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MODELING SERVICE ORIENTED COMPUTING FOR GREEN IT GOVERNANCE IN G-READINESS FRAMEWORK

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Abstract

Green IT implementation in Indonesia nowadays is just another dream for many companies. However, if top level management can be ensured that having Green IT implementation is not just helping mother earth to breathe longer, but also giving more efficiency, than top level management will support it. One of the way to ensure them is by modeling a model that can be implemented easily. This paper propose Service Oriented Computing (SOC) model to make lower energy consumption and better performance. Thus, it will help to give better awareness of Greent IT implemenation for top level management. This kind decision from top level management should be included in IT governance and should become the startup step for having Green IT implementation for the company. Green IT implementation in company commonly measured by a framework of G-Readiness, therefore the SOC model is supposed to be one small step in Green IT governance toward the framework

Key words: Service Oriented Computing, Green IT, G-Readiness, IT Governance

1. Introduction

The need of fulfilling green movement has already incorporated many parts of everyday life including IT aspect. However, people still believe that green movement in IT aspect has only become an utopia nowadays (Chow and Chen, 2009). It just because paradox point of view that still see **6** as big energy consumer and hardly reduced it.

The past decade has seen many businesses realize the long term effects of pollution and taking responsibility for their actions through social and environmental responsibility initiatives in ways **5** that improve their environmental footprint. As IT plays an integral role in almost all facets of businesses, and as each stage of the IT lifecycle from manufacturing to usage and disposal can pose environmental damages it naturally follows that demands for CSR and “environmental sustainability” should be extended to IT too (Molla et al, 2009; Educaus **9** 2010).

Estimates indicate that ICTs account for 2% of global CO2 emissions, which is equivalent to the amount generated by the

aviation industry (Poniatowski, 2010). On the other hand, **8** empirical research in US only has stated that nearly 82 billion lbs of CO2 equivalent are released as a result of the electricity used **12** U.S. servers and data centers annually (Molla et al, 2008). Thus, the importance of Green IT implementation should become a key point for any IT managers in order to make Mother Earth breathe happier

On the other hand, western part of the world has already paid attention of this subject. One of proofs is the statement of G-Readiness Framework that become a semi formal measurement of a company or institution in implementing green movement of IT (Molla et al, 2008). Though G-Readiness Framework still being questioned in its implementation, the framework itself has become one of IT management attitude measurement in Australia and Oceania (Molla et al, 2009; Connection Research, 2009).

In Indonesia, there is no valid proof which can be mentioned clearly that any corporate or institution already be concerned with G-Readiness. While many IT managements still struggle with their person

behavior and also their infrastructure efficiency, actually there is some features from G-Readiness Framework that can be set up immediately to help Mother Earth live longer.

One of its simple implementation is using Service Oriented Computing (SOC) that can help lower power consumption as well as infrastructure efficiency. Service Oriented Computing that can handle disconnected data concept also can give better performance for data server. Thus, its implementation should really help any corporate to start preparing themselves in fulfilling G-Readiness Index.

However, before implementing the proper SOC to support green movement of IT, there should be a model of SOC that can go with Indonesian IT condition. Therefore, this paper tries to model a proper SOC in order to prepare for G-Readiness as well as great efficiency in common IT implementation in Indonesia

2 Literature Review

2.1 Service Oriented Computing

A service is the product of human, organizational, or computational activity meant to satisfy a need, but not constituting an item. Service Oriented Computing itself provides the tools to model the information and relate the models, construct processes over the systems, assert and guarantee transactional properties, add in flexible decision-support, and relate the functioning of the component software systems to the organizations that they represent goods (Singh and Huhns, 2005).

SOC usually also related with SOA (Service Oriented Architecture) which enabling framework for integrating business processes and supporting information technology infrastructure as loosely coupled and secure, standardized components — services — that can be reused and combined to address changing business priorities (Lawler and Howell-Barber, 2008). Thus, core keyword from SOC in an information system implementation is flexibility (Singh and Huhns, 2005).

2.2 G-Readiness

G-Readiness is an organization's capability as demonstrated through the combination of attitude, policy, practice, technology and governance in applying environmental criteria to its IT technical infrastructure as well as within its IT human infrastructure and management across the key areas of IT sourcing, operations and disposal to solve both IT and non-IT (by using IT) related sustainability problems. (Molla et al, 2009). On the other hand, an independent institution from Australia called Connection Research also developed Green IT Readiness Index (GrITx) that comes from term of G-Readiness (Connection Research, 2009).

G-Readiness itself consists of five major components which are (Molla et al, 2009)

- a. Green IT Attitude
- b. Green IT Policy
- c. Green IT Practice
- d. Green IT Technology
- e. Green IT Governance

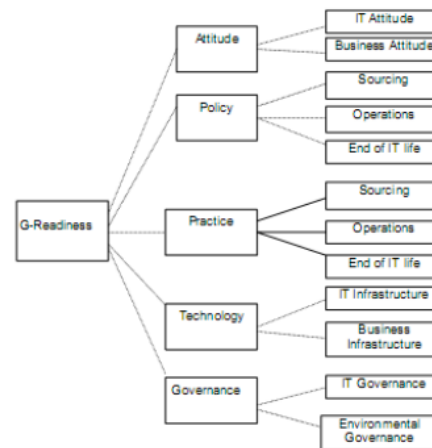


Figure 1. G-Readiness Framework (Molla, 2008)

Focus in this research is Green IT Governance that leads to the operating model that defines the administration of Green IT initiatives. Should a business assign the

responsibility for Green IT initiatives to CIO's, or should it come under environmental managers? Should IT organisations be held responsible for electricity costs and accountable for energy efficiency? Answers to these and similar questions define the governance dimension of Green IT (Molla et al, 2008).

Green IT Governance also includes strategic foresight from IT manager to make an information system become more efficient and support eco-sustainability (Molla et al, 2009). This strategic foresight should guide the software development process into a proper model for keeping earth less suffer.

Thus, what is the meaning of IT Governance ? IT Governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organization's strategies and objectives (Lee, 2008)

3. Model Prototyping.

When a question shown up about reason of choosing SOC as one of startup step in Green IT Governance, then it should be answered using two words : flexibility and efficiency. SOC that theoretically and practically can handle cross platform and also cross language development will create easiness for any developer team to build virtualization in their software development process. While SOC also can make data server become more idle (that means using less power) since that some of processes will be handled by desktop rather than taking whole process in server.

The main problem in implementing SOC for many software developers in Indonesia is merely based on lack of knowledge about SOC itself. However, most of them actually can implement it simply by knowing the right model for SOC. Thus, as stated before that eventhough many IT managers assume that Green IT

implementation is only a utopia, in fact they really need it and in contrary they actually can implement it easily.

Many SOC model that comes with virtualization concept stated that it will need many data servers which are spread up into many places (Singh and Huhns, 2005). This assumption will not suitable against the real condition in Indonesia since that many small-medium enterprises (SME) typically only have one or two servers in their rack. Thus, there should be another model that can represent the "real condition" in Indonesia that can implement SOC.

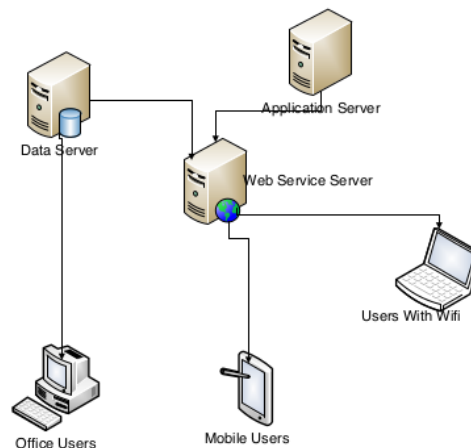


Figure 2. Model Architecture

Core implementation of SOC is the usage of Web Service in an information system. However, the model that presented in figure 2 is different with "ordinary" SOC model. Commonly, SOC will put a Web Service server inside the company and will act as permanent bridge to connect all type of users. Thus, it will make SOC implementation need more servers as well as more energy consumption.

In proposed model, Web Service Server actually hosted outside the company as another dedicated web hosting server. This little trick should have greater efficiency toward green IT concept. On the other hand, this concept still a wishful thinking for many IT departments in Indonesia. Since that many

IT managers still hesitate about the security of web hosting server and many of them also doubtful that dedicated web hosting server will give them efficiency rather than administering own server.

In proposed model, Web Service Server will lightening data and application server load. This could happen because of users that come from outside office, especially that access application beyond office hour, will redirect to web service server. Thus, using disconnected concept in its application, servers that located in office can work in power-saving mode while its not in busy office hour. This condition should have great efficiency in energy consumption and also reducing risk that can happen whenever there is no administrator outside office hour.

Despite of all the hesitation, the decision of implementing this concept need great commitment. The commitment does not come from the IT manager, however, the commitment should come from top level of management that must concern about how mother earth suffer from greater energy consumption. That is the main reason why this model should be considered as IT Governance in preparing a company to have better G-Readiness.

Because most of company in Indonesian still ignoring the importance of Green IT, it is still a dream to have "real" Green IT infrastructure. However, when presenting this model and ensuring top level management that Green IT implementation is not just important for mother earth, but also for company, at least it can change the paradigm from top level management and also change the policy of IT governance in the company

4. Conclusion

- a. While many countries already start to have G-Readiness measurement in company that using IT as its core supporting business, Indonesian government perhaps never know about this measurement.

- b. In order to start to implement G-Readiness framework in Indonesia, it should start from top level management, thus it must be initiated from IT governance rather than IT attitude. Since that the awareness of Green IT implementation in Indonesia is very low, thus it need "real power" to make it happen.
- c. One of the way to ensure top level management in Green IT efficiency is through SOC modeling that can give efficiency as well as lower energy consumption.
- d. The proposed model is just the beginning and should be more detail for each company, however, it should become a great beginning in raising awareness of Green IT importance in real life.

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