

## Case-study

**Measuring E-Government Implementation Program:  
A Case Study of Surabaya City, Indonesia****Tony Dwi Susanto, Ph.D.**

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**Abstract**

*As the popularity of e-government initiatives in developed and developing countries increase, the need for an effective method for measuring and evaluating e-government success have become a priority for government decision makers. Governments need to measure how successful their e-government implementation programs and to take any actions needed for improvement. This paper presents a survey on 37 public sector departments under the city of Surabaya Indonesia in order to measure e-government indicators. It also discusses challenges for measuring e-government indicators in Indonesia, pros and cons of the current indicators, and recommends more comprehensive e-government indicators.*

**Key Terms:** *e-Government, Metrics, Performance Measurement, Evaluation, Public Services.*

**1. Introduction**

The term “e-government” has a broad definition. It is not merely confined to use of the Internet-based application in government. Instead, it encompasses all use of information and communication technologies (ICT) — including all ICT platforms and applications such as internet, telephone, fax, and mobile technologies — to provide government information and public services to citizens (G2C), businesses (G2B), and government employees or other government organizations (G2G) (Nations, 2002).

Providing public services through e-government systems has improved public administration efficiency, accountability and transparency, enabled many more people to access public services, and improved people trust on government (Furuholt and Wahid, 2008). “E-government holds tremendous potential to improve the way that governments deliver public services and enhance broad stakeholder involvement in public service”. Therefore, countries in all regions of the world and at all levels of development continue to make significant investments in public sector ICT (Nations, 2014). In case of Indonesia, through Presidential Instructions number 6 year 2001 and number 3 year 2003, government has directed all public institutions in Indonesia to utilize e-government in order to achieve good governance. Moreover, the new Indonesian President, Mr. Jokowi, warned all local authorities in Indonesia that he will stop *general allocation fund* (DAU) and *special allocation fund* (DAK) if they cannot setup and manage One-Stop Services

unit by end of 2015. As result, central and local governments in Indonesia allocate billions or even trillions budget for designing and implementing e-government for public services (Tif, 2014).

Despite the high attention, big budget allocation, and high initiative of local authorities to implement e-government, few local authorities in Indonesia have evaluated their e-government implementation success. By now, Indonesian government and the national regulations still concern on how to design and develop e-government systems (“What should we do”), and have not paid attention on e-government success assessment yet (“How are we doing”). At the global level, there is no formal agreement on a common international framework for measuring e-government. There is also no single view of how such indicators should be designed so that they remain relevant and practical over time applicable for all local authorities across countries with different economic strength, technological development, and aggregate level of education.

Measuring e-government success, in fact, is important since it can offer crucial signposts to point government policy makers in the right direction. Evaluation, which is triggered by the measurement, is a part of IT governance to make sure IT (e-government systems) aligns and supports the government’s vision. At national level, measuring e-government success of every local authority will provide feedback to the national government about current state, obstacles, and opportunities of e-government implementation. The feedback is needed for policy makers to take any improvement actions in strategy, policy, design, project, or operation level of e-government programs.

Measuring e-government and benchmarking to others will also provide lesson that can be learned from local authority’s e-government policy, measure e-government progress compared to other local authorities, identify and learn best practices in other local authorities, discovering national and global trends in e-government, and measure e-government underlying concept to identify points of leverage (Janssen et al., 2004).

In order to give a perspective on how local authorities in a developing country measure e-government success, this paper presents a project report exploring how public sector organizations in Indonesia developed and operated performance measurement instruments to monitor and attempt to improve public services through e-government systems development. This project surveyed and collected data from 37 public sector departments under the city government of Surabaya, which is the second-largest city with the best e-government services in Indonesia. This paper will also discuss challenges for measuring e-government indicators in Indonesia and evaluate the current indicators. This contributes to Indonesian government for improving their e-government implementation program, particularly on the progress measurement, and to suggest e-government practitioners about existing situations regarding e-government measurement in developing countries. More specifically this paper answers following research questions:

- How is the amount and variety of public services at a city level by years: increase, decrease, or same?
- What are e-government indicators of local authorities in Indonesia?
- How is current progress of e-government implementation of Surabaya city according to the measurement indicators?
- What issues facing e-government implementation programs in Indonesia?
- What are pros and cons of the current indicators, and what are recommendations for better e-government indicators?

## **2. eGovernment Measurement**

Considering the importance of e-government measurement, some studies and organization have proposed e-government success indicators.

Janssen, et al (2004) analyzed eight-teen international benchmarking studies on e-government and suggest that the e-government measurement indicators can be classified as five kinds of indicators: *input* indicators, *output* indicators, *usage/intensity* indicators, *impact/effect* indicators, and *environmental/readiness* indicators. The *input* indicators measure e-government program success based on the resources countries have invested in e-government, such as amount of financial resources devoted to e-government, IT/e-government spending as % GDP, and amount of public resources devoted to Internet infrastructure. Common challenges for using these indicators are the difficulty to get financial data specifically for e-government systems separated from other IT expenses and collecting and comparing data of local authorities under a decentralized government with various ICT situations. The *output* indicators measure based on the number of e-government application realized, for example: number of online services for citizens, number of online services for businesses, percentage of government departments that have a website, percentage of government websites that offer electronic services, and complexity of the services (i.e. information, interaction, transaction, and integration). An online system which provides higher complexity services should get higher score. The main critique toward the *output* indicators concerns the fact that there are countries that get high grade for making a lot of online systems but low actual usage. Therefore, the *output* indicators should be weighed together with the *usage*. The *usage* indicators measure e-government success according to the actual usage of e-government systems by citizens/businesses, such as number of individuals that have made use of electronic services offered, number of businesses that have made use of electronic services offered, percentage of citizens that has visited government websites to search for information, number of individuals or businesses that have made payments online, and percentage of internet traffic that pertains to electronic service delivery. Variety of usage may differ from information seeking, information provision, to transaction. The *impact* indicators measure e-government program based on the impact e-government has had, particularly relates to end user satisfaction, for example: reducing of waiting time at a government counter by X%, decrease in case of processing time at a government organization by X%, and citizen/business satisfaction level concerning e-government services. The challenge for using these indicators is requirement for primary data gathering from citizens and evaluations of organization's efforts. The *environmental* indicators measure e-government program not directly on e-government and the impacts, but they assess the degree in which a country/local authority is ready for the Information Society and its consequences which is precondition of a successful e-government, including ICT infrastructure, ICT skills, trust in ICT and legal environments. Examples of these indicators are Internet penetration rates, broadband penetration, Internet access tariffs, amount of public access points, fear of invasion privacy, online shopping rate as an indicator of trust in online environments, amount of academic institutions that excel in ICT knowledge, online legal environment, online safety, and online privacy. This study recommends a balanced mix of different e-government indicators including indicators of e-government supply (the *input* and the *output* indicators), e-government demand (the *usage* and the *impact* indicators), and the overall readiness a country/local authority to implement a successful e-government (the *environmental* indicators).

Meanwhile, the United Nations Economic Commission for Africa (Africa, 2014) recommends a manual for measuring e-government in order to provide countries with the statistical knowledge necessary to compile the core e-government indicators in a way that ensures their international comparability. The manual provides: a general outline of the stages leading up to the commencement of the data collection phase (survey planning, budget and management issues, and staff training and selection); the core e-government indicators (scope, statistical units,

classifications, weighting and time related factors, such as reference dates and frequency); potential data sources and data collection methods; question and questionnaire design and content; survey design (statistical units, scope and target populations, survey frames, and sample design and selection); the stages in data processing (such as data entry, data editing and estimation); data quality (sampling and non-sampling error, assessment of data quality); and dissemination (metadata reporting and dissemination, data collection and dissemination by international organizations, and reporting core indicator data to international organizations). This manual recommends seven e-government core indicators which can be classified into four broad areas: Use of ICT by persons employed in government organizations (EG1, EG2), availability of ICT to government organizations (EG3, EG4, EG5), use of ICT by government organizations (EG6), and supply of e-government services to citizens (EG7). Table 1 presents the e-government core indicators.

Code	Indicators
G1	Proportion of persons employed in central government organizations routinely using computers
G2	Proportion of persons employed in central government organizations routinely using the Internet
G3	Proportion of central government organizations with a local area network (LAN)
G4	Proportion of central government organizations with an intranet
G5	Proportion of central government organizations with Internet access, by type of access
G6	Proportion of central government organizations with a web presence
G7	Selected Internet-based services available to citizens, by level of sophistication of service

*Table 1. E-Government core indicators  
recommended by United Nations Economic Commission for Africa*

Another e-government measurement is suggested by United Nations Department of Economic and Social Affairs called *Measurement and Evaluation Tool for E-Government Readiness* or “METER2” (Affairs, 2009). METER2 is an online and interactive tool to assist governments in developing, monitoring, refining and improving the context within which information and communication technologies are used to transform government through e-Government. It helps governments to determine and monitor a country’s current state of affairs with regard to the establishment of an environment that enables e-government development, including identifying the issues that need to be addressed. METER indicators are more like the *environmental* indicators, measuring five groups of indicators or main pillars or building blocks to the establishment of a supportive enabling environment for e-Government, those are: commitment, legal, vision and policy, organization, and technology. Each pillar has a number of sub-themes containing self-assessment statements asking respondents to answer each statement by selecting whether you *Strongly Agree, Agree, Neither Agree or Disagree, Disagree or Strongly Disagree* with the statement as it relates to their own individual situations. Although the METER measures many e-government aspects, but most of the statements are more *environmental* indicator to measure a country’s readiness for e-government, than measuring *input, output, impact or usage* indicators of e-government. The validity answers of the METER statements (i.e. *Strongly Agree, Agree, Neither Agree or Disagree, Disagree or Strongly Disagree*) are difficult to be justified since they are subjective and qualitative. Additionally, the respondents should be policy makers or individuals who have complete data or long experience in related statements.

### **3. Research Design and Methodology**

This study measured e-government progress at 37 public sector departments under the city of Surabaya government by conducting a survey. Data were collected by site visit observations, questionnaires and interview with decision makers and operators of e-government services at every department.

Four questionnaires were developed to collect information about:

- i) *Public services*, covering amount, names, procedures, and types of public services provided by every department, and legal basis for the services;
- ii) *Output* indicators that is IT support for every services (back-end/front-end systems, intranet/internet, application's name, and status online/offline) ;
- iii) *Usage* indicator that is amount of individual and businesses that have made use of every online services offered compared to all applications (online and manual services);
- iv) *E-government supporting aspects*, including IT plan, IT budget, IT infrastructure (network, server, PC, etc.), IT department, IT policy, and IT staff (amount, education/training, certification) for every public sector department.

Eleven surveyors visited 37 public sector offices in Surabaya distributing the questionnaires and conducting interview with public service administration staffs, supervisors, IT system operators, and the department leaders. The surveyor also confirmed the information collecting from respondents by observing the electronic applications, IT infrastructure, and supporting documents.

#### **4. Results and Discussion**

As a city with the best e-government services in Indonesia, Surabaya city has already had a master plan for e-government and has been developing e-government systems based on it. Also, the local authority has defined two e-government success indicators (*output* and *usage* indicators) and their target levels declared on the *Medium-Term Local Development Plan (RPJMD)* document, those are: percentage of online public services compared to all available public services (with target of 23.15% or 25 online service must be available by December 2015) and percentage of number of individuals that have made use of online services compared to the total amount of public services customers (with target of 8% by December 2015).

This survey found that by May 2014 number and variety of administrative public services increase from 108 public services in 2010 to be 154 public services (increase 43% in four years), consisting 101 license services and 53 non-license services, provided by 19 of 37 government departments (51% of all government departments). Administrative public services are public services that produce any documents for public, such as birth certificate, family card, and identity card.

In terms of the *output* indicators, among 154 available administrative public services, 51 public services have been supported by Computer-Based Information Systems (CBIS) with 20 public services (20%) have been delivered online and integrated into a Single Point of Access (SPA) system called "Surabaya Single Window". If the local authority has a target to develop five new online services every year or 20 online services by December 2014, this target has been accomplished in May 2014, so government should be confident to achieve 25 online services in the end of 2015. Figure 1 presents the data.

Regarding the *usage* indicators, however, this survey has difficulties to find the usage data. Among the 20 online services, there are just 8 online services that have recorded and provided information about use; usage data of the other 12 online services are not available. It indicates that government's policy has not supported for record and evaluation standard procedure, particularly on usage information. According to the available data, there is just one public service that successfully achieved usage target: a license service for cultural preservation provided by Department of Culture and Tourism, that is 14% of all customers have used online service. Usage data of the other online services are less than 7% or not available. It suggests that the city of Surabaya has not achieved their e-government usage target yet.

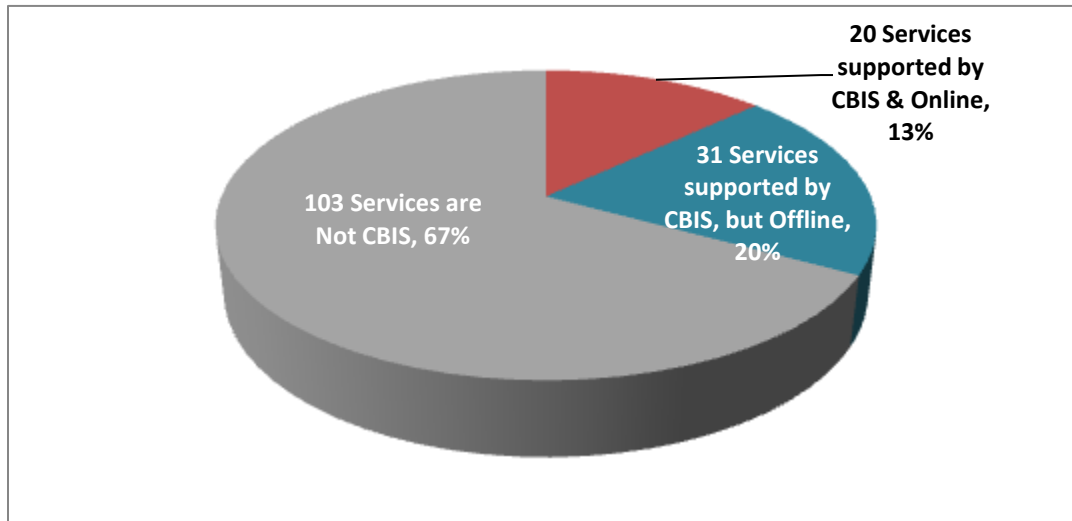


Figure 1. The output indicators of Surabaya's e-government by May 2014

From e-government supporting aspects, the survey also revealed that most public sector organizations in Surabaya city still have problems in IT staff and infrastructure. Twenty-one departments (57% of all government departments) have not had IT staff and most of them (81%) are outsourced staff. The sustainability and security of e-government systems are more risky when they are operated and depending on outsourced staff. In terms of IT infrastructure, there are 16 departments (43% of all government departments) that have not had a server as the main IT infrastructure for online services. There is also a big discrepancy in IT infrastructure among government organization that hinders the implementation of e-government at all government organizations.

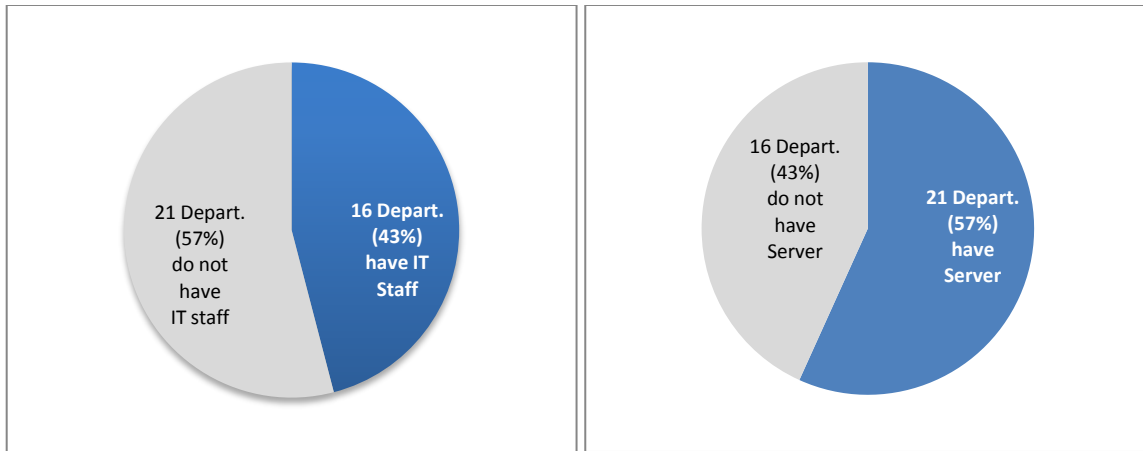


Figure 2. The environmental indicators: available IT Staff and server at all departments by May 2014

Overall, this study reports that local authorities in Indonesia measure e-government success based on an *output* indicator (i.e. percentage of online public services compared to all available public services) and a *usage* indicator (i.e. percentage of number of individuals that have made use of online services compared to the total amount of public services customers). However, measuring the usage indicator is still an issue since policy and standard procedure for monitoring usage of the online services has not been determined. In fact, the *output* e-government indicators alone are not enough to represent an e-government success. In this case study, even the *output* indicators have a good score, *usage* and *supporting* indicators do not show good descriptions of e-government. Particularly, when we look closer on the *output* data, the 20 online public services, in fact, are developed and provided by just 9 departments of 37 departments. The total number of online services at a city level does not represent e-government success and capability of each government organization. The high total number of online services may be developed and provided by just one or two advanced government departments. It supports a recommendation that the supply-side e-government indicators (the *input* and the *output* indicators) should be complemented by the demand-side indicators (the *usage* indicators and the *impact* indicators). The *environmental* indicators should also be measured in order to support e-government development and acceptance.

## 5. Conclusion

This study suggests that number and variety of public services typically increase by years, so it should be considered when the local authority formulates e-government indicators and determines the target levels. In case of Indonesia, local authorities refer the amount of available online public services and their usage as the indicators of e-government success. The city of Surabaya, as the object of this case study, has achieved their target on the amount of online services, but they have not successfully achieved their usage indicator target. Most data on e-government usage are not available since regulation and standard procedure for monitoring system usage have not been established. Since the amount of online services alone does not represent e-government success, the supply-side e-government indicators should be weighed together with the demand-side indicators. The Lack of IT staff and IT infrastructure are two main issues facing implementation of e-government among public sector organizations in Indonesia. Such obstacles can be identified if the local authority also measures the e-government *environmental* indicators.

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