-government infrastructure with central government. The United Nations (2008) uses the five stage e-government model to benchmark e-government across countries by comparing previous and current status. The United Nations (2008) has applied the model regularly since 2003 for e-government benchmarking across the world. Both Janssen and Veenstra's (2005) and Layne and Lee's (2001) models are used to

describe the growth of e-government at local and central levels, although Janssen and Veenstra's (2005) model is difficult to apply in e-government evaluation through website analysis. This is because it requires evaluating internal government organizations particularly to understand the state of data integration between back and front office. At local government level, Moon (2002) used his own model to evaluate the progress of e-government adoption and implementation by municipalities in the US. Meanwhile, Watson and Mundy (2001) used their model to describe the development of e-democracy on government websites.

The models presented in table 1 have been applied in e-government evaluation either in the context of empirical investigations within government organizations (e.g. Klievink & Janssen, 2009) or by analysing governments' website content (e.g. Cursey & Norris, 2008; Moon, 2002; Watson & Mundy, 2001). Direct evaluation within government organizations can provide an assessment of e-government status from the employees' perspective which then helps government to manage and improve the sites. Meanwhile using websites as an evaluation tool can support e-government evaluation from a citizen perspective particularly when e-government is understood in the context of web-based information systems which provide online services and interaction (Al-Haddad, et al., 2011). The websites enable external stakeholders to find what services are available and how the services can be obtained without direct investigation into government organizations. This indicates that the provision of e-government sytems through the Internet is critically important for citizens' access to services and for engagement.

The United Nations' (2008) benchmarking model reflects the current status of e-government systems in both developed and developing countries. Most e-government in developing countries is at the emergence or broadcast stage where the government websites only provide static information and very few interaction facilities (Wagner, Cheung, & Lee, 2003). This means most of the information and services provided on their websites might be categorised within the first or second stages of the UN stage model (2008). Other models might not reflect current understanding of the state of e-government in developing countries because the models were previously applied in developed countries where e-government criteria are more sophisticated.

E-government benchmarking can be used as an evaluation method to assess government organizations and systems performance (Bannister, 2007) or "as a process whereby an organization evaluates its operations by comparison to similar organizations" (Mosse & Whitley, 2009, p. 155). Benchmarking can also be applied as an instrument to classify government websites according to their performance such as accessibility and loading time. An example of such benchmarking is the UK local government websites classification (Mosse & Whitley, 2009). This can help government to develop best practices in e-government through benchmarking themselves with other e-government systems

The analysis of websites to understand e-government status is considered an important strategy in the public sector and as such is used as a method for benchmarking (Barnes & Vidgen, 2000; Gant & Gant, 2002; Heeks, 2006). The websites can provide information on the functionality of e-government such as type of services and how to access the services (Wang, et al., 2005). This information can be used to determine the level of e-government development and the completeness of services provided on the sites. For example, to what extend the websites allow citizens to make transactions, minimize time and reduce cost when they use it (Economides & Terzis, 2008). E-government website evaluation can also inform policy makers and other agencies about how e-government has performed (Heeks, 2006) from an external point of view.

3   CRITERIA FOR E-GOVERNMENT DEVELOPMENT

There is no common agreement on the criteria of each stage of e-government development. Smith (2001) has specifically developed criteria to evaluate government websites in New Zealand. Even though the criteria were applied in a developed country context, some of the criteria are applicable to the Indonesian context. Other scholars have also proposed a variety of criteria to evaluate each stage

of e-government websites development. However, the majority of previous studies show that criteria of e-government websites at an early stage merely present non transactional information through a single government website, while at a more advance stage of e-government websites have transactional information and other services.

While this study adopts the United Nations (2008) criteria for e-government benchmarking, further relevant criteria from published studies have been utilized, (e.g. Cursey & Norris, 2008; Huang, 2007; Irani, Al-Sebie, & Elliman, 2006; Kaaya, 2004; Layne & Lee, 2001; Pina, Torre, & Royo, 2010; Smith, 2001; United-Nation, 2003; United-Nations, 2008), to enhance and inform the evaluation. These are summarized in table 2 and discussed below:

No	Emergence	Enhance	Interactive	Transaction	Connected
1.	Single local government website	Local government has departmental websites	Security and privacy for interaction	Online form submission and applications	Central government Services can be obtained at local levels
2.	Basic information such as history, organization structure, vision and mission	Last updated websites between 1-3 months ago	Downloadable forms for manual completion	Secure sites and user passwords for transactions	State and local government system are connected
3.	Description of each departments are not available	Limited link to other government departments and institutions	Sophisticated interactive facilities such as Chat rooms, post comments area, and forums	Online payments	All horizontal departments are connected with a system
4.	Basic contact information such as telephone and email may or may not be provided	Downloadable documents such as publications and legislations	Interactive facilities are fully operational	24 hour services	Allow one stop shopping
5.	Link to other departments do not exist	Basic contact address such as telephone, e-mail, and guest books	Specialized database such as regulations database	Working database to support online transaction	Connections between government and all stakeholders

Table 2. Summarize criteria for e-government development

Emergence: Initially governments created websites to address demands from citizens, other stakeholders, and the media (Layne & Lee, 2001). This emergence of e-government usually starts with establishing an official website to promote their governance policies and disseminate general static information to citizens (United-Nations, 2008; Watson & Mundy, 2001). During the emerging period, online interaction with citizens may not exist nor links to other departments. Most government activities on the web are simply posting static information to let citizens know about them. Websites may describe the purposes and mission of the government (Smith, 2001).

Enhance: E-government systems have been broadened to a wider context by providing links to information archives (United-Nations, 2008). The archives might include forms, documents, reports, regulations and newsletters. The publication of such information can reduce government employees front office workloads such as citizens' inquiries related to government services and procedures (Layne & Lee, 2001). At this stage, the content of government websites mostly reflects current conditions. Determining whether website content is current, the page of the website should has been reviewed in the last three months Smith (2001).

Interactive: At this stage, other than providing downloadable forms, government also provides interactive media such as e-mail and online forums to enable citizens to communicated with government (United-Nations, 2008). According to Kaaya (2004) and Cursey and Norris (2008) government websites' interactivity might include more sophisticated features such as facilities for

feedback submission, two way interaction such as email, downloadable forms that can be submitted offline, and forums that allow citizens to post comments on the websites. Security passwords to access the forums or to post comments on the websites may also be required to guarantee privacy of the website visitors. This ability of government websites to be interactive may increase government responsiveness to citizens (Welch & Hinnant, 2003).

Transactional: The transaction stage is defined as "the point at which online technology ceases to be peripheral to the agency's activity" (Irani, et al., 2006). At this stage, e-government systems provide facilities for 24/7 citizen online payment systems (United-Nations, 2008). With two-way interaction, citizens are able to fill in forms and pay for ID (identification document) card applications, birth certificates, passports, and licence renewals. These types of forms may be available in specific databases that can be accessed easily by citizens. Payments are also available, supported by security, privacy, and confidentiality facilities (Kaaya, 2004). The availability of security facilities can help citizens make transactions securely through the websites.

Connected: At this stage, government organizations have been integrated vertically and horizontally and both back and front offices have also been integrated for e-participation and citizens' involvement in the decision making processes (United-Nations, 2008). This stage involves highly sophisticated e-government systems where all aspects of government organizations have been transformed to supportive technology. All government departments have been integrated vertically and horizontally which enables one-stop shop services (Layne & Lee, 2001) and connection between all stakeholders have also been established (United-Nations, 2008).

4   E-GOVERNMENT IN INDONESIAN CONTEXT

Indonesia has a unique local government power structure where the greatest autonomy is transferred to the second level of local government (regencies and cities) not to provincial levels (Depdagri, 2004). According to Regional Autonomy Law No. 32/2004, central government has granted full autonomy to the regencies and cities levels to manage their development (except law, monetary, defence, and foreign affairs). Based on this regulation, governments at provincial level do not have power to impose or mandate regencies or cities to adopt certain policies and regulations. Provincial levels function as coordinators and supervisors of the lower levels (regencies and cities). Regencies and cities have a direct relationship to central government and can adopt new policies from central government directly without involving the provincial levels.

The adoption of information technology by regency and city levels is the result of Indonesian central government regulation and policies. It was initiated when the central government enacted President Decree No. 50 in 2000 concerning Indonesia Telematic Coordination Team (TKTI) (Bapenas, 2003). The team coordinates the development of information and communication technology (ICT) in government and private sectors. In 2001, central government issued President Instruction No. 6/2001 concerning Indonesia's five-year National Information Communication and Technology Action Plan (Haryono & Widiwardono, 2003). It states that ICT should be used to empower citizens, increase their welfare, reduce poverty, and eliminate the digital divide.

In 2003, the Indonesian government launched Presidential Instruction No. 9/2003 to establish an ICT Coordinating Team (TKTI = *Tim Koordinasi Telematika Indonesia*). The team coordinates and encourages the development of ICT between government, business, and citizens. The team also encourages improving commitment of those actors to increase the use of ICT for better development. As a result, some local governments have started to adopt and implement ICT in their organizations during this period without standardization and coordination from central government.

Since 2000, all the above legislation has triggered government departments to use IT to support good governance. The legislation is crucial to the nation-wide development of future e-government in Indonesia because it is the legal basis for ICT infrastructure development. However, e-government in Indonesia is formally adopted when the government enacted Presidential Instruction No.3/2003 concerning the National Policy and Strategy of e-government implementation. The legislation is

followed by the launching of an e-government implementation Blue Print by the Minister of Information and Communication in 2004 (Depkominfo, 2004). The Blue Print provides objectives, guidelines, and standardization for local governments in implementing e-government.

The main objectives of the Presidential Instruction to adopt and implement e-government are to improve public services, establish interactive communication between government departments and businesses, enhance communication among government departments, improve efficiency and transparency, and facilitate communication between central and local governments. As a result, government institutions including local governments are able to improve their competitiveness in global development when they adopt and implement e-government. Citizens also have opportunities to participate in local development policies.

Since the launching of Presidential Instruction No.3/2003, many local governments have adopted and implemented e-government. The adoption is supported by the availability of information and communication infrastructure such as telephone lines and the Internet. The numbers of citizens in Indonesia who have access to the Internet and telephone lines has also increased. According to Asia World Stats (2010), Internet subscribers in Indonesia increased from 3.6 in 2005 to 11 in 2007 for every 100 people (30.000.000 users or about 12 % of Indonesian population), while telephone line subscribers, according to United Nations (2010), increased from 27 in 2005 to 43 in 2007 for every 100 people, but the overall percentage of Internet and telephone subscribers is low compared to other Asian developing countries such as Malaysia (65%), Philippines (24%), and Thailand (24%) (Internet-World-Stats, 2010).

5   METHODOLOGY

We used benchmarking analysis in evaluating the current status of Indonesian local e-government. Benchmarking analysis has been used intensively in evaluating government websites (e.g. Flak, Olsen, & Wolcott, 2005; Graafland-Essers & Ettedgui, 2003; Wauters, 2006). Benchmarking analysis enables us to compare individual criteria on a large number of websites by clustering them into certain groups using website content information (Flak, et al., 2005; Mosse & Whitley, 2009). In this study, benchmarking analysis assisted us in clustering local government websites according to the United Nations (2008) e-government evolution model based on the criteria in table 2.

The list of regencies and cities was obtained from the Indonesia Ministry of Internal Affairs (Depdagri, 2010). In total there are 489 regencies and cities found in 33 Indonesia provinces and they were evaluated during data collection from early March to end of May 2011. During the assessment all websites were checked several times to capture the most current information and services. The list consisted of all regencies and cities both online and without websites. However, new regencies and cities websites might have been constructed during the period of the study and therefore, the non-websites regencies or cities in the Ministry list were re-verified to locate any possible new websites.

We then evaluated each regency or city official website based on the United Nations (2008) five stages of e-government evolution. A local e-government is classified into an emerging stage when it has a formal website with one or all criteria under emergence stage (see table 2). For the next step, a regency or city was classified into the enhanced stage when they have at least three or more the first stage criteria plus minimum of 3 out of 5 criteria under the enhanced stage. But the regency or city websites were classified as in the emergence stage if it has less than 3 enhanced stage criteria. The same procedure was applied to the next stage classification. The evaluation examined the same functionalities on all regencies or cities official websites to maintain consistency (United-Nations, 2008). The result of the assessment and verification is a table which consisted of all local government names and websites with their e-government stage evaluation results. However, due to space limitation, the results are grouped into provinces instead of individual local government e-government websites (table 3).

6   FINDINGS

From the 489 local governments we examined, 424 local governments have websites of which 353 are accessible. Another 74 websites were offline and 62 local governments did not have websites at the time of data collection. Offline is a condition where a local government has an official website but it could not be accessed at the time of the study. Based on our analysis of the 353 active local government websites, using criteria from table 2, we clustered Indonesian local e-government status into four stages. There was no local government found to have achieved the connected stage. The results are depicted in table 3.

No	Provinces	Number of Local Governments	Stage of Local E-Government Development Status			
			Emerging	Enhance	Interactive	Transaction
1	Aceh	16	10	2	4	-
2	Sumut	19	17	2	-	-
3	Sumbar	15	6	6	3	-
4	Riau	7	3	4	-	-
5	Jambi	10	4	6	-	-
6	Sumsel	11	7	4	-	-
7	Bengkulu	4	4		-	-
8	Lampung	9	4	4	1	-
9	Kep. Babel	5	1	3	1	-
10	Kep. Riau	6	3	2	1	-
11	Jakarta	5	3	2	-	-
12	Jawa Barat	26	4	9	13	-
13	Jawa Tengah	32	11	11	10	-
14	Yogyakarta	5	2	1	2	-
15	Jawa Timur	35	13	9	13	-
16	Banten	4	3	1	-	-
17	Bali	9	2	2	4	1
18	NTB	10	4	3	3	-
19	NTT	12	9	2	1	-
20	Kalbar	12	10	2	-	-
21	Kateng	12	9	3	-	-
22	Kalsel	10	7	2	1	-
23	Kaltim	11	6	3	2	-
24	Sulut	8	7	1	-	-
25	Sulteng	6	4	2	-	-
26	Sulsel	16	8	6	2	-
27	Sultenggara	4	3	1	-	-
28	Gorontalo	4	3	1	-	-
29	Sulbar	5	5	-	-	-
30	Maluku	4	2	2	-	-
31	Malut	2	1	1	-	-
32	Papua	15	14	1	-	-
33	Papua Barat	4	4	-	-	-
	Total	353	193	98	61	1

Table 3. Current local e-government status across Indonesian provinces

The findings show that even though the Indonesian government has formally launched regulations to adopt and implement e-government at local level in 2003, most local e-government (55%) is still at the emerging stage. A further 28% of the local e-governments have achieved an enhanced stage with only 17% progressing to interactive stage. One local e-government has achieved transaction stage but none has moved to final stage of e-government. Below we discuss each stage of local e-government benchmarking findings:

Emerging: Since most of the local e-governments (193 or 55%) are at the emerging stage, their websites merely present information related to government organizations and their activities, while information related to the type of services provided for citizens could not be found. The information

includes the history of the local government, their missions and visions, their organization structure, what they currently do, and some announcements particularly related to auctions.

However, not all of the information on the websites can be accessed or is available. Sometimes there are folders on the sites but no information inside the folders, such as Melawai and South Aceh regency websites. Some of the local government websites have not been updated in the last few months. There are also local government websites that have not been updated for more than a year, such as Kubu Raya and Tabalong regencies, and City of Singkawang. Since they are at the emerging stage, they also lack the capacity to manage their websites and provide the correct contact address to citizens, for example the local government of Bengkayang regency in West Kalimantan province provides a contact email address for citizens inquiries with an email address "*info[at]bengkayangkab.go.id*" instead of *info@bengkayangkab.go.id* .

Enhance: At the enhanced stage, 98 (28%) of the local e-governments have provided a wide range of information related to services provided, links to other departments and institutions, and downloadable documents such as regulations, local government annual reports, and announcements. However, most of the local government websites only provide downloadable regulations and announcements, such as auctions and recruitments. A few local government websites provide information about their annual reports, regional statistical information and detailed information on how to obtain services that can reduce front office workload as stated by Layne and Lee (2001).

Local government at this stage also provide links and information to departments within their organizations. For example, Kudus and Trenggalek regencies provide information on each district within their regions. Regional statistical information such as demographic and natural resources is common on their websites. Information on how to obtain particular services, such as licences, is also available but there are no forms that can be downloaded. However, this type of information can at least help citizens to prepare documents needed in obtaining a licence permit.

Governments can also reduce their burden in response to citizen's inquiries related to regulations, statistics, and obtaining licence information. Local governments at this stage have provided basic interactive facilities for citizens' interaction such as telephone, e-mail or guest book. However, some of the comments of the guestbook have not been updated for a considerable time, for example Kutai Barat regency guestbook was last updated in May 2010.

Interactive: Other than providing downloadable documents and information, most of the 61 local governments at the interactive stage of e-government have provided more sophisticated interactive facilities such as discussion forums, suggestion and complaint forums, chat rooms, virtual community groups, an area to post comments and an SMS centre to allow citizens to give feedback to the governments regarding their policies and services provisions. For example, Probolinggo regency provides an online chatting forum with front line government employees. This government provides opportunities for citizens to discuss regional development, policies, and services issues to improve government services. The government also provides space for certain groups of virtual communities such as Probolinggo online business community and Cyber Village community. Meanwhile, Banyuwangi regency website allows citizens to post their criticism regarding their government policies and services through a criticisms forum provided on the website. The government clearly states on their website that citizens' feedback about their service provision is critically important for improvement.

However, some regencies do not manage the interactive facilities effectively; for example Ngawi regency have not utilized their discussion forum since June 2010. Similarly, Kebumen regency forum was last used in July 2009, while Yogyakarta city forum and blog cannot be accessed and their guest book was last used in December 2009. Regarding downloadable forms, only a few local governments provide a variety of forms, for example the city of Yogyakarta and Demak regency, which can be used to apply for permits, birth certificates, job and ID applications through manual mechanisms. While other local governments only provide one or two forms limited to certain services such as forms for licence applications.

Some local government websites such as Tulungaggung, Madiun, and Sidoarjo regencies have specialized databases such as JDIH (law and regulation information and documentation network) which is used to gather the information and documents related to central and local government regulation and law. Other local government websites, such as Bandung and Karangasem regencies, also have databases which gather incoming messages from citizens. This information is used by the government for decision making related to local development strategies.

Transaction: Only Denpasar city can be categorized as a local government that has moved to the transaction stage of e-government development. A government at the transaction stage of e-government is able to provide 24/7 online services including online payments. Even though Denpasar city is categorized at this stage, the only service that seems able to be accessible online and has online payment systems is ID renewals. No other services are provided online. The website also allows citizens to track bill payments such as water bills. A variety of forms are also available for citizens that can be used and submitted online.

7   DISCUSSION

The findings raise an important question on the success of Indonesian government policy for local e-government implementation since it was formally introduced almost a decade ago. Most local e-government is still at an emerging stage merely showing websites, and some websites are not managed and maintained according to e-government blue-prints (standardizations) (Depkominfo, 2004). For example, all local government websites should be managed by the Department of Communication and Information Technology of a local government, but in reality some local government websites are managed by different departments such as Regional Secretary Office (SEKDA) and Department of Regional Development (BAPEDA). There are also government websites managed and maintained by private companies such as the city of Makassar and Enrekang regency websites. Furthermore, some local governments name their domain with "com" or "org" instead of "go id" (*go id* is the formal Indonesian government institutions domain name) as suggested by the blue print.

E-government benchmarking can be used for evaluating retrospective achievements and for setting directions or priorities (Heeks, 2006). These findings can assist the Indonesian government and policy makers to understand the current state of local e-government in Indonesia and formulate strategic decision making for future local e-government development. This can be done by reviewing previous policies and strategies in e-government implementation across regencies to avoid central government budget waste. In the last ten years of e-government implementation, the central government has invested more than a hundred trillion rupiah (about US$ 11billions) across regencies, cities, and departments (Falahuddin, 2011).

After more than 7 years since the Presidential Instruction No.3/2003 concerning the National Policy and Strategy of e-government implementation was launched, the findings reveal that most local governments have yet to move their e-government offerings to the transactional stage. E-government systems at emergence and enhanced stages might not be able to provide significant benefit to citizens because they do not allow citizens to make transactions through the system. At the same time the government cannot reduce cost and improve efficiency in services provision without improving the services offered.

In response to the findings, it is important for the Indonesian government to redesign policies and strategies regarding e-government implementation within local governments. The Indonesian government also needs to establish strong policies and regulations regarding e-government implementation. The central government might need to form a task force to monitor and evaluate the e-government implementation. An example of such a task force is the implementation of Tanzanian's Integrated Tax Administration (ITAX) (Schuppan, 2009). The Indonesian government might also apply strict budgeting rules to encourage local governments to proceed to higher levels of e-government systems development. This can be done by reducing or withdrawing funding that has been allocated to local government. This strategy has been successfully applied by the UK

government (D Griffin & Halpin, 2005). Otherwise, local government will lose the momentum of e-government implementation. There is also the risk that local governments that have implemented e-government already might have to start from the beginning due to the loss of infrastructure and human resources.

8   CONCLUSION AND FUTURE RESEARCH

In summary, this study shows that local e-government in Indonesia can only be grouped in four stages. Not all of the United Nations e-government stages have been attained in Indonesia. Our study has found that the highest stage of local e-government development in Indonesia is transactional, while most other local e-government is still at the emergence stage. Further local governments are at the enhanced and interactive stages while only one has achieved the transactional stage by providing 24/7 online transaction and payment, although even here the 24 hours online transaction is limited to one service.

Since most local e-governments are still at the emergence or enhanced staged, we also conclude that the Indonesian e-government has yet to make significant progress that allows local government and citizens to get tangible benefits such as management and administration efficiency, reducing government bureaucracy red-tape, offering online services, and providing one stop shops. It needs a concerted and coordinated approach from the Indonesian government to make e-government beneficial for both government and citizens.

Our benchmarking of Indonesian local e-government only uses online data from local government websites. Further research is needed to investigate e-government development using a more in depth evaluation within the government organizations. Further investigation is also required to understand why some local governments have yet to adopt functional websites despite policies and regulations to do so having been launched by the central government. Finally only one local government has achieved transactional level. As efficiency can be gained at this level, more research is needed to understand how other local governments can achieve this level of e-government. This study provides empirical evidence that could contribute to efficiency gains of the Indonesian government in e-government implementation in the future and potentially offer insights into local e-government in other developing countries.

References

Al-Haddad, S. A., Heyland, P., & Hubona, G. (2011). An Assessment Tool for E-Government System Performance: A Citizen-Centric Model. *AMCIS 2011 Proceedings - All Subbmissions. Paper 181*.

Bannister, F. (2007). The Curse of the Benchmark: an Assessment of the Validity and Value of E-Government Comparisons. *International Review of Administrative Sciences, 73*, 171-188.

Bapenas (2003). Kepres No. 50 Tahun 2000 Tentang Tim Koordinasi Telematika Indonesia. Retrieved from http://old.bappenas.go.id/index.php?module=ContentExpress&func=display&ceid=1131

Barnes, S., & Vidgen, R. (2000). WebQual: An Exploration of Web Site Quality. *Proceedings of the Eight European Conference on Information Systems, Viena 2000*.

Bastian (2003). Pekembangan E-Government di Indonesia. *Sinar Harapan*, from http://www.bappenas.go.id/node/48/1660/perkembangan-e-government-di-indonesia---oleh-bastian-/

Cursey, D., & Norris, D. F. (2008). Models of E-Government: Are They Correct? An Empirical Assessment. *Public Administration Review, 68*(3), 523-536.

Depdagri (2004). Penjelasan atas Undang Undang Republik Indonesia Nomor. 32 Tahun 2004. Retrieved from http://www.depdagri.go.id/media/documents/2004/10/15/Penjelasan_UU_No._32_Thn_2004.pdf

Depdagri (2010). Daftar Alamat Situs Web Pemerintah Daerah dan Kab/Kota Seluruh Indonesia. *Pusdatin Komtel Kemendagri*. Retrieved from http://www.depdagri.go.id/basis-data/2010/04/23/daftar-alamat-situs-web-pemda

Depkominfo (2004). Blue Print Sistem Aplikasi e-Government Retrieved 05 March, 2010, from http://www.aptel.depkominfo.go.id/download/BluePrint1.pdf

Economides, A. A., & Terzis, V. (2008). Evaluating Tax Sites: An Evaluation Framework and Its Application. *Electronic Government, an International Journal, 5*(3), 321-344.

Falahuddin, M. J. (2011). Mengapa e-Government Gagal Di Indonesia Retrieved from http://www.menpan.go.id/index.php/artikel-index/184-mengapa-e-government-gagal-di-indonesia

Flak, L. S., Olsen, D. H., & Wolcott, P. (2005). Local E-Government in Norway. *Scandinavian Journal of Information Systems, 17*(2), 41-84.

Gant, J. P., & Gant, D. B. (2002). Web Portal Functionality and State Government E-Service. *Proceeding of 35th Annual Hawaii International Conference on Systems Sciences, IEEE*, 1627-1636

Graafland-Essers, I., & Ettedgui, E. (2003). Benchmarking E-Government in Europe and the US. *Statistical Indicators Benchmarking in the Information Society*. Retrieved from http://www.mafhoum.com/press5/155T41.pdf

Grant, G. G. (2006). Developing a Generic Framework for E-Government. In M. G. Hunter & F. B. Tan (Eds.), *Advance Topic in Global Information Management* (Vol. 5): Idea Group Inc.

Griffin, D., Foster, A., & Halpin, E. (2004). Joined-Up e-Government: An Exploratory Study of UK Local Government Progress. *Journal of Information Science and Technology, 1*(2), 58-83.

Griffin, D., & Halpin, E. (2005). An Exploratory Evaluation of UK Local e-Government From an Accountability Perspective. *The Electronic Journal of e-Government, 3*(1), 13-28.

Haryono, T., & Widiwardono, Y. K. (2003). Current Status and Issues of E-Government in Indonesia. Retrieved 08 April 2010, from Association of Southeast Asian Nations: http://www.aseansec.org/13757.htm.

Heeks, R. (2006). iGovernment: Benchmarking E-Government: Improving the National and International Measurement, Evaluation and Comparison of E-Government, Working Paper Series, Paper Number 18. *Development Informatics Group*. Retrieved from http://www.oecd.org/dataoecd/45/19/38404076.pdf

Henriksson, A., Yi, Y., Frost, B., & Middleton, M. (2006). Evaluation Instrument for E-Government Websites. Retrieved 30 Juni 2011: http://eprints.qut.edu.au/3113/1/3113.pdf

Huang, Z. (2007). A Comprehensive Analysis of U.S. Counties' E-Government Portals: Development Status and Functionalities *European Journal of Information Systems, 16*(2), 149-164.

Internet-World-Stats (2010). Asia Internet Usage and Population. *Online at :* http://www.internetworldstats.com/stats3.htm#asia. *Accessed on 06 April 2010*.

Irani, Z., Al-Sebie, M., & Elliman, T. (2006). Transaction Stage of E-Government Systems: Identification of Its Location & Importance. *Proceeding of 39 Hawai International Conference on Systems Science, IEE*, 1-9.

Jaeger, P. T. (2006). Assessing Section 508 Compliance on Federal E-government Website: A Multi-Method, User Centred Evaluation of Accessibility for Persons with Disabilities. *Government Information Quarterly, 23*(169-190), 169.

Janssen, M., & Veenstra, A. F. v. (2005). Stages of Growth in E-Government: An Architectural Approach. *Journal of E-Government, 3*(4), 193-200.

Kaaya, J. (2004). Implementing E-Government Services in East Africa: Assessing Status Through Content Analysis of Government Websites. *Electronic Journal of E-Government, 2*(1), 39-54.

Kaylor, C. R. D. V. (2001). Gauging e-government: A report on implementing services among American cities. *Government Information Quarterly, 18*(4), 293.

Klievink, B., & Janssen, M. (2009). Realizing Joined-up Government - Dynamic Capabilities and Stages Model for Transformation. *Government Information Quarterly, 26*, 275-284.

Kunstelj, M., & Vintar, M. (2004). Evaluating the Progress of E-Government Development: A Critical Analysis. *Information Polity, 9*, 131-148.

Kuschu, I., & Kuscu, M. (2003). From E-government to M-government: Facing the Inevitable. *Proceeding of 3rd European Conference on E-government*.

Layne, K., & Lee, J. (2001). Developing fully functional E-government: A four stage model. *Government Information Quarterly, 18*(2), 122-136.

Lee, S., M, Tan, X., & Trimi, S. (2005). Current Practices of Leading E-Government Countries. *Communication of the ACM, 48*(10), 99-104.

Lenk, K., & Traounmuller, R. (2002). Electronic Government: Where are We Heading? *Proceeding of the First International Conference EGOV 2002, Aix-en-Provence*, 1-9.

Moon, M. J. (2002). The Evolution of E-Government Among Municipalities: Rhetoric or Reality? *Public Administration Review, 62*(4), 424-433.

Mosse, B., & Whitley, E. A. (2009). Critically Classifying: UK E-Government Website Benchmarking and the Recasting of the Citizens as Customer *Information Systems, 19*, 149-173.

Panoupoulo, E., Tambouris, E., & Tarabanis, K. (2008). A Framework For Evaluating Web Sites of Public Authorities. *Aslib Proceedings: New Information Perspectives, 60*(5), 517-546.

Pina, V., Torre, L., & Royo, S. (2010). Is E-Government Leading to more Accountable and Transparent Local Governments? An Overall View. *Financial Accountability and Management, 26*(1), 3-20.

Reddick, C. G. (2004). A two-stage model of e-government growth: Theories and empirical evidence for U.S. cities. *Government Information Quarterly, 21*(1), 51-64.

Schuppan, T. (2009). E-Government in Developing Countries: Experiences from sub-Saharan Africa. *Government Information Quarterly, 26*(1), 118-127.

Smith, A. G. (2001). Applying Evaluation Criteria to New Zealand Government Websites. *International Journal of Information Management, 21*, 137-149.

United-Nation (2003). *Benchmarking E-Government: A Global Perspective, Assessing the Progress of the UN Members States*.

United-Nations (2008). UN E-Government Survey 2008 : From E-Government to Connect Governance. Retrieved 27 September 2010, from United Nations: http://unpan1.un.org/intradoc/groups/public/documents/un/unpan028607.pdf

United-Nations (2010). UNdata: a World of Information. Retrieved 11 April 2010, from United Nations: http://data.un.org/CountryProfile.aspx?crName=Indonesia

Wagner, C., Cheung, K., & Lee, F. (2003). Enhancing E-Government in Developing Countries: Managing Knowledge Through Virtual Communities. *EJISDC, 14*(4), 1-20.

Wang, L., Bretschneider, S., & Gant, J. (2005). Evaluating Web-based E-Government Services with a Citizens-Centric Approach. *Proceedings of 38th Hawaii International Conference on System Science-2005*, 1-10.

Watson, R. T., & Mundy, B. (2001). A Strategy Perspective of Electronic Democracy. *Communication of the ACM, 44*(1), 27-30.

Wauters, P. (2006). Benchmarking E-Government Policy Within The e-Europe Programme. *Aslib Proceedings: New Information Perspectives, 58*(5), 389-403.

Welch, E. W., & Hinnant, C. C. (2003). Internet Use, Transparency, and Interactivity Effect on Trust in E-Government. *Proceedings of the 36th Hawaii International Conference on System Sciences - 2003*, 1-7.