Evaluating Local Government Website Using a Synthetic Website Evaluation Model

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Abstract

One of the main strands in e-government research focuses on evaluating the government website. Previous studies have developed several models of government website evaluation. Unfortunately, that rich exploration of the government's website study seems to be ignored in the Indonesian e-government literature. Against that backdrop, this study formulated a synthetic model of government' website evaluation based on previous models developed by other scholars. It deployed them to assess ten local government websites (Municipality/Regency) in East Kalimantan. The model consists of two broad dimensions: technical and democratic deliberation. On the technical dimension, by using the SortSite 5.3.5. software, it is found that the local governments' website performs relatively low on accessibility and errors on four metrics evaluated by the software. On the other side, on the democratic deliberation dimension, local government websites in East Kalimantan have performed relatively well in fulfilling the minimum of the democratic principle. We call it minimum because the websites have provided the user with basic information and several channels to interact with the officials.

Keywords: Website Evaluation Model, Local Government Website, Indonesia.

Introduction

The idea of e-government is closely related to the principles of democracy. E-government is an integral part of Good Governance that aims to create a transparent, accountable, effective, honest government and support citizen participation in the development process (United Nations, 2018). It is widely believed that the implementation of e-government can help the government achieve reasonable governance goals.

With that in mind, e-government research has become one of the critical topics in academic literature. It has grown to explore many facets of the subject, such as discussion about critical factors in determining its successful implementation, its theoretical framework, and its implementation on different states such as those in developed and the developing states (Aladwani, 2016; Choi, Park, Rho & Zo, 2014; Elkadi, 2013; Guijarro, 2007; Schuppan, 2009;

Veeramootoo, Nunkoo & Dwivedi, 2018).

Because of its high internet utilization, the study on the government website in the framework of e-government has been an important research theme in public administration. One of the main strands in e-government research focuses on evaluating the government's website. There are plenty of models and metrics deployed by scholars to evaluate the government's website at the national or local level (Holzer & Manoharan, 2016; Karkin & Janssen, 2014). Previous studies also tried to determine the state of one government's website through stage models developed by various scholars (Layne & Lee, 2001; Moon, 2002). Website evaluation by looking at the evaluation metrics and/or website stage model has become a dynamic field where the exploration of the topic focuses not only on technical aspects of the website but also (more importantly) on how the government's website promotes or supports the principles of democracy (Karkin & Janssen, 2014; Lee-Geiller & Lee, 2019).

Unfortunately, that rich exploration of the government's website study seems to be ignored in the Indonesian e-government literature. Many studies on the Indonesian government's website stressed evaluating Indonesian e-government stages (Dahlan, 2008; Nurdin, Stockdale & Scheepers, 2012; Yunita & Aprianto, 2018), and if there is research on government website evaluation, they have mainly used a single set of metrics/model or used national or ministerial regulations as evaluation variables and have not developed any particular models for evaluating government' websites (Dahlan, 2010; Hermana & Silfianti, 2011; Kurniawan, Rakhmawati, Abadi, Zuhri & Sugiyanto, 2017; Prahono & Elidjen, 2015; Sulistiyo K, Negara & Firdaus, 2008; Wahid, 2008), while others have focused on the role of e-government in public administration reform agenda (Prahono & Elidjen, 2015), and Indonesian citizen acceptance on e-government service (Rokhman, 2011). In that sense, the previous studies fail to grasp the best feature of the existing government website evaluation models.

With that in mind, this study tries to adopt multiple government website evaluation models to produce a comprehensive evaluation. This study focuses on ten local governments (Municipality/Regency) in East Kalimantan on the rationale that despite many studies addressing local government's website evaluation in Indonesia, only a few have focused on East Kalimantan. If there is, it has only used a single model of evaluation. There are (in alphabetical order) Balikpapan Municipality, Berau Regency, Bontang Municipality, Kutai Barat Regency, Kutai Kartanegara Regency, Kutai Timur Regency, Mahakam Ulu Regency, Paser Regency, Penajam Paser Utara Regency, and Samarinda Municipalities.

Literature Review
Overview of Government's Website Evaluation Models: Various Metrics and Variables

Studies concerning website evaluation have become an exciting topic in information science literature. Websites have become an integral part of the so-called "informational society ", whose infrastructure is based on information technology, computers, and electronic communication systems (Jafar Mehrad, Eftekhar & Goltaji, 2020). As an effective means of communication, websites are widely used by many organizations, from companies, universities, and the government. They invest a significant amount of money in developing and maintaining their websites. Along with that, website evaluation studies are growing to describe, analyze, and improve those websites according to each organization's particular needs. For example, the study of a company's websites evaluation might focus on the utilization of websites to promote their brand (Crosato, Domenech & Liberati, 2021; Simões, Singh & Perin, 2015; Thorleuchter

& Van den Poel, 2012), while for university's websites, the questions revolve around the role of university's website in delivering services for the stakeholders, such as students, parents, industry, and for university staff (Faizal & Prasetio, 2020; Farashi, Bashirian & Zareian, 2020; Firozjah, Dizaji & Hafezi, 2019; Gharibeniazi, Kamran & Ghaebi, 2015; Niazi, Kamran & Ghaebi, 2020; Sherafat & Davoodi, 2018)

For a government website evaluation study, the questions are more or less the same. With the significant amount of investment made for developing public websites and the development of electronic government on a global scale, government's website evaluation studies have grown considerably over the last decade in line with the popularity of e-government research. Government website evaluation involves several criteria or metrics, and by assessment of each metric, the current state of e-government is determined. There are six commonly used metrics or standard models as identified by Karkin & Janssen (2014): content, privacy/security, usability, quality, accessibility, and citizen engagement. The first metric is the content. In brief, content refers to all kinds of information provided on the website (Criado & Ramilo, 2003; Feeney & Brown, 2017; King & Youngblood, 2016; Youngblood & Youngblood, 2018). However, the definition might not be that simple. Huizingh, for example, differentiates content from design. While content refers to the information, features, or services offered on the website, the design is how content is made available for the website visitor (Huizingh, 2000). From that insight, Karkin & Janssen (2014) define content as a type of information and style made available through websites.

Second, the privacy/security metric concerned about the protection of user' personal information submitted to the website (for example, ID card number) or made available through the internet connection (automatically generated location coordinate) (Beldad, De Jong & Steehouder, 2009; Ginosar & Ariel, 2017; Zhao & Zhao, 2010). Privacy/security is also related to controlling individuals' personal information because once the information is digitalized, it is harder to control (Tang & Lin, 2017). Privacy/security plays a vital role in the public's trust towards the website (Chang, Wong, Libaque-Saenz & Lee, 2018; Kim, Jin & Swinney, 2009). The next metric is usability. Usability can be defined as an assessment of the user's experience with the website, the easier a user can operate them, the better they are. According to International Standards Organization's (ISO) definition, usability is the extent to which citizens can use a website to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified e-government service context (Venkatesh, Hoehle & Aljafari, 2014; Verkijika & De Wet, 2018). Wagner, Hassanein and Head (2014) expanded the concept by adding users' satisfaction during their use. Moreover, usability has two dimensions: utilitarian and hedonic. The former is related to the functions and goal-oriented performance, while the latter is related to the website's entertainment, enjoyment, and fun aspect (Wagner, Hassanein, & Head, 2014). Usability is a significant feature of website assessment, primarily related to users and attitudes towards the website (ibid).

On the other hand, the quality metric is all the attributes that websites should have (Karkin & Janssen, 2014). There is a vast literature on website quality research (Janita & Miranda, 2018; Loiacono, Watson & Goodhue, 2007; Papadomichelaki & Mentzas, 2012; Sá, Gonçalves & Rocha, 2016). It is driven by developing a website that meets the user/citizen's needs. To that end, a series of evaluation criteria for website quality have been formulated. Loiacono et al. (2007) introduced WebQual, a 12 dimensions evaluation model. Other scholars reduced the number to four, such as Sá, Gonçalves, and Rocha that identified four domains of website

quality: service quality, information quality, management quality, and technical quality, and Janita and Miranda who identified information, efficiency, security, and communication dimensions (Janita & Miranda, 2018; Sá et al., 2016). Papadomichelaki and Mentzas (2012) introduced the e-GovQual model consisting of ease of use, trust, the functionality of the interaction environment, reliability, content, and appearance of information, and citizen support. Since the model was developed for user/citizen needs, user perception becomes pivotal in those evaluation models. However, Karkin and Janssen (2014) took a different approach by measuring website quality through the ratio of broken links, update range, visual elements, transactions, and website layout. What they do is to exclude human-computer relations and focus solely on the technical features of the e-government website.

Since public revenues fund the government website, they need to be accessible for all citizens. For that reason, the next metric is aimed to measure the accessibility of government websites. The main goal of website accessibility is to ensure that web pages are easy to navigate and read, irrespective of the disabilities that the users are experiencing (Ismail & Kuppusamy, 2019). Web Content Accessibility Guidelines (WCAG) is a standard specified by the World Wide Web Consortium (W3C) under the Web Accessibility Initiative (WAI) project since 1999. According to the standard set in WCAG, a website must meet several essential features. It includes providing text alternatives for non-text content, an alternative for media, different ways of content presentation, easily read and heard content, accessible functions through the keyboard, navigable content, understandable text content, predictable and compatible content (Kesswani & Kumar, 2016).

The last commonly used metric is citizen engagement. It refers to the provision of tools designed for user/citizen participation (Karkin & Janssen, 2014). In the e-government context, those tools aim to collect citizens' input in the governmental process that can be found in citizen satisfaction questionnaires, citizen proposals, or direct communication with government officials.

Table 1
Common Website Evaluation Metrics

Content
Privacy/security
Usability
Quality
Accessibility
Citizen Engagement

Source: (Karkin & Janssen, 2014)

Despite its comprehensive utilization of website evaluation research, the common model is neither exhaustive nor set rigidly. Some scholars try to develop their metrics based on their adjustment to their case. On many occasions, the boundary of each metric seems irrelevant as they mix and combine the variables of several metrics and put them in whole new criteria. Sometimes, the variable of one metric in the common model is placed in the other metric.

Fan, for example, developed six website evaluation metrics similar to the common model and used a five-point Likert scale to evaluate the variables starting from 0 (unavailable) to 4 (excellent implementation) but modified them in its application on 14 local councils' websites

evaluation in the Great Western Sydney (GWS) region in Australia. Fan's website evaluation metrics consist of privacy/security, usability, e-content, e-services (non-financial transactions and financial transactions), e-participation, and feedback on the website. Those metrics are broken down into several variables to help the measurement process. The privacy/security metric is measured by the privacy and security policy on the website. Usability is measured by ease of use web page design, searching capabilities, multilingualism, disability access, and links to external websites. Here we can see that Fan's usability metric also includes accessibility metrics in the common model (multilingualism and disability access). The e-content metric's variables are contact details, online publications, directory of other government services, directory of local services, and multimedia material. Because Fan's research took place on the local councils' website, she added transaction criteria (non-financial and financial transactions) under the e-services metric. The variables of e-services are online registration, online request for services, online application for the permit, online library services, and e-tendering system for non-financial transactions and online payment of rates and fees, and e-procurement for financial transactions. The last two metrics are closely related to citizen engagement metrics in the common model. E-participation metric consist of Frequently Asked Question (FAQ), submit comments online to councilors, and management, online consultation with councilors and management and voting online, while Feedback on website metric consists of the ability to report problems/deficiencies in the website and the ability to request inclusion of facilities in the website (Table 2).

Table 2

Qiyuan Fan Website Evaluation Model

Website Evaluation Metrics	Variables
Privacy/Security	Privacy policy
	Security policy
Usability	Ease of use web page design
	Searching capabilities
	Multilingualism
	Disability access
	Links to external websites
E-content	Contact details
	Online publications
	Directory of other government services
	Directory of local services
	Multimedia material
E-services	*Non-financial transactions*
	Online registration
	Online request for services
	Online application for permit
	Online library services
	E-tendering system
	Financial transactions
	Online payment of rates and fees
	E-procurement
E-participation	FAQ

	Submit comments online to councillors
	Submit comments online to management
	Online consultation with councillors
	Online consultation with management
	Voting online
Feedback on website	Ability to report problems/deficiencies in the website
	Ability to request inclusion of facilities in the website
Source: (Fan, 2011)	

Holzer and Manoharan employed the Rutgers E-Government Survey Instrument developed since 2003 to assess the websites of 100 cities worldwide in terms of digital governance and rank them on a global scale (Holzer & Manoharan, 2016). The instrument consists of five metrics with 104 variables. They are privacy and security, usability, content, services, and citizen and social engagement. Privacy/security metric includes privacy policies, authentication, encryption, data management, and cookies, while usability highlights user-friendly design, branding, length of the homepage, targeted audience, links or channels, and site search capabilities. The content metric includes access to current accurate information, public documents, reports, publications, and multimedia materials. Like Fan's (2011) model, Holzer and Mahoharan (2016) added transaction variables in the services metrics, namely transactional services: purchase or register, and interaction between citizens, businesses, and government. The citizen and social engagement metrics contain online civic engagement/policy deliberation, social media applications, and citizen-based performance measurement (Table 3). Holzer and Manoharan then used a four-point e-governance scale starting from 0 to 3 to rank the website of 100 cities.

Table 3

Holzer and Manoharan Website Evaluation Model

Website Evaluation Metrics	*Keywords*
Privacy/Security	Privacy policies, authentication, encryption, data management, cookies
Usability	User-friendly design, branding, length of homepage, targeted audience links or channels, and site search capabilities
Content	Access to current accurate information, public documents, reports, publications, and multimedia materials
Services	Transactional services—purchase or register, interaction between citizens, businesses and government
Citizen & Social Engagement	Online civic engagement/policy deliberation, social media applications, citizen-based performance measurement

Source: (Holzer & Manoharan, 2016)

Fietkiewicz, Mainka and Stock (2017) did similar research as Holzer and Manoharan in evaluating world cities' websites; however, while Holzer and Mahoharan evaluated 100 cities websites, Fietkiewicz et al. (2017) focused on 31 informational World Cities as identified by Mainka, Hartmann, and Orszullok (Fietkiewicz et al., 2017; Mainka, Hartmann, Orszullok, Peters, Stallmann & Stock, 2013). Fietkiewicz et al. applied evaluation on three components: maturity of e-government, the usability of the navigation systems, and the boundary documents. The first component, the maturity of e-government, was developed according to Hiller and

Belanger (2001) and Moon (2002) models. It contains five metrics (or pillars as they called them): information, communication, transaction, integration, and participation. For usability evaluation, they used a method introduced by Röttger and Stock (2003) and designed ten usability tasks, while boundary documents refer to instruction sheets detailing how they interact with the website. Interestingly, Fietkiewicz et al. (2017) model put several common metrics under the maturity of e-government criteria, excluding the usability metric and boundary documents as separated metrics. Each metrics in the maturity of e-government criteria was broken down into several variables, and each variable was given proportional points (Table 4).

Table 4

Fietkiewicz et al. Website Evaluation Model

Website Evaluation Metrics	Variables
Information	Is a press release available?
	Is basic information available?
	Is the information on healthcare available?
	Is the information on politics available?
	Is the information on services available?
	Are forms for services available?
	Is the information for various user groups available?
	Is the website accessible via smartphones?
	Are applications for smartphones available?
	Are push services available?
	Is the website available in English?
	Is the website available in the languages of the three most important immigrant groups?
Communication	Are social media services used?
	Is it possible to make appointments with authority via the web?
	Do I get answers to email requests?
	Is emailing possible instead of written (snail) mail?
	Is it possible to leave feedback or complaints?
Transaction	Is it possible to fill out forms online?
	Is it possible to pay taxes online?
	Is it possible to pay penalties online?
	Is it possible to pay fees online?
	Are services for libraries available?
	Is a personalized portal available?
Integration	Is an entry homepage available?
	Email: Cooperation with authorities?
	Software/safety measure/intranet/database?
Participation	Are online questionnaires available?
	Do forums and platforms for asking questions exist?
	Is it possible to participate in a community meeting via the WWW?
	Is it possible to vote online?

Source: (Fietkiewicz et al., 2017)

Since the concept of e-government is closely related to the principles of democracy, its' implementation is commonly perceived as a pathway toward good governance, resembling the

ideal portrait of democratic governance. However, the impact of e-government initiated has been limited (Barbosa, Pozzebon & Diniz, 2013; Osman et al., 2014; van Velsen, van der Geest, ter Hedde & Derks, 2009) and based on that concern, Lee-Geiller and Lee (2019) developed a model to address the lack of democratic e-governance implementation called Democratic E-Government Website Evaluation Model (DEWEM). Drawing from the vast literature from website quality, e-service, and open government, they formulate three dimensions of democratic e-governance guidelines. However, it could serve as an evaluation metric, as well. DEWEM consists of transparency, service quality, and citizen engagement. The transparency metric is broken down into open accessibility and information disclosure variables. The service quality consists of interoperability of services and credibility variables, and citizen engagement contains political efficacy, deliberation, and collaboration variables (Table 5).

Table 5

Lee-Geiller & Lee Website Evaluation Model

Website Evaluation Metrics	*Variables*
Transparency	*Open Acessibility*
	Non-discriminatory
	Open license
	Free of charge
	Non-proprietary
	System availability
	Alternative channels
	SNS/smartphone
	Information Disclosure
	Types of information
	Quality of information
Service Quality	*Interoperability of Services*
	Coordination at the national level
	Accuracy
	Navigation structure
	Content organization
	Visual element
	Processing capacity
	Credibility
	Error management
	Website guidelines for citizens to use
	Terms of use statement
	Privacy
	Safety
Citizen Engagement	*Political Efficacy*
	Responsiveness to inquiry/complaints
	Direct communication with elected government officials
	Encouragement/promotion of participation
	Sharing the products and outcomes created through collaboration

	Deliberation	
	Collaboration	

Source: (Lee-Geiller & Lee, 2019)

Karkin and Janssen (2014) shared similar concerns with Lee-Geiller & Lee regarding the lack of democratic principles on the public website. They propose an evaluation model using the Public Values (PVs) perspective to assess the realization of PVs principles in the Turkish Metropolitan Municipalities' website. By doing so, they split the web evaluation and Public Values metrics into a separate dimension. Web evaluation metrics, divided into three metrics: content, usability, and quality, touch on technical aspects such as the ratio of pages with usability issues, broken links, update range, visual elements, and website layout, while Public Values metrics explore the accessibility, citizen engagement, transparency, responsiveness and they further add dialog and balancing of interest in the PVs metric. They use several software tools to support the assessment, such as SortSite Evaluation 4.7.564.0 to analyze website usability, Xenu's Link Sleuth 1.3.8, and Mozilla Update Scanner 3.1.10 to analyze broken links update range. Fujitsu Web Accessibility Inspector 5.11 to analyze website accessibility. The research emphasizes dialog and balancing of interest as key elements of PVs besides transparency and responsiveness. Dialog is very similar to citizen engagement, but the difference is where the latter measure whether websites use tools to stimulate citizen input to public policy. The former is more aimed at evaluating whether a website has tools for capturing online comments. The balancing of interest metric focuses on the asymmetric relationship between the government institutions as the stronger party and the citizens/users as the weaker party. That asymmetrical relation is reflected in the website configuration where the needs of citizens/users are often neglected, so the metric is trying to find whether the websites have provided announcements of information or updates to the general advantage of citizens. Karkin & Janssen's website evaluation metrics are described in Table 6.

Table 6
Karkin and Janssen Website Evaluation Model

Websites Evaluation Metrics	*Variables*
Content	Categorization
Usability	Ratio of pages with usability issues
	Broken links (ration of erroneous links in percentage)
Quality	Update range (daily average)
	Visual elements (4 factors)
	Online transactions
	Website layout (the W3C css level 3 / number of errors)
Accessibility	The ratio of number of problems
Citizen engagement	The presence of tools to stimulate citizen input to public policy (Web 2.0 tools) (4 factors)
Transparency	Disclosure of public documents (5 factors)
Responsiveness	The time it takes to receive a response
Dialog	The presence of tools to capture online comments (5 factors)
Balancing of interest	Provision of announcements of information or updates to the general advantage of citizens

Source: (Karkin & Janssen, 2014)

We can see no uniform set of website evaluation metrics from the literature overview, and previous research applied different modifications for their case. However, that diverse set of metrics also benefits research on the same theme by offering options for combination. This research will combine the previous evaluation metrics and modify them regarding the Indonesian local government website evaluation. By doing so, this research adopts Karkin & Janssen's (2014) framework but at the same time modifies them by integrating some of the metrics and variables from the other scholars that fit the research's case. Their framework adoption is because the case brought by them is similar to this research in assessing local government's website (municipalities/regencies) and the comprehensiveness of their framework by dividing the technical aspects and PVs as the manifestation of democratic principles in the website configuration. However, this research made some adjustments in respect to national regulations, such as some provisions in the Public Information Disclosure Act in 2008 (Republic of Indonesia, 2008) that serve as the variables in the transparency metrics as opposed to the variables used by Karkin & Janssen (2014) and also Lee-Geiller & Lee (2019).

Research Method

To have a comprehensive study about local government's website evaluation, we conducted several steps:

1. Literature review to find and explore various website evaluation models from previous scholars
2. Formulating our website evaluation model that is adjusted and modified to the Indonesian context
3. Data collection using automatic software of SortSite 5.3.5, observation, and manual corresponding
4. Data presentation

The first step, a review of the vast literature of public website assessment, was conducted to find previous studies with a similar theme and identify the model or metrics they used. This study followed the approach introduced by Levy and Ellis (2006) in conducting a useful literature review to evaluate the local government's website of 10 municipalities/regencies in East Kalimantan Province. To find the previous studies, we searched on reports, journal articles, proceedings, and working papers using online scientific databases such as Google Scholars, Science Direct, Taylor & Francis Online, Emerald, Springer, Sage Publication Wiley, Researchgate, Web of Science for international papers and *sinta.ristekbrin.go.id* specifically for Indonesian papers. We used keywords such as "electronic government ", "website evaluation models ", and "local government's website ". The papers explored in this research were published from 2000 to 2020. This 20-year range is expected to give us insight into the emerging study of a website evaluation, its development, and its latest application in several places. Of the great result we get from the search engine, there are two significant website sub-themes evaluation studies, there are those who: evaluate the government' website within the framework of e-government stages (Coursey & Norris, 2008; Hiller & Belanger, 2001; Layne & Lee, 2001; Lee, 2010; Rooks, Matzat & Sadowski, 2017; Siau & Long, 2005; United Nations, 2008, 2012).

Moreover, those apply website evaluation metrics with little regard to the e-government stages. We focused on the latter, and from there, we chose several titles that have many

similarities with our study and applied *backward references search*. Backward references search refers to reviewing the references of the obtained titles (Levy & Ellis, 2006). For example, one of the first papers yielded from the search engine came from Lee-Geiller and Lee (2019) and their paper. We review the references they used, such as Karkin & Janssen and Sá et al. (2016) From the backward references search process, we found five papers that have developed their government website evaluation metrics (Fan, 2011; Fietkiewicz et al., 2017; Holzer & Manoharan, 2016; Karkin & Janssen, 2014; Lee-Geiller & Lee, 2019).

After the literature review was done, we developed our website evaluation model in the second step. This model could suit more with the context of the Indonesian local government's website. We used a hybrid website evaluation model to adjust to the Indonesian context based on previous models and modifications. We followed Karkin and Janssen's (2014) framework in splitting the technical and democratic dimensions (in this study, we called it *democratic deliberation*). Besides that, we made some adjustments to the context of this study that needs to be explained:

First, one needs to address the variation of design and the content of Indonesian local government websites. In 2003 Indonesian Ministry of Communication and Information Technology had provided a guideline of public web content that obligates the local governments to include the following information: overview, local government, geography, local maps and resources, regional regulations and policies, news and guest book (Kurniawan et al., 2017; Sulistiyo K et al., 2008). However, the local government's compliance to set their website according to the guideline was still low (Sulistiyo K et al., 2008). Nevertheless, the guideline is still helpful in providing insights about what should be included in the local government's website. For that reason, this study also uses the guideline as variables in the primary information metric. Second, in the Indonesian public website context, multiple services have their website at the national or local level, such as whistleblower links found at the national level (lapor.go.id) or at the local level. The other service in the context of this study is the provision of public information following the Public Information Disclosure Act in 2008. The Act obligates every public body/agency to form their Information and Documentation Management Officer (*Pejabat Pengelola Informasi dan Dokumentasi/* PPID). So with this context, any public information stated in the Public Information Disclosure Act must be managed by PPID. Consequently, in this study, aside from the local government website (portal), we also observe the PPID website.

We formulated our website evaluation model with that context in mind, consisting of two main dimensions: technical and democratic deliberation. On the technical dimension, we seek to observe the Errors (percentage of broken links), Accessibility (percentage of accessibility issues following WCAG 2.0 guidelines), Compatibility (percentage of compatibility issues), and Standards (percentage of pages that do not comply with W3C standards) and to assess the technical dimension, and we use SortSite 5.35. software. As for the democratic deliberation dimension, we separate it into three metrics: Content, Transparency, and Communication. We called it democratic deliberation because the metrics reflect the essence and ideals of democratic principles. In a nutshell, democratic principles emphasize public interest in government, and the government must be held accountable and accessible for all citizens.

Following that logic, in the Content metrics, the variables are the availability of in search feature, basic information, information of services, and security/privacy statement on the PPID website. The first three variables are related to the public interest and how the website can

provide the information they need and with relative ease (in search feature), while the last variable deals with the security of citizens' private data when they upload them on the PPID website. In the PPID system, any citizens who wish to get certain public information/documents must register and upload private data such as ID Card number, phone number, and home address. In the transparency metrics, we scrutinize whether the portal web has links directed to the PPID website, the availability of last year's financial reports, and the whistleblower link. As for the last metrics, we see how many social media the government has? Does the website provide an online chat service? Is the email on the website active? Moreover, does the website provide a hotline call?. The website evaluation model we use in this study can be seen in (Table 7).

The third step was data collection. In this paper, we used SortSite 5.3.5 to find information about the *technical dimension* of the websites. SortSite 5.3.5 is an automatic website testing tool that identifies broken links, browser compatibility, legal standards compliance, and accessibility issues. This software was used to find data about errors, accessibility, compatibility, and standards of 10 local government's websites. While for the *democratic deliberation*, we observed the websites to find features like in-search feature, basic information, information of services, links to PPID, availability of financial reports, whistleblower links, online chat feature, local government's social media, hotline numbers information, and email address. Specific to the local government's email, we sent an email to the official email address posted on the local government's website and waited for the reply to identify whether the email was active or not.

The last step is data presentation which will be discussed in the next section.

Table 7
Synthetic Website Evaluation Metrics

Website Evaluation Metrics	*Variables*
Technical Dimension	
Errors	Percentage of Broken Links
Accessibility	Percentage of Accessibility issues (in line with WCAG 2.0 Guidelines)
Compatibility	Percentage of compatibility issues
Standards	Percentage of pages that do not comply with W3C Standards
Democratic Deliberation	
Content	In Search Feature
	Basic Information
	Information of Services
	Security/Privacy (on PPID website)
Transparency	Links to PPID on Portal web
	Availability of Last Financial Reports
	Whistleblower links
Communication	Social Media
	How many Social Media does the government have?
	Online Chat
	Does the website provide online chat service?

Email address	
	Is the email on the website active?
Hotline	
	Does the website provide hotline calls?

Findings

Using our modified model, we evaluate the website of the ten local governments (Municipality/Regency) in East Kalimantan Province. The evaluation result is depicted in (Table 8). On the technical dimension, we use SortSite 5.3.5. software to examine four metrics: errors, accessibility, compatibility, and standards. The first metric is the *errors,* which indicate how many links do not work or cannot be accessed. The results showed that the Kutai Kartanegara website has the lowest broken links, with only 2% of overall pages with error issues. The Penajam Paser Utara website has the highest percentage, with 36%. It is worth noticing that out of ten local governments websites, only two websites have a score below 10% (besides Kutai Kartanegara, Samarinda only has 4% of errors). In contrast, the rest of them have scores above 10%, with an average of 19%.

Accessibility test, on the other hand, is based on Section 508 of the Rehabilitation Act – 82 FR 5790 (2017) and Web Content Accessibility Guidelines 2.0 (WCAG 2.0 – 2008). Again, based on the result, Kutai Kartanegara and Samarinda websites perform the best, with only 3% of pages with accessibility issues. The worst score of accessibility is found in the Balikpapan website with 69%, much higher than the average of all other websites, which is 29%.

Table 8

Ten Local Government Website Evaluation Result

City/Municipality	Technical				Democratic Deliberation										
					Content				Transparency			Communication			
	Errors (%)	Accessibility (%)	Compatibility (%)	Standards (%)	In search feature	Basic Information	Information of Services	Security/Privacy (on PPID website)	Links to PPID on Portal web	Availability of Last Year Financial Reports	Whistleblower link	Active Social Media*	Online Chat	Email Address	Hotline
Balikpapan	24	69	1	24	yes	yes	yes	no	yes	yes	yes	1 (Fb & IG)	yes	inactive	yes
Berau	11	11	11	11	no	yes	yes	no	no	no	no	2 (Fb & IG)	no	inactive	yes
Bontang	23	23	23	23	no	yes	yes	no	yes	yes	yes	1 (Fb)	yes	inactive	yes
Kutai Barat	35	35	17	35	no	yes	no	no	yes	no	yes	2 (Fb & YT)	no	inactive	yes
Kutai Kartanegara	2	3	2	3	no	yes	yes	no	yes	no	no	1 (Tw)	no	active	yes
Kutai Timur	30	39	30	30	no	yes	yes	no	yes	no	yes	2 (Fb & IG)	no	inactive	yes
Mahakam Ulu	17	17	7	17	yes	yes	no	no	no	no	yes	2 (IG & YT)	no	inactive	no
Paser	10	49	10	10	no	yes	no	no	yes	yes	yes	1 (YT)	no	no	no

Penajam Paser Utara	36	36	2	36	no	partial	no	no	yes	yes	yes	no	no	no	no
Samarinda	4	3	4	3	yes	yes	yes	no	yes	yes	yes	1 (Fb)	no	inactive	yes

* Fb = Facebook; IG = Instagram; YT = Youtube; Tw = Twittwr

On the compatibility metrics, the software examines the compatibility of websites with multiple browsers like Android, Chrome, Edge, Internet Explorer, Firefox, Opera, Safari, and iPhone/iPad browser. Balikpapan website has the lowest percentage of compatibility issues with only 1%, and Kutai Timur website has the worst with 30%, while the average score of ten websites is 11%.

The last technical dimension metrics are standard metrics set to indicate the percentage of pages that do not comply with W3C standards, such as W3C CSS Validation, W3C Deprecated Features, and W3C HTML Validation and W3C HTML5. In this metric, Kutai Kartanegara and Samarinda websites have the best score of 3%, and Penajam Paser Utara has the worst score of 36%. In comparison, the average score of standard metrics of all websites is 19%.

Discussion

Moving on to the Democratic Deliberation dimension, we use three broad metrics in the model: *Content, Transparency, and Communication*, and each metric has its variables. Regarding the *Content* metrics, the variables are: *in search feature, basic information, information of services*, and *security/privacy (on PPID website)*. Out of ten websites, only three websites provide *in search feature* for the user (Balikpapan, Mahakam Ulu, and Samarinda). This shows that the rest of the local government failed to maximize the benefit of such a feature on the website. One of the most important things for the informational society is finding any information quickly and quickly. *The search feature of a website provides an effective means to access the website database and help the users find the* information they need (Mehrad & Rahimi, 2009).

For *basic information* variables, we use the Indonesian Ministry of Communication and Information Technology guideline in 2003 that obligates the local government websites to provide information regarding the overview, local government, geography, local maps and resources, regional regulations and policies, news, and guest book. According to the result, almost all local governments in this study have provided the basic information on their website except for the Penajam Paser Utara website, which only provides partial information. The following variable is the provision of *information on services* where six websites (Balikpapan, Berau, Bontang, Kutai Kartanegara, Kutai Timur, and Samarinda) contain information regarding the services they provide. At the same time, the rest of them have little or no information at all. One of the critical findings in this study is that no websites provide the security/privacy policy on their PPID websites.

The variables for the transparency metrics are links to PPID on the portal web, the Availability of last year's *financial reports, and the whistleblower link*. PPID or Information

and Documentation Management Officer is the agency with authority in information management, as stated in the Public Disclosure Act 2008. Providing links to each local government's PPID website on their portal web is an essential feature concerning public information disclosure. Out of ten websites, only two do not link their PPID on the portal (Berau and Mahakam Ulu). On the *availability of last year's financial reports*, only five websites provide the documents, statistics, and/or links of their financial reports in the previous year (Balikpapan, Bontang, Paser, Penajam Paser Utara, and Samarinda). It is worth noticing that while all citizens can officially request the information regarding local governments' financial reports via PPID, but the provision of such a document on the portal website could significantly help the user to find the information. The last variable of transparency metrics is the whistleblower link. This link is intended to provide tools for citizens to report on corruption or any abuse of power by the local government. Only two websites do not have whistleblower links on their portal (Berau and Kutai Kartanegara). However, it should be noticed that out of the remaining eight who have whistleblower links on their portals, only four websites have their whistleblower links (Balikpapan, Bontang, Kutai Barat, and Samarinda). At the same time, the rest use the national whistleblower platform (lapor.go.id).

Many researchers have studied local government use of social media or Web 2.0 tools. Furthermore, in this study, we want to find how many *active social media* the government has. Almost all of the local governments in this study use at least one social media except Penajam Paser Utara, which has none. Only two websites have the feature (Balikpapan and Bontang). We performed the official email address test by sending an email to each official email address presented on the portal website between November and December 2019 and waiting for the response. Unsurprisingly, only one local government has an active email address (Kutai Kartanegara). The last variable is the provision of *hotline* numbers such as police department, hospital, and/or other important phone numbers. In this variable, only three local governments do not provide hotline calls on their portal website (Mahakam Ulu, Paser, and Penajam Paser Utara).

Based on the findings, the overall quality of ten local government websites in East Kalimantan can be considered relatively good despite the need to improve several aspects, especially on *accessibility* which have the biggest problem compared to the other variables. It indicates that, in general, all of the local government websites in East Kalimantan have not entirely obeyed the guidelines in WCAG 2.0. That also means that some East Kalimantan residents do not have sufficient access to the websites due to their particular needs (old residents, people with disabilities, etc.). It becomes more problematic because the public funds all the websites to be accessible to all of East Kalimantan residents with no exception. Furthermore, *accessibility* is related to other issues. Low accessibility on government websites could hamper citizen participation, regardless of the channels provided by the government to support them. On top of that, accessibility is the key to any website, even more so for government websites. With good accessibility then at least the fundamental purpose of the website is already fulfilled.

On the other hand, all the websites, in general, do not have any serious problems with compatibility and can perform relatively well on various browsers. However, there are more problems with the many *broken links* on each website. It indicates that some information on the websites cannot be opened or is inaccessible to the users. This, of course, will affect the communication process between the government and the public. With that, the government

needs to pay more attention to many websites that do not follow the guidelines set by W3C.

It can also be said that local government websites in East Kalimantan have performed relatively well in fulfilling the *minimum* of the democratic principle. We called it minimum because most websites have provided the users with basic information and services. Also, most of them have put in the links to PPID which serves as an agency responsible for information management. This is crucial because, on some websites, we cannot find important public documents such as the previous year's financial report. With PPID links on the portal websites, the user can go to the PPID website to request the documents. The other thing that supports the fulfillment of the democratic principle is the availability of whistleblower links on the majority of the websites. Although some use the national platform (lapor.go.id), it is enough to provide the users with a channel to report any government misconduct.

On the other hand, the communication metrics show that East Kalimantan local governments rely heavily on social media to communicate with their citizens. Given the high number of social media users in Indonesia and their practical application, it is not surprising. However, social media is not the only communication channel provided by the websites as they also put hotline numbers on the portals. The hotline numbers such as the police department, fire department, and hospital can help to facilitate the user, primarily tourists or non-residents who need their services.

Conclusion

Many scholars have conducted studies on government website evaluation. Along with the development of those studies, they have formulated several evaluation models in which each model has its metrics and variables, thus, making the studies of website evaluation a rich and dynamic field. Unfortunately, this richness seems to be ignored in the Indonesian government website evaluation studies. Against this backdrop, this study aims to fill the gap by using a synthetic model derived from several models of website evaluation developed by previous scholars and deploying the model to evaluate ten local government websites in the East Kalimantan Province.

The model consists of technical and democratic deliberation dimensions divided into two broad dimensions. On the technical dimension, by using the SortSite 5.35. software, it is found that the local governments' website performs relatively low on accessibility and errors on four metrics evaluated by the software. On the other side, on the democratic deliberation dimension, local government websites in East Kalimantan have performed relatively well in fulfilling the *minimum* of the democratic principle. We call It minimum because at least the websites have provided the user with basic information and several channels to obtain public documents (PPID), report government misconduct (local or national whistleblower links), and direct communication using Web 2.0 tools such as social media.

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