

IMPROVING GREEN IT ASSESSMENT
TOOL USING CASE-BASED REASONING
TECHNIQUE

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I/We* hereby declare that I/We* have checked this thesis/project* and in my/our* opinion, this thesis/project* is adequate in terms of scope and quality for the award of the degree of in Bachelor Degree in Computer Science (Computer System & Networking)

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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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Thesis submitted in fulfillment of the requirements
for the award of the degree of
Bachelor of Computer Science (Computer Systems and Networking)

Faculty of Computer Systems & Software Engineering
UNIVERSITI MALAYSIA PAHANG

MAY 2019

ACKNOWLEDGEMENTS

I would like to take this opportunity to express my gratitude towards my supervisor, Dr Mazlina Abdul Majid who gave me guidance throughout this whole research project. It is a great honour to be able to do this research under her supervision. She has provided me with lots of insight and advices throughout this whole project.

An incomparable appreciation towards my family and friends for supporting me and encouraging me throughout this whole research. Their motivation played a big role in keeping me going and completing this thesis in time.

ABSTRAK

Dalam era pemodenan ini, di mana trend sekarang kebanyakan adalah teknologi. Ia adalah penting untuk mengambil perhatian terhadap alam persekitaran kami, seperti kata pepatah Bahasa Inggeris setiap tindakan mempunyai reaksi. Walaupun teknologi boleh membawa banyak faedah kepada kita tetapi jika ia tidak digunakan dengan baik, ia boleh membawa bahaya kepada alam sekitar. Contoh seperti pelepasan jejak karbon. Oleh sebab itu, munculnya amalan hijau. Amalan hijau adalah usaha atau langkah untuk membantu mengurangkan isu-isu alam sekitar dan berusaha untuk mencapai matlamat kemampanan UN. Untuk mengetahui atau mengukur tahap amalan hijau, alat penilaian hijau telah diwujudkan sebagai panduan atau juga boleh dikenali sebagai penanda bangku. Walaupun wujudnya alat penilaian hijau, tetapi alat penilaian hijau dengan ciri cadangan tidak mencukupi. Ciri cadangan adalah bertujuan untuk membantu pengguna terutama pengguna baru dengan amalan hijau mereka. Dalam tesis ini, *case-based reasoning* akan menjadi kaedah yang digunakan untuk menghasilkan ciri cadangan ini. Selain itu, tesis ini akan menggunakan model *Rapid Application Development*. Hasil yang diharapkan dari tesis ini adalah untuk memperbaiki alat penilaian hijau yang sedia ada untuk memberikan saranan kepada pengguna. Dengan projek penyelidikan tesis ini, ia dapat membantu meningkatkan kesedaran masyarakat dan memperbaiki amalan hijau mereka.

ABSTRACT

In this era of modernization, where technologies are the trend, it is important to take not of our surrounding too. As the saying goes, every action has a reaction. Despite the fact that technologies can bring us many benefits, but if is not well utilize, it can cause harms to the environment. Example such as efforts or move to help to reduce environment issues and to works towards UN sustainability goals. In order to know or measure their level of green practices, green assessment tool is there to act as a guide or as some might called it as a bench marker. Although, there are existing green assessment tools but there is inadequate existing green assessment tool with a recommendation feature. Recommendation feature is meant to aid users especially new user with their green practices. In this thesis, case-based reasoning will be the method used to produce this recommendation features. Besides that, this thesis will be applying Rapid Application Development Model. The expected result of this thesis is to improve an existing green assessment tool to provide recommendation to user. With this thesis research project, it can help to raise user's level of green awareness and improve their practices.

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LIST OF ABBREVIATIONS

IS	Information System
IT	Information Technology
ICT	Information & Communications Technology
GiTaT	Green IT Assessment Tool
IP	Internet Protocol
CBR	Case-Based Reasoning

CHAPTER 1

INTRODUCTION

1.1 Introduction

Chapter 1 introduces the research by first outlining a discussion on the background and motivation for pursuing the study. After that, it is followed by an overview to provide an initial understanding of the research undertaken. A description on how this thesis is used to conclude the chapter.

1.2 Background and Motivation

In this era of modernization, growth of the country and people are placed as the focus of every single country in the world. With that goal in mind, our Mother Earth are facing repercussion of our actions such as global warming, climate changes, thinning of ozone layer, depletion of resources and lot more. All these are environmental issues that have been emerging for the past decades as people evolved to be a more civilised country.

This is where sustainability comes in. sustainability is the process of maintaining change in a balanced fashion, in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspirations. ("What is sustainability," n.d.). In simpler terms, is to make sure the balance between advancement of mankind and at the same time minimize our negative impact on the environment. Sustainable development goals have been identified by the 2005 World Summit on Social Development(60/1. *2005 World Summit Outcome*, 2005). It consists of 3 pillars that interdependent on each other which are economy, society and environment(Morelli, 2011) as shown in the figure below Figure 1.1. These three pillars in the recent years has served as a benchmark for numerous sustainability standards and certification

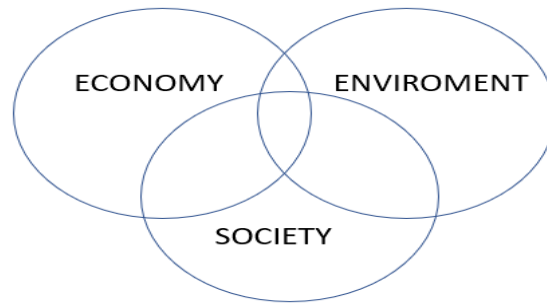


Figure 1.1: The three pillars are interdependent on each other.

In an effort to reduce the impact of advancement on the environment, green concept is popularized. Examples of the green concept that is introduced are such as green building, green computing, green information system (green IS), green technologies and others more. Green computing is maintaining or increase the performance of the computer while minimizing the computer resources usage proficiently. The goals of green computing are such as reduce the use of hazardous materials, maximize energy efficiency during the product's lifetime, and the recyclability of products. Approaches has been made to aid in green computing among them are product longevity, data centre design, software and deployment optimization and others more. These are the endeavours to reduce environmental issues caused by IT daily operations.

As the days passes by the usage of ICT equipment such as computer is increasing, as it makes daily operations smoother and faster. Although approaches been made, sadly, not many people are aware of green computing to help to reduce the negative impact of ICT on the environment. As ICT is always evolving, it cannot be helped that many people are not aware the side effect as they focus on the bigger picture, ICT itself.

Despite that, tools to measure green computing/ICT is already in existence. And Green IT Assessment Tool, GiTaT is one of the latest tools that exist not only to be used as a benchmark to measure green in green computing/ICT, but it can also suggest the best practices to its user. GiTaT is easily accessible as it is a web-based tools. It was to build to be a smart and user-friendly tool by performing evaluation, and able to give rating, reports of the user level of green and able to give user the best practice suggestions.

GiTaT measures current Green IT/IS practices implemented in organizations with regards to environment, people and profit. Besides, as a web-based platform, it promotes sustainability by organizations towards evaluating, benchmarking and rating their current Green IT/IS practices. GiTaT offers inexpensive and practical guidelines to implementing Green IT/IS. Another thing about GiTaT is that it replaces the manual paper self-assessment methods based on checklists previously used in organizations. Electronic certification on Green IT/IS assessment taken is generated autonomously. Decision making recommendations is provided for organizations in implementing Green IT/IS best practices towards achieving sustainability.

Therefore, this project research proposes on the theory and practice on developing a more friendly-user Green Assessment Tools using cased-based reasoning. The idea of this research is to help user that is new to green computing and help user to improve their green computing knowledge.

1.3 Problem Statement

There are two problem which are determine that leads to this research project. In order to contribute to green computing, the problem that were determine are the level of awareness of public towards green computing are low and so is the level of their practices of green computing in their daily life.

As mention above, the lack of awareness of green computing existence itself is one of the main reasons as to the lack of implementation of green computing. In order to create awareness of green computing to ICT consumer, an assessment tool can be used to measure to indicate the ICT consumer awareness of green computing. There are many existing green assessment tools such as Green ICT Assessment Tool, Self-Green ICT Maturity Assessment Tool and Green IT Assessment Tool (GiTaT). Based on these three existing green assessment tools, none of these existing green assessment tool existing information can keep up with the green trend. It is known that as the passage of time, new green practices will exist just as technology changes rapidly with time. In order to sustain all the new incoming information of green practices, it will be an improvement if there is a green assessment tool that can keep up with the newest and latest green trend information. Based on that reason, this research-based project will be focusing on improving Green IT Assessment Tool (GiTaT) to develop suggestion and filter search

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