

An Agent Based Green Assessment System Architecture for Sustainable Practice Implementation among IT Practitioners in University Campuses

Bokolo Anthony Jnr.

Faculty of Computer Systems and Software Engineering
Universiti Malaysia Pahang (UMP)
Lebuhraya Tun Razak, 26300 Gambang, Pahang, Malaysia
bkanjr@gmail.com

Mazlina Abdul Majid

Faculty of Computer Systems and Software Engineering
Universiti Malaysia Pahang (UMP)
Lebuhraya Tun Razak, 26300 Gambang, Pahang, Malaysia
mazlina@ump.edu.my

Awanis Romli

Faculty of Computer Systems and Software Engineering
Universiti Malaysia Pahang (UMP)
Lebuhraya Tun Razak, 26300 Gambang, Pahang, Malaysia
awanis@ump.edu.my

Abstract—Sustainability has progressively become significant to research and practice in educational sector over the year as a result of rapid reduction of natural resources and sudden climatic changes. The fast changing global weather requires Information Technology (IT) practitioners in university institutions to respond to these changes and implement Green strategies and initiatives. However the literature on implementing Green practices by university campuses is still in its infancy, an emphasis on sustainability has been argued to support IT practitioners enhance the use of IT infrastructures, while achieving a sustained university campus. While sustainability has gained increasing attention from researchers and academicians in organizations and industries, sustainability practice implementation in university sector is still not fully successful since IT practitioners currently uses manual based Green assessment methods. IT practitioners in university campuses lack the capability to assess their current Green practices automatically. Therefore there is need for architecture to support IT practitioners in assessing, benchmarking and rating their current Green practice implementation to ascertain if the sustainability goal of economic, people and environment is archived or if they need to improve their Green process implementation. To overcome the aforementioned problems this research proposes an agent based Green assessment architecture to evaluate the current practice implementation in university campuses automatically. The proposed Green assessment system architecture also provides Green process implementation suggestions to IT practitioners.

Keywords—Sustainability; Green Practice; Assessment; Software Agents; System Architecture

I. INTRODUCTION

Presently energy use and its related cost has been the main determinants for Green practice implementation, a raising concern of the risks of climate change and raising debates about energy consumption have elevated Green practice implementation in institutions to a global issue. Sustainability issues in university institutions involving Information Technology (IT) infrastructure usage, optimization and changes in procedures involved in disposing of electronic waste (e-wastes) pollution, usage of natural resources such as water, air and trees which is cut down for papers and used for printing in universities [1]. Green initiatives and strategies in university campuses is the practice of maximizing the effective use of computing resources to decrease environmental effects. It also includes the goals of monitoring and reducing IT infrastructure environmental footprint by diminishing the use of harmful materials, water, energy and other limited resources, as well as decreasing waste from old IT hardware and throughout the university campus. Green initiatives and strategies extend to IT infrastructure use over its process lifecycle, and the reuse, recycling, refurbishing of obsolete computer generated hardware.

Sustainable goal attainment in university refers to the impact of IT service and facilities utilization in campuses to include environmental, social and economic responsibility