Influence of Organizational Culture on Green IT Adoption: Study Literature

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Abstract*—Green IT (Information Technology) becomes one of the latest considerations to increase environmental sustainability and reduce the cost of Information Technology operation. However, the successful adoption of Green IT needs Green IT readiness measurement taken for the considerations of organizations leader. Green IT readiness focused on capability and maturity the Green IT effects on the organization. G-Readiness Molla was the integrated framework that usually used for Green IT Readiness. G-Readiness framework had five important dimensions, which were attitude, policy, practice, technology, and governance. Without considering how organization culture affected Green IT adoption. This research purpose was to build the appropriate model for inspecting the effect of organizational culture on the five dimensions of Green IT Readiness, that was Green IT Attitude, Green IT Policy, Green IT Practice, Green IT Technology, and Green IT Governance. Based on our literature review, we proposed a hypothesis: organizational culture was one of the key determinant factors in Green IT Readiness. Thus we updated the G-Readiness Molla framework by adding organizational culture as one of its dimensions.

Keywords*—Green IT, Green IS, Green IT Readiness, Capability, Environmental Sustainability, Organizational Culture.

I. Introduction

The influence of using IT in environmental issues has two sides of the blade. On one side, IT is one solution and tool to solve environmental problems. The other side, IT has a negative impact on participating in causing global warming. This has become an important issue faced by several countries. According to M. O'Neill's [1] research, Information Technology has a contribution to greenhouse gas emissions, with approximately 2% of the emissions of carbon dioxide. The impact of IT on and its role in ecological sustainability, under the headline of Green IT, has emerged as the key to IT management issues [2].

Nowadays Green ICT is an important issue for many companies and organizations in the world. According to a survey report of 426 companies in North America and 1,052 companies worldwide, 86% of companies consider that it is important to adopt Green IT "[3]. Green IT or otherwise known as Green Computing is the organizational ability to systematically apply environmental sustainability criteria (such as pollution prevention, product handling, use of clean technology) to design, produce, use the ICT infrastructure exhaust resources as well as the human and managerial components present in ICT infrastructure [4].

The most important part of the issue of green IT systems development lies in user engagement. Leidner and Kayworth [5], show gaps between established values in the system with user-grade values can lead to conflicts that hinder adoption and success. This gap can be reduced by paying more attention to organizational culture factors. Organizational culture is one thing that can affect how Green IT should be applied to an organization. The organizational culture according to Denison (1998) are the values, beliefs and basic principles that form the basis for systems and management practices and behaviors that enhance and reinforce these principles.

Organizational culture has a major impact on the application of Green IT [6]. Organizational culture is related to Green IT adoption [7]. Therefore, cultural aspects are needed as input to develop Green IT. The importance of environmental issues and the potential of IT in advancing ecological sustainability, research in Green IT adoption is essential. Previous researchers who have adopted Green IT adoption readiness [8] are still lacking because there is no research that leads to how culture can influence the adoption of Green IT especially in assessing the readiness of companies or organizations. Assessing readiness is useful for understanding and identifying the most important opportunities related to Green IT, so it is used as a basis for determining vision, strategy, and priorities.

This study provides a conceptual model of green IT adoption readiness, which can be considered from the literature review that has been done. Conducting literature review literature on the development of green IT readiness research can provide new research opportunities to prove the conceptual model of green IT readiness in this paper.

II. Literature Review

The study of the theory discusses the basic theories and concepts related to research in order to obtain theoretical construction foundation as a guide and benchmark of research. The theoretical studies of this study include online Green Technology Information and organizational culture theory

A. Green IT Readiness

Molla et al. [8], purposed in an integrated framework used to measure the readiness and success level of adopting green IT in certain of the organization. The work provides a Green Readiness model which is intended for organizations to measure the readiness of Green IT implementation in

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their companies. The authors explained that the Green Readiness model has five measurable components, as the key to the successful implementation of Green IT, such as Attitude, Policy, Practice, Technology, Governance. Although each component has their own scope, these component are strongly related.

There are considering one separate component will result in inefficient green IT readiness assessment. Addressing the five component, we can help the organization to determine the weak element green IT adoption. The five component are:

1) Green IT Attitude

Attitude is one of the Green IT components with it refer intangible characters to the quality of human resources from business leader and IT professional leader. Attitude is something that is hard to recognize Green IT Attitude refers to the quality of human resources of a business leader and IT professional leader. Environmental and social awareness level related to IT usage. Attitude as one of the main factors that affect the acceptance and use of technology will have a great chance to affect the implementation of Green IT. Those elements will measure the level of IT and business are aware of and interested in economics, strategy, regulatory, environmental and social issues related to IT usage. By measuring Green IT Attitude, we can help understand to the subjective motivation and the capabilities of IT leaders and business leaders.

2) Green IT Policy

The policy includes an organizational framework used to implement environmental criteria on IT-related activities. It measures the degree of environmental issues being covered in organizational guidance procedures for purchasing, using and disposing of IT and HR infrastructure. There are three domains discussed in the policy, among others: IT sourcing policy, IT operation and services and IT end of life management

3) Green Practice

The dimensions of practice include three domains such as green IT sourcing, green IT operation and services, green IT end of life management. The first dimension considers environmental factors in IT policy making and decision making. The second dimension involves critical human, client, server, and physical network infrastructures. At the client level, we enable the user to control power consumption by slowing down the processor, turning the disc and shutting down the monitor and reducing the carbon footprint. The end of life management refers to the lifetime of ICT equipment. The organization shall have a policy of expired ICT equipment, whether to reuse equipment that can be used or donated to a party in need or returned to producers for recycling. Avoid throwing ICT waste in the trash because it can endanger health and the environment.

4) Green IT Technology

Dimensions of Green IT Technology refers to Technology and Information Systems which can be used for: a). reducing energy (b) optimizing energy efficiency from IT technical infrastructure, c) reducing greenhouse gas emissions from IT use d) changing business practices that produce carbon, the overall environmental footprint. For example, SAP Recycling Administration Application. Green IT is also linked to environmentally friendly technologies and environments. The main driver of the success of technology readiness by building environmentally friendly technology infrastructure. Green IT technology has four subcomponents in it: IT technical infrastructure, airflow management, cooling system, and power delivery.

5) Green IT Governance

Green IT Governance refers to the management infrastructure to implement Green IT. It is related to businesses manage their environmental and social responsibilities influence the role of CIO in Green IT initiatives. This model defines an eco-friendly governance. In which a Green IT needs a good infrastructure to understand the impact, action, and management of the company. Green IT governance consists of two subcomponents namely strategic foresight and resource and metric.

B. Organizational Culture

Organizational culture is a combination of commitment, beliefs, and values shared among organizational members and can describe part of the external environment of the organization [9].

According to Denison, corporate culture has an influence on the effectiveness of an organization. Denison [10] stated that there are four dimensions of organizational culture which are believed to be related to the level of organizational effectiveness.

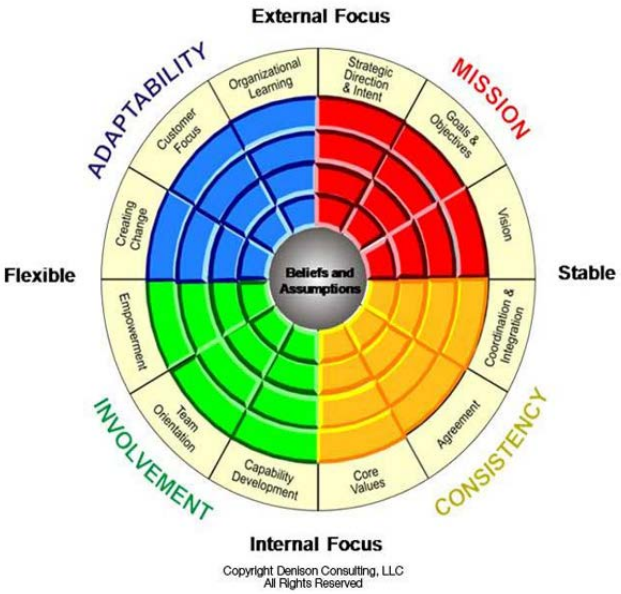

Figure 1. Denison Organization culture [10]

The four dimensions of that culture are Involvement, Consistency, Adaptability, and Mission.

The Denison model answered the four essential elements that exist within the organization.

1) Involvement

Involvement is an organizational culture dimension that indicates the participation level of organization members [11]. High level of involvement and participation of employees will enhance the sense of responsibility. That sense of belonging and responsibility will increase employee commitment to the company thus it does not require open control. By this high sense of engagement, it also expected to increase a sense of togetherness and kindship, as those things are important in helping to complete the job.

2) Consistency

The dimension of consistency shows the agreement level of an organization member against the basic assumptions and core values of the organization. Consistency emphasizes the values that the company has that needs to be understood by the members of the organization. These values comprise communication problems, cooperation in doing the job, tolerance, and reward of achievement. These have a positive impact on the process of achieving organizational goals and consistently need to be built or developed within the company. Cooperation in carrying out the work should be familiarized, as it will help in facilitating the achievement of goals. Appreciation of achievement should be created in a good and appropriate form in order to be a motivation at work.

3) Adaptability

Adaptability is the organization's ability to respond to some changes in the external environment by making an internal change in the organization. These changes can be technological developments, changes in economic and political conditions, changes in quality and employee attitudes, and also consumer demands on the company's production. Adaptability is not only necessary for company survival but also as a challenge for enterprise development.

There are three aspects of adaptation that can affect organizational effectiveness: 1.)The ability to be aware of and react to the external environment; 2.) The ability to be aware of and react to the internal environment; 3.)The ability to react to internal and external stakeholders.

All of these three aspects are the result of development and also a combination of assumptions, values, and basic norms that have an impact on structure and direction for the organization.

4) Mission

The mission is a cultural dimension that shows the organization's core objective which makes the organization members steadfast and focuses on what is considered important by the organization [11]. Successful organizations have clear goals and directions This emphasizes the importance of mission clarity and organization purpose for its members. Some experts claimed that the notion of mission provides two major influences on organizational functions:

a. A mission provides usefulness and meaning that determines the social role and extra purpose of an institution and determines the individual roles of the institution. This internalization and identification process provides both short-term and long-term commitment and leads to organizational effectiveness.
b. Understanding the mission will provide clarity of direction at the individual level, they believe that the organization's success requires coordination which is the result of setting common goals.

III. Research Objective

The purpose of this study is to find out how the development of research green IT. The result of this study is a conceptual model of the green IT readiness.

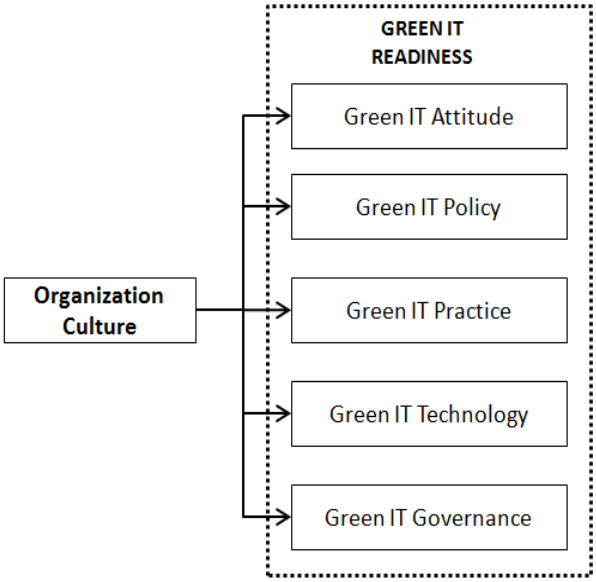

Figure 2. Conceptual Model

The conceptual model can be implemented in the next research to test the validity of the conceptual model that has been designed.

IV. Results and Discussion

The model to be developed in this research will be described as a conceptual framework a thorough explanation of the theory that became the basic reference of the study in which the theory is combined with the results of existing research so that ideas can be obtained further (Figure 2).

The main objective of this research is to analyze the relationship between Organizational Culture and Green IT Readiness. Several previous studies have shown that there is a strong relationship between Organizational Culture and Green IT adoption [7]. But in that study, it does not examine the organizational culture relationships in the dimensions of readiness of organizational culture influences not specifically linking the Green IT readiness dimensions. Therefore this study proposed a development model of Green IT Readiness

The focus of this conceptual model is to explore the influence of organizational culture on green IT readiness. The conceptual framework used in this study are the

variables of "Green IT Attitude, Green IT Policy, Green IT Practice, Green IT Technology, Green IT.

A. Proposition 1.

Organizational Culture influence on Green IT Attitude. Green IT Attitude includes managerial attitudes and employee attitudes toward the utilization of IT energy [14]. According to Cushway and Lodge [12], that organizational culture is an organizational value system that will affect the way the work is done and the way employees behave. So if we want to see more of the growing culture of the organization then we can see the behavior that exists within the organization.

Alix G. Kashdan [13] through his research states that Culture affects attitudes and behavior of environmental care. Based on these definitions, it can be understood if the people involved can be responsible.

B. Proposition 2.

Organizational Culture influence Green IT Policy. According to Murugesan and Gangadharan [14], organizations must develop a green IT Policy that is in harmony with the overall environmental policy. Atzenhoffer [15] argues that the formal and informal norms that shape human behavior, affect institutional arrangements. Those elements will have a direct impact on the quality of the environment through the adoption and design of their environmental policies.

C. Proposition 3.

Organizational Culture influence Green IT Practices. Green IT Practices on organizations where IT has been described and implemented by IT [4]. According to [20], Organizational culture is a system of shared values, beliefs and habits that are interconnected with their formal structures to create behavioral norms. According to Wood, Wallace, Zeffane, Schermerhorn, Hunt, and Osborn [16], organizational culture is a trustworthy system and values developed by organizations, where it is done from members of the organization itself.

Abbas's [7] research states that there are organizational changes to Green IT, where the dominant culture in supporting Green IT.

D. Proposition 4.

Organizational Culture influence on Green IT Technologies. Dimensions of Green IT Technology, measuring how an organization has many eco-friendly technologies [4]. According to Webber and Wallace (2009) green technologies are a reduction in the environmental impact of the IT department. The key is to find the right equipment, easy to operate, and easy to process when it cannot be used again.

In some studies of adoption of SI / IT, it has focused on the relationship with theories of acceptance of technology [17]. According to Waarts and Van Evaerdingen [29], culture is one of the key factors affecting IS adoption innovation.

E. Proposition 5.

Organizational Culture influence Green IT Governance. According to Molla et al. [4], Green IT Governance refers to the management infrastructure to implement Green IT. Green IT Governance is an operating model that defines the administration of Green IT initiatives and is closely linked to policy making, rol responsibilities, accountability and controls for Green IT initiatives.

Li and Harrison [18] in his research, found that national culture has a dominant influence on corporate governance structures. According to Beytekin et al [19] cultures can be treated as one of the main subjects that form relationships, work processes, decision making, and problem-solving processes in a university. While Satidularn [20] through his research, states that culture (national culture and organizational culture) is a factor that affects the IT Governance. Culture is one of the things that can affect how IT governance should be applied to an organization [21].

V. SUMMARY

This paper presents the Green IT preparedness model design, aimed at green IT readiness assessment. The design is a development of the Green IT Readiness model [8], taking into account the influence of organizational culture on each Green IT dimension. This paper introduces both the model development process and the resulting model description. However, a detailed description of the indicator is beyond the scope of this paper. Assessment of readiness is the first step in green IT adoption. Serves to help companies manage their improvements and achieve green IT

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