

PERFORMANCE EVALUATION OF INDONESIAN LOCAL GOVERNMENT WEBSITE: ANALYSIS OF WEB CONTENT, TRAFFIC AND WEBMETRIC

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ABSTRACT

Digital divide in the parameter occurrence of inbound links, a webpage or document richness, and web traffic on web governments in Java Out Java. Local web government have affected by the popularity of the web document richness not by inbound links, traffic or information richness.

KEYWORDS

E-government, Web Popularity, Webmetrics, Digital Divide

1. INTRODUCTION

Indonesia is a big country which has area of 1,904,556 kilometer square and consists of 17,504 islands. Amount of 9634 among the islands are unnamed yet (Ministry of Home Affairs 2004). Indonesian government region includes 33 provinces, 349 regencies, 91 municipalities, 5263 sub-districts, 72440 villages (Permendagri No. 18 in 2005). Until now, there are relatively not yet available details and complete data about the number of district area of level I, II, III, as well as the number of the villages that has already a website. The number of population of Indonesia is 238,452,952 peoples that is the big four country in the world. Such geographic and demographic data become the potential and challenges in the era of globalization and information, especially how to integrate the areas with e-government through information technology-which is a type of technology, that drives globalization.

In the era of globalization there are various emerging terms or new concepts, especially in economic activities both at the macroeconomic level and the micro economy. Even the new concepts led to the new "theories" which "complete", "dispute" or even "replace" some "old" concepts or theories. Some examples of these concepts are the digital economy, economics of the internet, knowledge-based economy, e-commerce, e-marketing, e-business, e-finance, e-banking, e-money, digital cash, and less-cash society, and e-government. All new concepts are related to the development and application of Information and Communication Technology (ICT) in various economic sectors including the last terminology related to government sector.

The development and implementation of e-Government depend on the rate of information technology usage by community. If the public have less literate on information technology then the utilization of information technology in government sector would not be effective. Nowadays some people have started to use IT properly, but we don't know yet the rest of them weather have properly IT literate. Table 1 shows the level of penetration and adoption of ICT in Indonesia for the year 2007.

Table 1. Percentage of ICT Penetration in Indonesia

Indicators	E-government	Asia Rate	World Rate
Telephone	34,87	44,92	60,04
Cellular Mobile	28,30	29,28	40,91
Main Telephone	6,57	15,81	19,39
Internet users	7,18	11,57	17,39
Broadband subscriber	0,05	2,71	4,30

Source: International Communication Union (2007)

The lag of ICT penetration of government officer will impact on public services. E-government Readiness Index (EGRI) is one of indicators of lag of government officer in development and implementation of ICT based e-government to support the public services.

The EGRI measurement includes web measure index, telecommunication infrastructure index and human capital index. The calculation of first component depends on result of some Indonesian e-government websites include the official web site of president, vice president, ministers etc (performed by experts from a survey institute). Second component utilizes six indicators, such as PCs/1000 persons, Internet users/1000 persons; telephone lines/1000 persons, online population; mobile phones/1000 persons; and TVs/1000 persons. The source data of such indicators can be accessed from website “International Telecommunication Union (ITU)”. The last component uses Adult literacy index and gross enrolment index.

Now, we look the position of e-government in Indonesia compare to other ASEAN countries. As we predict, United State is in the first position, as well Korean and Singapore as Asian countries in top ten (in place 5 and 7 respectively of year 2005). Following table is the position of ASEAN countries in EGRI rank.

Table 2 E-Government Readiness Index in ASEAN Countries

No.	Country	E-Governance Readiness Ranking		
		2004	2005	2008
1.	Singapore	8	7	23
2.	Philippine	47	41	66
3.	Malaysia	42	43	34
4.	Thailand	50	46	64
5.	<i>E-government</i> Indonesia	85	96	106
6.	Brunei	63	73	87
7.	Vietnam	112	105	91
8.	Cambodian	129	128	139
9.	Myanmar	123	129	144
10.	East Timor	174	144	155
11.	Laos	144	147	156

Source: UN-EGovernment Survey 2008

Table shows that Indonesia e-government position is relatively declined from year 2004-2008, meanwhile Malaysia, Vietnam are increased their ranking. The position of Singapore is the top of the ASEAN countries. It indicates the development of e-government of such three countries is already established and stable. Indonesia still faces the problem of population and demography to pursue the challenge of raising the EGRI rank position. Indonesia has to intensively work to integrate e-government through ICT.

Such declining of Indonesian e-government Readiness Index can also mean that other countries have faster acceleration in e-government implementation than Indonesia's. This condition is obviously worried, therefore some concrete actions should be conducted to improve the implementation of Indonesian e-government become faster and has better quality. The question is how Indonesian government's policy self and what factors are still hinder the implementation of e-government in Indonesia? What is the condition and performance of public services through public information services through the website of local governments? Is there any difference in performance of public services through local government websites?

Research answers some problems or challenges mentioned above, particularly to measure the performance of public information services, published in the local government websites. The focuses of research are the e-government content analysis, web metric analysis, traffic analysis, and HTML document validation. Object of research is the regional government websites at the three levels of government or the status of the provincial government, city governments, and local governments. The goal is to make local government websites ranking based on these parameters. Contributions are expected from the results of this research is to encourage the development of local government websites in Indonesia in order to improve the technical quality and the quality of public information to the public.

2. THEORITICAL CONSIDERATION

2.1. Definition and Feature of E-Government

The terminology of e-government, as presented in the UN report about the UN Global E-Readiness Reports, is "the use and implementation of ICT by the government to provide information and public services to the community". Therefore the purpose of e-government is to provide management of efficient government information to all citizens, giving services to a better society, and empowering communities through access to information and participation in public decision making (Curtin, 2006).

Ndou (2004) stated that the target of e-Government encompasses four main groups: citizens, businesses, governments (other governments and public agencies) and employees. The electronic transactions and interactions between government and each group constitute the e-Government web of relationships and the respective four main blocks of e-Government, that are Government to Citizens (G2C), Government to Business (G2B), Government to Government (G2G), and Government to Employees (G2E). Damodaran, John Nicholls, Alan Henney et al (2005) argue that the principles of e-Government need to be embedded into all local government processes, with clear relationships between services and initiatives and the e-Government agenda. Furthermore, to achieve the cultural and organizational change which is necessary for the benefits of e-Government to be fully realized, resources need to be made available for educating both staff and citizens in the concepts of e-Government.

E-government is clearly an important area of policy development and indeed has the potential to change the way in which the public sector operates, both internally and in relation to its customers. In Ireland, e-government has been the focus of significant attention as its importance for the public service modernization program as a whole has been recognized (Timonen, O'Donnell, and Humphreys, 2003). Cook (2004) has cited a report from the Momentum Research Group, sponsored by the National Information Consortium (NIC) which operates portals in several states, details the e-government needs, opinions, and preferences of 303 people and 103 businesses throughout the United States. In telephone interviews these two groups were asked many questions related to the use of government services, including their opinions about quality of service, confidence in results, funding for e-government, security of information, and whether they would like to find these services on state or local government Web sites.

At local government web site there are a number of criteria set by the Ministry of Communications and Information of the Republic of Indonesia (KOMINFO) in up guidebook local government web site. Criteria are given a description of the key features of the basic form of local government web site that consists of:

1. Function, accessibility, usability, web site information content-oriented local government public purposes, namely providing information and services desired by society. On this criterion emphasized the existence of anti discrimination for users, which means local government web site can be opened without facilities and the ability to distinguish a computer owned by the user. Government website design region is a professional, attractive and useful. News or articles devoted to the community should be presented in a clear and easily understood.
2. Cooperation; local government website should be working together to unify the vision and mission of government. All important government documents must have a URL (Uniform Resource Locator) is fixed, so the search engines (search engines) can connect to the desired information directly.
3. Effective content; Community users should be aware that certain information will be available at any local government sites. Users have a right to expect the contents of a local government Web site is current and accurate data, and expect news and new material is always presented.
4. Two-Way Communications; communications provided on government web sites in the form of two-way (Interactive). Local government website should provide users the opportunity to contact authorities, to explain their views, or create their own list of questions.
5. Evaluation of Success; Web sites of local government must have a system to evaluate success, and determine whether the website meets user needs. This means that sites web local governments should collect, at least, statistical numbers of users, visitors, number of page, the request is successful and unsuccessful, frequently visited pages and rarely visited, The main referral page. Additional information about who is using this site, the transfer rate data. Evaluation of four months is recommended.
6. Find Convenience Sites; the administration must promote the website and register to search engine. Public users may not be able to find a local government web site unless managers promote it and ensure that the search engine listing. And socialize through notices by the press, public relations and brochures.
7. Well-regulated services; Governments should use a trusted source; strategy clear, objective, and the target users, as well as future development strategy, including steps toward the center dynamic data from other digital media.

According to Damodaran, John Nicholls, Alan Henney et al (2005), there are also concerns about the impact of e-Government on the 'digital divide' in society between those who have access to digital technologies and those who do not. The problem of increased democratic participation requires that a substantial proportion of the community has direct access to e-Government via the Internet. A digital divide in the community raises two issues. The first is the practical one that if local authorities provide services via the Internet, they have to maintain dual systems: a conventional system for those not connected and an e-service for those who are, and

the cost of maintaining two systems can be prohibitive. The second problem is one of democratic equity. If those who are connected can obtain a more efficient service via e-Government, than those who are not connected, Those who have to rely on mobile services or town hall and public library facilities, are disadvantaged.

2.2. E-Government Growth in Indonesia

As mentioned by Harijadi (2004), National ICTs vision is “to bring into reality a modern information society, prosperous and high competitive, with strong supported by ICT”. To realized National ICTs Vision, the Government of Indonesia (GoI) has established The Ministry of Communication and Information (2001) that has responsibility to coordinate, formulating, and dissemination of national policies and strategies for ICTs development, encourage and stimulating the development of ICTs, increase the use of ICTs in everyday peoples’ live activities, and supervise the implementation of the National ICTs policy and development in Indonesia.

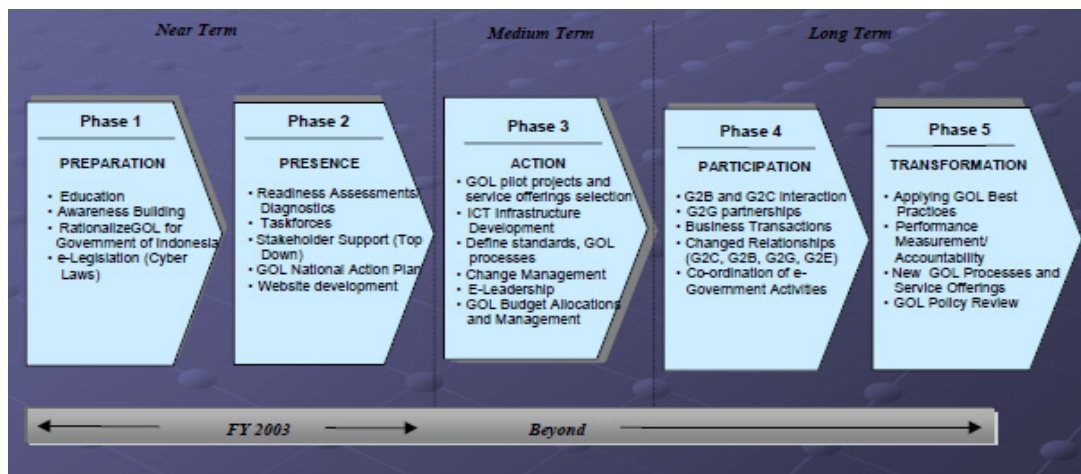


Figure 1. Indonesia's Road Map to E-Government (Harijadi, 2004)

As described in Harijadi and Satriya (2000), the e-government in Indonesia- like other countries, has knew the importance of building online services to be more transparently accessible by the public. The government has made several initiatives concerning to ICT policies, or referred to telematics on e-government. Various initiatives are designed to enhance the e-leadership in e-government and reform the telecommunications sector. Such initiatives include adoption of legislation regarding to e-government in order to affiliate e-government with the international community in the future.

As in Presidential Decree No. 5 of 2000, the Government has established the Coordination Team Telematics of E-government (TKTI), as a national task force to increase the use of electronic media to facilitate the functions of government, linkages, interactions, and transactions. TKTI also responsible for providing guidance and provide recommendations on how to make the development of ICT in e-government, including e-government itself. In April 2001, the government has issued Presidential Instruction No. 6 which provides guidelines for development and empowerment of ICT in the community. Presidential Instruction includes 75 programs or action plans which are classified into 4 categories i.e.: legal framework and policies, human resource capacity development, infrastructure, and applications on government and private sectors. Several action plans have been made by TKTI for following issues:

1. Policy reform and legal framework to support the development of ICT, including e-government.
2. Human resources capacity development to support ICT and e-government.
3. Accelerate the development of infrastructure to support ICT and e-Government applications through national and international partnerships.
4. Provide the development of useful e-government application.
5. Revitalization of e-Government portal.
6. Implementation of e-government strategy.
7. Preparing an action plan for e-government offices or agencies that are related.

2.3. E-Government Evaluation Model

Choudrie, Ghinea and Weerakkody (2004) has reported the results of an evaluative study of a cross-section of e-Government portals from these three perspectives, using a common set of performance metrics and Web diagnostic engines. Results show that not only are there wide variations in the spectrum of information and services provided by these portals, but that significant work still needs to be undertaken in order to make the portals examples of 'best practice' e-Government services.

Rating system consists of three types rating calculated and published separately by : E-Government Webmetrics Index, E-Government Readiness Index, and E-Government Satisfaction Index. EGWI using parameters or indicators that point to webmetrics inspired by the rating provided by rating agencies Webometrics and the University Website Popularity index from 4ICU. The parameters used consisted of the 3 parameters: Information richness, richness document, and website popularity. Results are measurement indicator use web crawlers that are designed and developed specifically. Each proficiency level in these indicators are then converted into a logarithmic number 1 for the highest score for each indicator. So that each site have indicator values range from 0 (lowest) to 1 (highest). The weight for each indicator in the same parameters are equal, thus the scores for the parameters can be calculated based on the arithmetic average of the score indicators.

EGRI measured by a specially designed questionnaire in accordance with the existing parameters in the E-Government Readiness ranking compiled by the Economist Unit Intellegent. Two parameters used in this ranking is connectivity & Infrastructure and government policy and vision. Results for rating each indicator were converted into logarithmic form in which the number 1 indicates the highest score for each indicator. The weight for each indicator in the same parameters are equal, thus the scores for the parameters can be calculated based on the arithmetic average of the indicator scores. EGSI using some parameters and indicators that refer to the E-Government Satisfaction Index from the American Customer Satisfaction Index developed by the University of Michigan, American Society for Quality and CFI Group. Response scale for each indicator (question) ranged from 0 (very dissatisfied) to 10 (very satisfied).

3. METHODOLOGY

This research is a preliminary study to determine the initial conditions of e-government implementation in Indonesian e-government. Research objects are websites of provincial governments, local governments and city governments which are registered the ministry of internal affair. Each site is observed and evaluated by using the research instrument specifically designed to measure the service performance of local government websites. Parameters used consisted of analysis content, traffic analysis, web metrics analysis, and HTML validation.

Content analysis uses indicators that include the availability of website features such as news, FAQ, number of public service, related content to e-government and so on. We use alexa (<http://www.alexacom>) for traffic analysis. The webmetric analysis includes the number of webpages indexed by google, yahoo, which tracked the number of documents in google. Web indexing by yahoo (<http://yahoom>) is used for inbound link. The reliability of website such as "error" and "warning" for the HTML script on each local government websites is evaluated by using HTML validator. Another attributes are the domain name of URL should follow the government regulation and the throughput of website loading web site. The technique of analysis is ranking each parameter. The test of parameter value distinguishes is based on levels of government and location. The results of this ranking will be a comparison (benchmark) for the crawler to be designed specifically for the ranking system of e-government in Indonesia.

4. RESULTS AND DISCUSSION

4.1. Content Analysis, Accessibility and Technical Aspect

Data was taken on March 26, 2010, there were 181 local government website in Indonesia, as many as 150 local government web or approximately 82.9% can be accessed, 17.1% or 31 local government web cannot be accessed when data is retrieved. Of the 181 local government website, 32 is the type of web for the provinces, 109 districts and the city web 40. While the area of local government are mostly located out Java that is 99 or about 54.75, the remaining 82 are in the island of Java which is 45.3%.

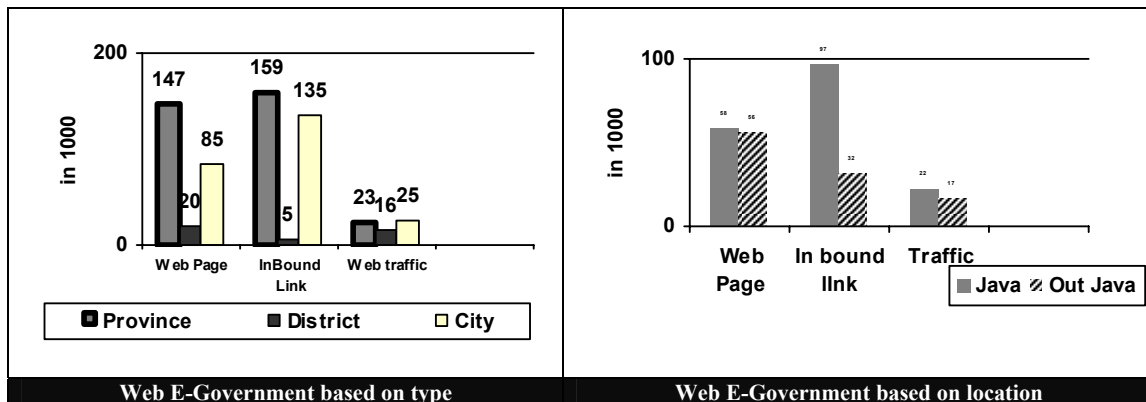
Content on the web shows most of the existing type of informational website that is 98.7% of the web 148. Web news is that there are 97.3% of 146, the organization structure of the web 110, or about 73.3%. For the web that provided most of the Frequently Answer and Question (FAQ) there are no FAQs in the amount of 94.7%,

availability of site map is also not widely available in the web administration, 74.7% of the data showed there were no web site map. Many regional promotions available on the web is a 64.1% local government or a number of web 116 from 150 available web accessible.

Total webpage relatively varied from a low of 3 to a high of as much 1.610.000 with the average 70.348.69. Theoretically and technically, the more the number of webpage, the higher the amount of information is uploaded to the website of the local government. Viewed from the local government level, the number of web pages (document richness) which is the province with the highest average of 1195.78, followed by the city of 1044.23, the last is kabupaten 139.97. Judging from the location, outside the regional government of Java has a number of documents that are less than in Java, which is 207.93 compared with 911.05. The relatively small differences indicate the existence of the digital divide between Java and outside Java as previously thought, but the information is structured in the form of a webpage should be arranged in a systematic, efficient, and effective so that the information on the website are well. Structuring this webpage management related knowledge as proposed by Wagner et al (2003), which states that “Another relatively simple knowledge management solution is the creation of “hard coded” (HTML) web pages, and database backed websites. Web pages written in HTML can be easily produced and hosted with little technology demand”. The statement relating to other aspects of the preparation of the information in the form of HTML should be in accordance with standards established-for example refers to the W3C. Unfortunately, compliance with HTML standards, as measured by the HTML validator, indicates that the website in the Indonesian government still contain the number of "errors" and "warning" which is relatively high, with an average 182.69 for "error" and 45.25 to "warning." One interpretation of these indications is the understanding of the format and standard HTML web admin among governments still need to be improved.

4.2. Information Richness, Document Richness, and Popularity

Inbound links are links from other websites towards a website. If a web site is assumed as A and B. A website has links to website B, then B can be said that the site has inbound links from site A. The number of inbound links that are owned by the popularity of a website becomes the value or worth of the website. Inbound links are important factors in SEO (Search Engine Optimization) because it is one of the factors that affect website rankings on search engines. Reputation links obtained from the quality of inbound links add value to search engines to rank websites. quality inbound links is the relevance of their content partners with a website link. When a site has inbound links from other websites with similar or related content, so the website can be said to have quality inbound links. The greater the relevancy, the higher is the quality possessed.



Seen from the picture above that the province has a web page inbound links and the highest, while web traffic is highest in the region of the city government. While web government in Java has inbound links, web pages and the traffic is higher than out Java. Same as parameter document richness that occur in the digital divide between websitein Java and out Java.

4.3. Ranking Analisis

Statistical analysis indicated that the document traffic correlated with richness, but was not correlated with the number of webpage links and inbound. These findings indicate that the local government website visitors to access the website to search for information contained in these documents in PDF format, doc, or other file formats. Visibility parameters, as measured by inbound links is a measure of the popularity of a website, but the size is not quite encouraging visitors to access the website from external links. Indications are in accordance

with the concept of SPIR (Social Presence and Information Richness) that mentioned by Short et.al(1976), Walther(1992), Gunawardena(1995). An information system will be adopted by end users if the information system supported by a social community and has useful information for users. Walther (1992) also found that : previous interaction between communicators influenced how people communicated online, possibility of future interaction influenced the degree to which people socially interacted online, the way users used emoticons also influenced interpersonal communication online.

Table 3. The Big Five Website Government for Web Page (Information Richness), Inbound-Link, Document Richness and Traffic

No	Website Government			
	WebPage (Information Richness)	Inbound-Link	Doc. Richness	Traffic
1	Central Kalimantan province	Bone District	Jakarta Province	South Jakarta City
2	Tomohon City	Jakarta Province	East Jakarta City	East Jakarta City
3	Central Java Province	Papua Province	West Jakarta City	North Jakarta City
4	Papua Province	Central Jakarta City	Central Jakarta City	Jakarta Province
5	Kebumen District	West Jakarta City	North Jakarta City	West Jakarta City

Website regional government in Indonesia was relatively popular compared to websites in other sectors, such as education or corporate sector. One measure is to rank from alexa.com traffic. This condition is suspected because of several factors. First, the Society has not been able to utilize existing information on local government websites for a number of inhibitors-such as Internet usage penetration is still low in Indonesia or the public Internet connection facilities are not evenly distributed in every region. Second, the information contained in the website is incomplete and not yet meet the needs of the community. This conjecture can be associated with the completeness of the website features a relatively low level. Most local governments in Indonesia website informational website that is not classified search allows customized information that is supported by the completeness of data and transaction information to the public interest. Much more emphasis on news and events or internal in character description information about the profile of local government. Local government website should provide useful information services with a high level of accuracy of the information for the public interest. One type of information is great potential for inclusion in local government websites in Indonesia are online permits or ID cards processing online population. By Henriksson et.al (2006) The user communicates electronically with the government agency, and the government agency responds electronically to the user. Services, transactions, or interactions take place in their entirety online. There must also be some kind of exchange that confirms the validity of the transaction.

Third, the popularity or level of regional governments that have low adoption websites are also associated with the dissemination or public education. However, this factor must also be offset by increased Internet penetration and availability of facilities or access to the internet connection is evenly distributed throughout the territory of Indonesia. The last factor here is the challenge in Indonesia if the Indonesian view of ICT density is still below the world average, Asian and ASEAN regional level. One of which can be done to increase the popularity of the website is to combine the local government or public information announcements between conventional media with web-based media. For example, the announcement can generally be delivered in the form of brochures, letters, or in other print media, but more details are presented on the website by its URL address listed in the print media. This simple way of force people who want more information to visit the government website.

5. SUMMARY AND IMPLICATION

Various challenges and barriers in Indonesia require an alternative solution can be based in e-government development in Indonesia in the future.

First, the problem of knowledge and skills of information technology use by employees or government agencies, a relatively low associated with socialization and training regarding the function and role of information technology as a tool or supporting media in carrying out the functions and tasks of the government apparatus. Effective training is still needed training need analysis stage, including the projected development of human resources in government institutions. Secondly it is necessary to enable the dissemination and training of e-government can be in accordance with the objectives and policies in the development of local government itself. Increasing human resource capacity needed to support the sustainability of e-government management, including sustainability and information updates its web content.

In addition, given the number and diversity of job functions and personnel in government agencies is needed is an innovative learning system that is characterized by mass, independent, interactive, independent of time and place, interesting and informative, as well as easy access materials. One alternative to such an innovative learning system is e-learning which can be accessed and utilized by the government apparatus, especially those assigned to maintain and manage the website or other Internet-based services. . Another problem that needs attention is the carrying capacity of infrastructure computer network or the Internet in government offices. These training activities were also associated with knowledge about the carrying capacity of computer networks and knowledge about the socio cultural community, including conditions of access and internet connections in government territory.

Second, low levels of ICT penetration and digital gap (digital divide) in community groups is a factor inhibiting the use of e-government for the benefit of society. In addition, the availability of access or internet connection in the area of governance, including perceptions of high cost of Internet connection be another inhibiting factor. One effort that could be done in an early stage is the formation of public awareness or concern regarding the function and benefits of the Internet. This effort could be done through public education about the role and functions of the Internet, including introducing e-government concept. Forming awareness (awareness) is an early stage in the process of adoption of Internet technologies (including e-government) that is expected to influence the decision of the community in using Internet-based public services provided by local governments.

Thirdly, training functions and benefits of e-government should be balanced with the enrichment of information (information richness) from a web-based government services that meet community needs and conditions. The need for public information itself will evolve and eventually the estuary is a government service demands increase. The diversity of educational levels and social strata of society-which in addition to encouraging the digital divide, are also demanding systems or methods of effective public education. Differences in scope and depth of educational materials should be considered when designing the syllabus and media education. Various types of training or media-such as conventional training schedule, distribution of brochures, meeting the target speech in a particular community groups, media, computer-based teaching, to the e-learning model, should be developed and implemented in accordance with the characteristic of the target communities.

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