E-Readiness Model for its Adoption in District Government Institutions

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Abstract

One of the biggest challenge faced by government institution lying on readiness level of information technology (e-Readiness) being adopted. The aims of this study is to produce E-readiness model for assesment of Information Technology adoption in Government Institution. This study used Design Science Research Methodology (DSRM) using 7 enablers of COBIT 5 as variables by participating government institution in Bandung District. The analysis was performed on 7 enterprise enabler namely behaviour, information, application and infrastructure services, skills and competencies of Human Resources, while interviews, observations, and quuestionnaire was conducted during data collection. The results revealed Business Process, Organization Structure, Culture, Ethic and Behaviour, information and skill and competence have significantly affect e-Readiness of IT adoption in government institution of Bandung District.

Keywords: *e-Readiness, Government, COBIT 5, IT Adoption*

1. Introduction

Information and Communication Technology (ICT) has become an increasingly important factor for the development of one country. For the past two decades, ICT have been introduced in government sectors in regards on operational efficiencies and effectiveness [1]. While the major barrier to the e-government adoption is mainly on readiness level of particular country in terms of ICT infrastructure and deployment.

e-Readiness of ICT adoption has become a crucial tool or policy in government institution, it is enhances citizens trust through implementation of good corporate government principles. The use of IT in organizations is a dynamic interaction between the process of technological innovation that leads to new IT applications and reinvention of existing applications, and the process of organizational innovation that consists of the actual adoption and implementation of an IT application in an organization, the use of these applications affects both processes and communications within organization [5].

E-Government Readiness is the state where one government institution including stakeholders are being well prepared for the adoption and utilization of the new technology. This state might include one or more of the following conditions, such as the persistance of one individual to accept changes from traditional manual processing into the modern computerized working system [6]. At the end, the implementation of e-government is influenced by the degree of readiness of technology adoption. Therefore, having e-Readiness Model for Technology Adoption in Government Institutions would help one institution to assess the readiness level and plan for the future before adopting new technology.

2. Literature Review

2.1. e-Readiness concept

The United Nations University stated that eReadiness measures how well a society is positioned to utilize the opportunities provided by ICT, where ICT infrastructure, human capital, regulations, policies and internet penetration are all crucial components of e-readiness. [2]. e-Readiness is the ability to pursue value creation opportunities facilitated by the use of the Internet [3].

Some countries have a variety of reasons and motivations for adopting ICT in preparation for implementing a new economy. One of the reasons and motivations is based on the desire to benefit from the use of ICT in digital economic competition. That is why some countries have a concentration to increase their citizens in readiness to adopt ICT.

There is four model of e-Readiness [4]:
1.   Ready to use tools, is ready-to-use assessment tools that available on the internet.
2.   Case Studies is assessment tools that developed by a case study based in several countries.
3.   Third party surveys and reports are surveyed model and e-Readiness rank report that develops by third party organization such as IT consultant or IT vendor.
4.   Others e-Readiness assessment models, is another assessment model that not include in third category above.

2.2. E-Government Readiness

E-Government Readiness refers to the ability of government to successfully implement and carry out government services over the Internet [7]. E-Government Readiness with a wider range as "a measure of the degree to which a country, nation or economy may be ready, willing, or prepared to obtain benefits which arise from information and communication technologies (ICTs) [8

2.3. COBIT 5: 7 Enterprise Enabler

Control Objectives for Information and related Technology (COBIT) is one of the standards used in information technology governance.
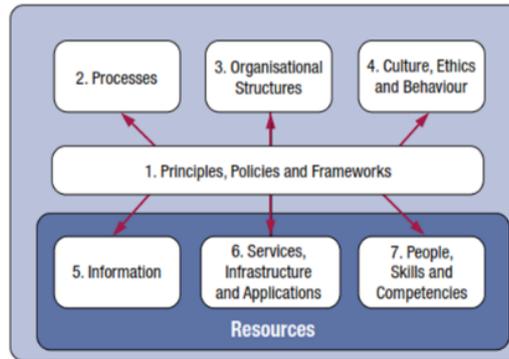
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Fig 1: COBIT 5 Enabler [13]

COBIT developed by Information Systems Audit and Control Foundation (ISACF) which since 1999 turned into the IT Governance Institute (ITGI) and the Information Systems Audit and Control Association (ISACA). Until now COBIT has reached 5th version. COBIT 5 as a business framework and IT alignment separates governance and IT management in organizations, COBIT 5 describes the 7 components of the "enablers" (Figure 1) described as something that can help the process of achieving the objectives of IT governance in organizations, including the resources, such as information and people.

3. Method

Our research follows the Design Science Research Methodology (DSRM). There are six steps in the DSRM process, problem identification, and motivation, the definition of the objectives for a solution, design and development, demonstration, evaluation, and communication. (Figure 2):
Problem Definitions
Problems identification of information technology adoption in Bandung district will be carried out through interviews with the Head of Agency for the management of archives, libraries and information systems Development (BAPAPSI) as IT Unit organization
Defining Solution
The literature review based on research papers related to IT adoption is used as the basis for identifying solutions to be proposed. It aims to get what factors are usually considered in adopting a technologically
Design and Model Development Demonstrations
At this stage, it will be made a model for the e-Readiness of information technology adoption in Bandung district based on the factors that influence.
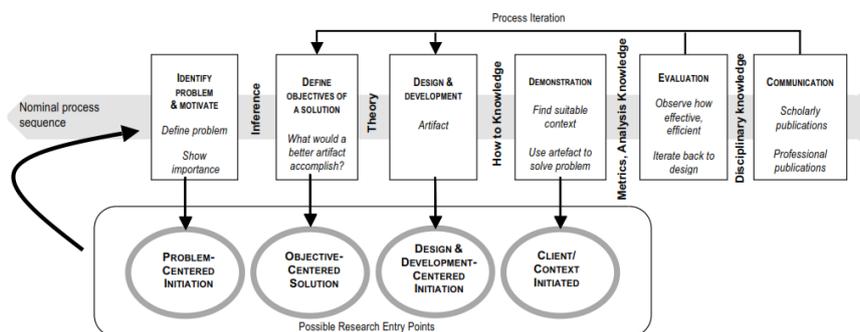

Fig. 2: Design Science Research Methodology [9]

Demonstrations
A quantitative approach will be used to test the Readiness IT Adoption model that will be produced. The questionnaire was developed based on the factors that influence the information technology adoption. It aims to obtain a major factor and a contributing factor in adopting the information technologies using factor analysis.
Evaluation
Testing evaluation from the previous stage will be used as a reference for the IT adoption Readiness model in district of Bandung
Communication
The communication process of the model produced will be delivered through a journal or conference. A research report will also be submitted to DISKOMINFO.

4. Analysis and Design

The hypothesis shown in Figure 3, designed based on the predictor and response variables COBIT 5 enabler dimensions
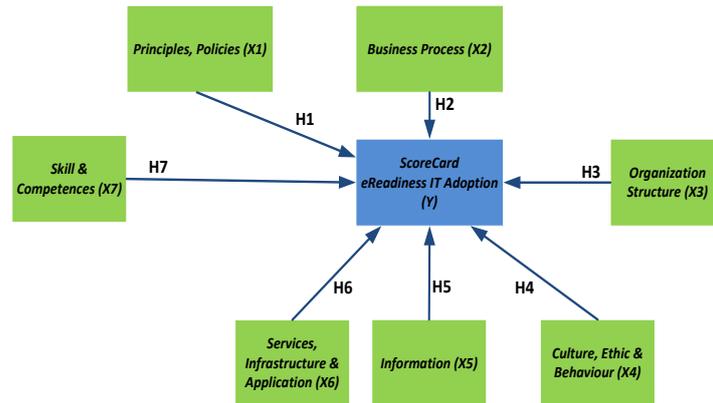

Fig 3. Hypothesis Model

1)   Hypothesis 1
a)   H0: the Readiness of IT adoption independent to the principles and policies
b)   H1: the Readiness of IT adoption dependent to the principles and policies
2)   Hypothesis 2
a)   H0: the Readiness of IT adoption independent to the business process
b)   H1: the Readiness of IT adoption dependent to the business process
3)   Hypothesis 3
a)   H0: the Readiness of IT adoption independent to the organizational structure
b)   H1: the Readiness of IT adoption dependent to the organizational structure
4)   Hypothesis 4
a)   H0: the Readiness of IT adoption independent to the culture, ethics, and behavior
b)   H1: the Readiness of IT adoption dependent to the culture, ethics, and behavior
5)   Hypothesis 5
a)   H0: the Readiness of IT adoption independent to the information
b)   H1: the Readiness of IT adoption dependent to the information
6)   Hypothesis 6
a)   H0: the Readiness of IT adoption independent to the services, infrastructure, and application
b)   H1: the Readiness of IT adoption dependent to the services, infrastructure, and application
7)   Hypothesis 7
a)   H0: the Readiness of IT adoption independent to the HR skills and competencies
b)   H1: the Readiness of IT adoption dependent to the HR skills and competencies

4.1. Proposed Model of Readiness It Adoption

A proposed model of e-Readiness IT adoption by referring 7 enterprise enabler COBIT 5 will be assessed using maturity level assessment models as shown in Figure 4. The scale of IT adoption readiness is based on the measurement of each company enabler variable mapped as follows, a scale of 0-3 means Not Ready to Adopt IT while a scale> 3-5 means Ready to Adopt IT. The proposed model of e-Readiness Adoption of Information and Communication Technology (ICT) in Bandung district illustrated in Figure 5.
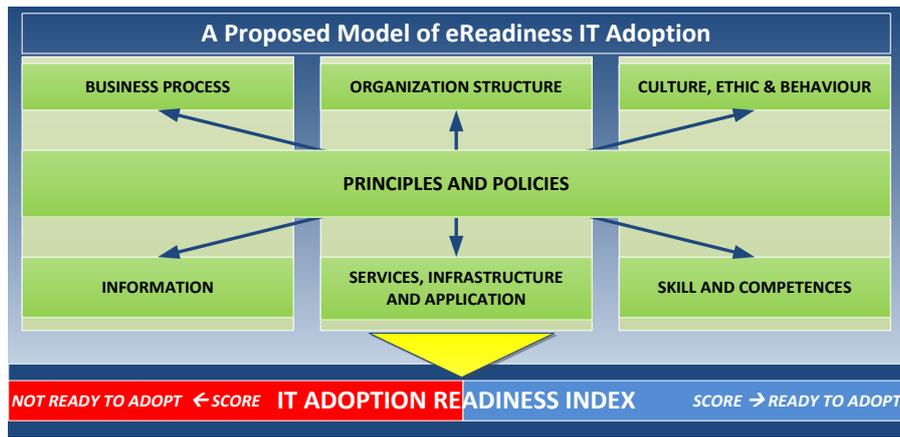

Fig. 4: Maturity Level Index

Fig. 5: A Proposed Model of e-Readiness IT Adoption

5. Results

Pearson correlation used to indicate the direction, strength and significance of relationships in the study. In this study Principles and Policies correlated with E-Readiness of IT adoption ($p<.01$; $r>.41$). Business Process positively correlated with E-Readiness of IT adoption ($p<.01$; $r>.41$). Organization Structure positively correlated with E-Readiness of IT adoption ($p<.01$; $r>.41$). Culture, Ethic and Behavior positively correlated with E-Readiness of IT adoption ($p<.01$; $r>.41$). Information positively correlated with E-Readiness of IT adoption ($p<.01$; $r>.41$). Skills and Competencies positively correlated with E-Readiness of IT adoption ($p<.01$; $r>.41$). The correlations results for all variables in this study depicted in Table 1 below.

Table 1: Correlation

Correlations

		Principle and Policy	Business Process	Organization Structure	Culture, ethic and behaviour	Information	Services, Infrastructure and Application	Skill and competence	e-Readiness IT Adoption
Principle and Policy	Pearson Correlation	1	.502**	.377*	.389*	.453*	.260	.376*	.512**
	Sig. (2-tailed)		.004	.037	.031	.010	.158	.037	.003
	N	31	31	31	31	31	31	31	31
Business Process	Pearson Correlation	.502**	1	.560**	.594**	.597**	.395*	.398*	.552**
	Sig. (2-tailed)	.004		.001	.000	.000	.028	.027	.001
	N	31	31	31	31	31	31	31	31
Organization Structure	Pearson Correlation	.377*	.560**	1	.447*	.503**	.459**	.445*	.504**
	Sig. (2-tailed)	.037	.001		.012	.004	.009	.012	.004
	N	31	31	31	31	31	31	31	31
Culture, ethic and behaviour	Pearson Correlation	.389*	.594**	.447*	1	.581**	.253	.489**	.520**
	Sig. (2-tailed)	.031	.000	.012		.001	.170	.005	.003
	N	31	31	31	31	31	31	31	31
Information	Pearson Correlation	.453*	.597**	.503**	.581**	1	.240	.609**	.417*
	Sig. (2-tailed)	.010	.000	.004	.001		.194	.000	.020
	N	31	31	31	31	31	31	31	31
Services, Infrastructure and Application	Pearson Correlation	.260	.395*	.459**	.253	.240	1	.515**	.190
	Sig. (2-tailed)	.158	.028	.009	.170	.194		.003	.305
	N	31	31	31	31	31	31	31	31
Skill and competence	Pearson Correlation	.376*	.398*	.445*	.489**	.609**	.515**	1	.443*
	Sig. (2-tailed)	.037	.027	.012	.005	.000	.003		.013
	N	31	31	31	31	31	31	31	31
e-Readiness IT Adoption	Pearson Correlation	.512**	.552**	.504**	.520**	.417*	.190	.443*	1
	Sig. (2-tailed)	.003	.001	.004	.003	.020	.305	.013	
	N	31	31	31	31	31	31	31	31

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Hypothesis 1
Principle and policy of obtaining a correlation coefficient r = 0.512> r table (0.355) and the Sig = 0.001< α (0.05) shows the relationship between the variables principle and policy with the e-Readiness of IT adoption. So H0 is rejected, whereas H1 that there is a significant relationship between the variables principle and policy with the variable of e-Readiness IT adoption accepted.
Hypothesis 2
Business process of obtaining a correlation coefficient r = 0,552 > r table (0,355) and the Sig = 0.003 <α (0:05) shows the relationship between the variables business process with the e-Readiness of IT adoption. So H0 is rejected, whereas H1 that there is a significant relationship between the variables business process with the variable of e-Readiness IT adoption accepted.
Hypothesis 3
Organization structure of obtaining a correlation coefficient r = 0,504 > r table (0,355) and the Sig = 0.004< α (0.05) shows the relationship between the variables organization structure with the e-Readiness of IT adoption. So H0 is rejected, whereas H1 that there is a significant relationship between the variables organization structure with the variable of e-Readiness IT adoption accepted.
Hypothesis 4
Culture, ethic and behaviour of obtaining a correlation coefficient r = 0,520 > r table (0,355) and the Sig = 0.003< α (0.05) shows the relationship between the variables culture, ethic and behaviour with the e-Readiness of IT adoption. So H0 is rejected, whereas H1 that there is a significant relationship between the variables culture, ethic and behavior with the variable of e-Readiness IT adoption accepted.
Hypothesis 5
Information of obtaining a correlation coefficient r = 0,417 > r table (0,355) and the Sig = 0.02< α (0.05) shows the relationship between the variables information with the e-Readiness of IT adoption. So H0 is rejected, whereas H1 that there is a significant relationship between the variables information with the variable of e-Readiness IT adoption accepted.
Hypothesis 6

Services, infrastructure and application of obtaining a correlation coefficient r = 0,190 < r table (0,355) and the Sig = 0,305 > α (0.05) shows there are no relationship between the variables Services, infrastructure and application with the e-Readiness of IT adoption. So H0 is accepted, whereas H1 that there is a significant relationship between the variables services, infrastructure, and application with the variable of e-Readiness IT adoption rejected.

Hypothesis 7

Skill and competence of obtaining a correlation coefficient correlation r = 0,443 > r table (0,355) and the Sig = 0.013< α (0.05) shows the relationship between the competence and skill variables with the IT adoption readiness. So H0 is rejected, whereas H1 accepted, because has a significant relationship between the competence and skill variables with the IT adoption Readiness.
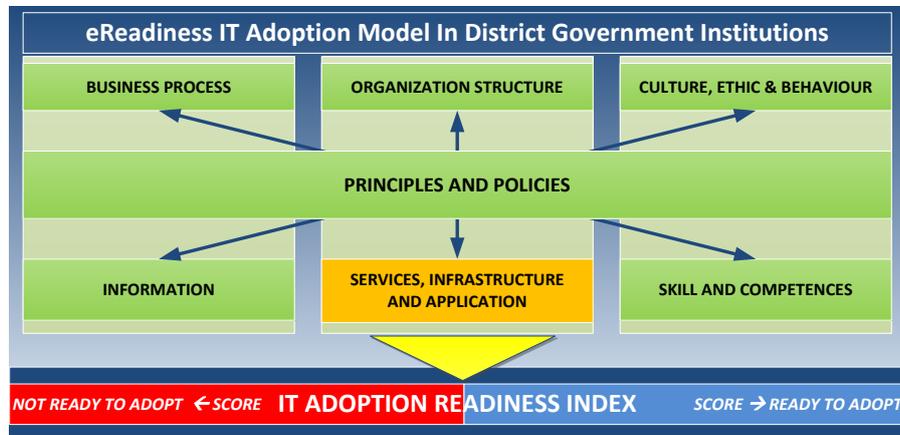

Fig. 6: e-Readiness IT Adoption Validated Model

The e-Readiness IT Adoption Validated model divided into two enabler groups. The first is Main Enabler group that consists of variables: business process, principles and policies, organizational structure, cultural, ethics and behavior, information as well as the skill and competence (Figure 6). The last is Support Enabler which consists of variables: infrastructure & application and services.

6. Conclusion

The research conclusions from the IT adoption readiness model can be explained as follows:

E-Readiness of IT Adoption model can be used as a reference for one government institution to assess the readiness level before adopting new technology to support day to day business processes.

From seven enterprise enablers validated in this study, the e-Readiness of IT Adoption Model for Government Institution in District area consists six main enablers and one support enabler.

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