Journal of Soft Computing and Decision Support Systems

Green IS for Sustainable Decision Making in Software Management

Bokolo Anthony Jnr [a,*], Mazlina Abdul Majid [a]

[a] Faculty of Computer Systems and Software Engineering
Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Pahang, Malaysia

* Corresponding author email address: bkanjr@gmail.com

Abstract

Software industries, society and government are becoming increasingly concerned about the impact of the increasing use of IT infrastructure on the environment, especially in terms of energy efficiency, emission reduction and toxic waste. There are few models or frameworks that can assist software practitioners in making decision on how to integrate sustainable green practices in software management process. Thus this paper contributes and studies on the use of information systems to support sustainability in software industries known as "Green IS" and provides a preliminary insight into the utilization and integration of sustainability in software management process as well as the variables that influence eco-environmental practices by proposing a model that will assist decision making for sustainable software management process. Thus contributions of Green Information Systems (IS) to the objectives of software management process are examined by exploring secondary data from literature. Findings from this paper show how the proposed model contributes to sustainable software management process. The proposed model provides software developer, software managers, and other software practitioners with new insights and enables a more systematic application of sustainable practices in software processes.

Keywords: Green IS, Sustainability, Software management, Environment, Decision making

1. Introduction

The limitation of integrating Green information systems into software management to create a sustainable decision making in software process is a current issue. The memo of sustainable development was placed on the global agenda in 1987 and has still not been systematically addressed by software and corporate sector. Despite growing concern over climate change and other sustainability issues (Chris et al., 2014). Sustainability or Eco-Sustainable development implies a long term vision, which does not compromise the ability of future generations to meet their needs. Green Information System is a current recognized domain in Information Systems research which has been the topic of academicians, researchers and practitioners since 2007. However, researchers in this field have addressed the issues related to environmental sustainability and the application of IS in software processes (Esfahani et al., 2015c).

According to Helen et al. (2012) information systems discipline can have a central role in creating an ecologically sustainable society because of the field"s five decades of experience in building, designing, deploying, evaluating, managing and studying IS to resolve complex problems. Therefore, there has been major concern regarding environmental sustainability issues. Besides, software industries are under pressure from government, environmental organisation and shareholders to improve their environmental sustainability activities. Green Information Systems in software process is aimed at mitigating software development"s impact on the natural environment, in which these strategies can include changes to software practitioner"s, processes, products and governance structure such as reducing energy consumption and waste generation, using organic sustainable resources, and implementing an ecological management system (Esfahani et al., 2015b).

Thus, Green Information Systems (IS) is associated with social, economic and environmental aspect of software process and has much to contribute to sustainable outcomes in the face of climate change and other environmental challenges. Information and Communications Technologies (ICT) can be seen as major polluters through the energy used over the life cycle of software development process, ICT devices and through e-waste (Bokolo and Mazlina, 2016). However, this negative aspect can be balanced against the enormous potential of information systems to contribute innovative solutions to both the mitigation of, and adaptation and resilience to climate change and other environmental problems. E.g. strategic use of information system in smart motor systems, logistics, buildings, and grids is valued to decrease approximately 7.8 billion tonnes (Gt) carbon dioxide equivalent (CO_2e), which can translate into approximately