

# Digital Divide between Indonesian Provincial Governance Based on Web Evaluation

Ivan Maurits

Department of Computer Engineering  
Gunadarma University  
Depok, Indonesia  
ivan\_maurits@staff.gunadarma.ac.id

Dessy Wulandari Asfary Putri

Department of Informatics Management  
Gunadarma University  
Depok, Indonesia  
dessy\_wap@staff.gunadarma.ac.id

Muhammad Achsan Isa Al Anshori

Department of Informatics Management  
Gunadarma University  
Depok, Indonesia  
achsan@staff.gunadarma.ac.id

Abdus Syakur

Department of Informatics Engineering  
Gunadarma University  
Depok, Indonesia  
syakur@staff.gunadarma.ac.id

**Abstract**—All provinces in Indonesia have implemented websites as the information and communication media for public. The number of provinces involved as the samples in this research are 33 provinces. The URL name structure and minimal content of the websites have been in accordance with rules and policies stated by the government. The ideal numbers of features are 18 for each websites. However, based on the observation toward the ideal number of the features, it is found that most of the websites have not fulfilled the amount yet. Province websites are rarely accessed by visitors. They prefer visiting the websites of companies or education institutions. The popularity of the websites is measured based on Alexa Global Traffic Rank, the number of referring domain, and external back link. The research also reveals that there is a digital divide between provinces in Java island and other islands based on the discriminant analysis using four independent variables, namely feature index, total backlink, global traffic rank, and total webpage.

**Keywords**—geographical, indonesian, provincial, digital

## I. Introduction

The total land area of Indonesia is 1.904.556 km<sup>2</sup>. It consists of 17504 islands and 9634 of them have not got the names yet. Indonesia is the fourth most populous country in the world with a population of 238,452,952. These demographical and geographical data denote potentials as well as challenges in the globalization and information era. This is due to the fact that information technology can be used as a means to integrate the spreading islands. However, such kind of technology has not been optimized by the Indonesian government yet. Provincial governments, districts, and cities located outside the island of Java relatively have less information as well as services on their websites [1].

The development of e-government must be in accordance with the readiness and constraints of under-developing

countries, especially Indonesia. The constraints encountered can be in the forms computer networks and database communications that have not been equally implemented by all provinces in Indonesia. This condition will bring into digital divide in the use of information and communication technology by certain group of people in different areas. Indonesian government must be able to find the solutions of the problems, so that the e-government will be successfully implemented. The success of the e-government implementation in Indonesia will result in the betterment of public sector services.

One of the media that can be used to improve the public service quality is websites. This can be used by the local government as the information and communication media as well as transactions between government and public. The digital government is a global phenomenon and public servants around the world are adopting novel ways to leverage IT to better serve their constituents [2]. There remains significant variation in the extent to which county governments delivers Internet-based services and information to their citizens [3].

Indonesia is the world's largest archipelago with more than 17.000 islands that consists of 33 provinces, 399 districts, and 98 municipalities. Having areas that are located separately and various societies, Indonesia is able to utilize ICT as the alternatives to integrate all administrative areas. Using of ICTs, and particularly the Internet, as a tool to achieve better government [4].

Indonesia is still left behind in the development of e-government comparing to other countries. Since 2003 some e-government policies has been issued by the government but in facts year by year, the global rank of e-government readiness as well as regional rank of Indonesia still in low rank [5]. Website of local government in Indonesia has not provided

good service for the four types of services: the FAQ, electronic procurement, site map, and geographical information [1]. The digital divide between Java and outside Java is still significant relative to the information richness and popularity of the web [6].

## II. Theoretical Background

Over the past ten years the dramatic advances made in information and communications technology (ICT) have transformed much of the world into a digitally interconnected community that is increasingly functioning on a “365/24/7” basis [7]. But, It is not difficult for people in developed countries to imagine a situation in which all interaction with government can be done through one counter 24 hours a day, 7 days a week, without waiting in lines. However to achieve this same level of efficiency and flexibility for developing countries is going to be difficult [8]. According to Henry, although the link between technology, growth and poverty reduction is not as empirically solid as one might expect, the fact remains that technologically advanced countries have higher incomes [26].

The e-Gov field (also called Electronic Government, Digital Government, Electronic Governance, and similar names) emerged in the late 1990’s [9]. According to Worldbank definition, E-Government refers to the use by government agencies of information technologies (such as Wide Area Networks, the Internet, and mobile computing) that have the ability to transform relations with citizens, businesses, and other arms of government. ICTs—with the exception of the institutional efficiency and sustainability factor—have a positive relationship with governance indicators. ICTs therefore, have the potential to promote good governance [10]. The Stages of E-Government are (1) Emerging: an official government online presence is established; (2) Enhanced: Government sites increase; information becomes more dynamic; (3) Interactive: Users can download forms, e-mail officials and interact through the web; (4) Transactional: Users can actually pay for services and other transactions online; and (5) Seamless: Full integration of e-services across administrative boundaries [7].

The internet provides a powerful tool for reinventing local government [11]. It encourages transformation from the traditional bureaucratic paradigm, which emphasizes standardization, departmentalization, and operational cost-efficiency, to the “e-government” paradigm, which emphasizes coordinated network building, external collaboration, and customer services. Websites become an important tool that the government used to market their institution to prospective customers and, to provide government information and services available on-line [12]. Virtually all government services can be classified under one of three fundamental categories: informational, interactive and transactional [7]. There are some impediments to the improvement of the usability of government websites, such as lack of testing and monitoring, lack of involvement of end-users, lack of a clear framework of collaboration and

coordination, poor standardization, and lack of trust/satisfaction [13].

Anything available on an e-government site can be taken down or altered with little evidence that corrections were made, there may be a reduced effort to perform duties correctly [14]. There are a number of factors that may help to explain the variation of county government websites. This investigation considered two of those factors, income and population, and found that a significant correlation exists between each of these factors and e-government involvement [3]. E-governance is more than just a government website on the Internet [8]. Adoption of e-government portals was highly associated with certain social and economic factors [15]. Government portal websites are the core components of e-Government because it is a platform integrating different government resources [16].

Website popularity does not depend on information richness and number of web features. The amount of information and the number of service features have not been able to increase the popularity of the provinces website in Indonesia [6]. There were no significant improvements on information richness and website features in Indonesia local government website. This indicates that the most websites of local governments in Indonesia have not been fully utilized for public services [1]. The citizen’s higher perception of usefulness, ease of use, quality and trust of e-Government services directly enhanced the level of adoption of e-Government [17].

The assessment toward the utilization of websites covers all aspects and attributes that might result in different judgments amongst experts and researchers. However, the different point of view is still focused on the different categories of the attributes and parameters used. One of the aspects used to assess the website usability is how the content of the websites provides valuable information to the users [18]. Criteria or attributes to assess websites managed by the government in 6 categories, namely (1) Security and Privacy; (2) Usability; (3) Content; (4) Services; (5) Citizen Participation; and (6) Features [19].

## III. Methodology

The procedures and models used in this research referred to the research done by [6] and [1] that employed webmetrics and website evaluation approach toward 33 province websites in Indonesia. Two other variables are employed in this research namely total backlink and referring domain. The province websites used as samples are 7 in which located in Java and Bali. They are assumed as the provinces that have higher economic conditions and advancement in technology than the 26 other provinces.

The website features were evaluated by 4 researchers using standard worksheet containing ideal features from the government websites that referred to the reasearch done by Silfianti and Suhatri [6]. The number of features observed were 19 features. One feature was added in this research

namely the availability of GIS-based map. The richness of information was measured based on the number of webpages indexed in google search engine with syntax: “site:url address“. The range of the richness was measured in 0 which means no feature and 1 which means there is a feature in the website. At first, the total scores were counted for each website, then the feature index was obtained by dividing score total in each website province with the highest score of the province website.

The measurement was done in the same time to avoid the fluctuation of the query result in the search engine. The data were retrieved in the end of December 2012. The data collected were the number of webpages, alexa traffic, and the evaluation toward website features. The popularity of the websites is measured using Alexa Traffic Rank. Other variables are total backlink that measured using ahrefs.com. Web metric differences between Java and outside-Java tested by independent sample t test. Discriminant analysis used for classification prediction based on feature index, webpage number, global traffic rank, and total backlink.

## iv. Result and Discussion

### A. Variability of Web Feature

All provinces in Indonesia have implemented websites with the URL names which refer to the government regulations. The name of the URL must include the abbreviation of the province and combined with “prov” such as [www.jabarprov.go.id](http://www.jabarprov.go.id). That regulation is not applied equally for Jakarta as the capital city of Indonesia. The URL name of Jakarta Special Province is [www.jakarta.go.id](http://www.jakarta.go.id). The way of naming URL is regulated in the Decree of Minister of Communication and Informatics, number: 28/PER/M.KOMINFO/9/2006 about the use of domain name go.id for official websites of central and local governments.

The ministry of Informatics and Communication has determined specific criteria to evaluate the websites content of local government. One of the guidelines to evaluate is “Buku Panduan Pembangunan Situs Web Pemerintah Daerah Peserta USDRP (Urban Sector Development Reform Project)”. Referring to this book, every website must have “overview”, “organizational structure”, “geography”, “local map and resources”, “rules and policy of local government, and “news”. Beside those six minimal features, a website of local government must be able to interact with public through “discussion forum” and “guests”.

The observation toward local government website in this research covers web features, the number of webpage, and the popularity which are measured using alexa global rank and total backlink retrieved from SEO. The description of scores of each variable can be seen in the following table.

TABLE I Descriptive Statistics

	N	Min.	Max.	Mean	Std. Deviation
Global Rank	33	79416	12446673	1600597.24	2319450.709
Total Backlink	33	1340	37598	19389.91	6626.517
webpage	33	1270	7240000	562256.06	1662616.775
Feature Index	33	.0000	.8421	.618820	.1969427

The table above shows that provincial websites are not popular, incomplete features, inadequate information. The scores or information usability is not discussed in this research. The traffic does not depend on information richness and number of web features. There were differences in information richness and real traffic rank among the provinces outside Java with Java [6].

From 19 features that are observed, the highest three features are news, local government features, and link to other sites. The lowest features are FAQ and GIS. In overall, the websites features have not directed to the transactions and have not involved public participations. Most activities done by people in the websites include-either searching for relevant information or doing online transaction- online registration, online request, access to the database, downloading, proposing complaint, and others [20].

The number of features found in the websites has not reflected a guarantee that the websites are popular or frequently visited by public. One of the parameters to measure the popularity is the total backlink or global traffic rank using Majesticseo.com or alexa.com. The number of the contents that are measured based on webpage using google.com is not a guarantee that the number of the visits in the province websites will increase. This condition is described in the following figure.

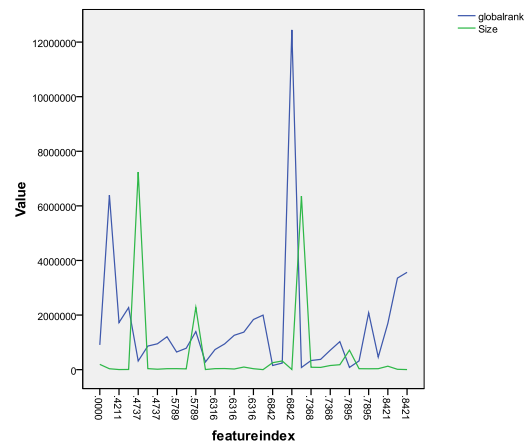


Figure 1. Global traffic rank and number of webpage

The above graphic shows that there is pattern that shows the correlation between the completeness of the features and the web popularity. The visit to the web is not caused by the completeness of the web, or in other words the popularity of the web is not caused by the completeness of the web. It is assumed that there are other factors, such as the usefulness of the information provided, and search engine friendliness. The

latter will make the information provided by the website is easy to be found using search engine by typing relevant keywords. However, based on the global rank or total backlink of the local government websites, it can be identified that in general the local government websites are rarely visited or not popular. This condition shows that the local government websites usability is still low. This result is in line with the research done by Harfoushi [13] who stated that government websites generally do not have a high level of usability, and that there is a lack of understanding of the needs and requirements of the end-users.

**B. Geographical Digital Divide**

The dichotomy between provinces located in Java and out of Java has become sensitive issue for the politicians. The polemic is usually directed to the economic divide between the two areas. Java islands are regarded as the central economy and modernizations. However, they have relatively lower economic condition the islands out of Java, although they have wider areas and abandon natural resources. The government has tried to decrease the divide and renew the telecommunication infrastructures so that this can cover thousands islands along the archipelago. For e-government to be effective within a nation, the necessary technological infrastructure must be present and provide service to all citizens [14].

Regardless of the perception of the dichotomy Java and outside of Java in politics or economy, this research is focused on the possible digital divide based on the evaluations toward provincial websites. In general the provincial websites in Java have more contents, traffic, and the higher completeness of the features than the websites of provinces out of Java. The difference on the total webpage and global traffic rank can be seen in the following figure.

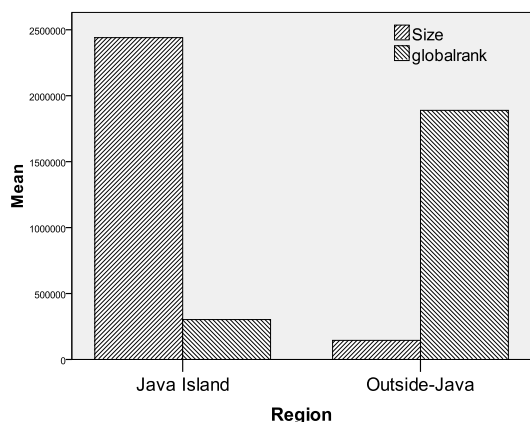


Figure 3. Differences of webpage and global traffic rank between regions Global traffic rank and total webpage can be easily identified as the predictors rather than two other variables called feature index and external backlink. The difference of the website evaluations between provinces in java and outside of Java is analyzed using t test.

The result of independent sample t test shows that statistically only the number of webpage (size) and Alexa

Global Rank which is different significantly. This regards that the variances that different: equal variances are assumed for size and equal variance is not assumed. The next analysis is to predict the divide between local government in Java and outside of Java based on discriminant analysis. To prove the digital divide, 4 parameters are employed. They are webpage (size), alexa global rank, total backlink, and feature index. The levels of predictions using discriminant analysis can be seen in the following table.

TABLE II Classification results of discriminat analysis<sup>a</sup>

	Region	Predicted Group Membership		Total
		1	2	
Original	Count 1	3	3	6
	2	1	26	27
	% 1	50.0	50.0	100.0
	2	3.7	96.3	100.0

a. 87.9% of original grouped cases correctly classified.

The result shows that the four variables are regarded as the predictors toward the locations of the local government, namely Java and outside of Java. The level of prediction is quite high, that is 87.9%. This means that digital divide is very high. The discriminating power can be put in order as the following: webpage number, global rank, backlink, and feature index. This result is line with Hermana and Silfianti who stated that there are digital divide between Java and outside Java for a webpage, inbound links and traffic [25].

The digital divide found in this research hopefully will be taken into considerations by the government so that such phenomenon can be decreased or eliminated. Indonesia needs strategic and integrative policies to improve their e-government system. The government should comprehend that digital divide is not just about the inequality between those who have access and those who do not, and therefore, providing access is not the only policy needed to close the digital divide [21]. The latest development shows that the Indonesians are now quite literate to the internet. This condition is supported by the availability of the telecommunication infrastructures which gets better. In such conditions, the technical skills of the website administrator must be improved.

E-Government adoption is a function of financial, technical, and human resources. Two factors that may result in the digital divide are human resource competence and infrastructures of telecommunications, particularly the internet accessibility to public [22]. This is in line with the statement that the success of e-initiatives depends largely on human skills and capabilities [23]. Related with internet access, e-government will only be successful when access to the Internet is widespread and available to every citizen [24]. The challenge faced by the government is the width of Indonesia and the number populations with different levels of



educations. This will be a further homework for the Indonesian government.

## v. Conclusion

The popularity and content number of the provincial websites in Indonesia are still low based on global traffic rank, total webpage, and total backlink. From content point of view, the websites features have not been optimal, although they have fulfilled the minimum criteria determined by the government. Technically, the transaction stage in the context of e-government development has not been fully achieved. The interaction and two-way communication between government and public were also rarely implemented in the provincial websites.

Provincial websites in Java island show higher webpages, traffic, feature, and total backlink than those in other islands. The digital divide needs government attention particularly the the human resource competence of the local province, the distribution of telecommunication infrastructures and internet accessibility enabling to cover all areas within Indonesia. The enrichment of the features must take into account by the website managers so that the transactions and website usability of the provincial websites can be improved in the future.

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