GREEN IT PRACTICE: MODEL FOR ORGANISATIONAL SUSTAINABILITY IN MALAYSIA

BY

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ABSTRACT

Organisational sustainability are viewed from the economic, social, and environmental perspectives. Focusing on organisational sustainability has allowed organisations to accomplish their goal. Green IT practice plays an important role in organisational management. However, at present, Green IT practice and its influence remain equivocal in the field of ICT and sustainability. Regardless, there are voluminous research efforts on the topic in an attempt to minimise compromising the well-being of future generations. In Malaysia, Green IT has been introduced since 2009. Nevertheless, Green IT acceptance among Malaysians is progressing rather slowly and this is alarming. Even though empirical discussions related to Green IT practice are abundant as it is studied around the globe, only limited number of studies have been conducted to investigate the current practice and they hardly focus upon Malaysia specifically. In the absence of previous research on Green IT in Malaysia, the direction and orientation of this study has been significantly influenced by four decades of Green IT research in Western nations. Thus, this study was carried out to identify Green IT practice in organisations in Malaysia and to examine the influence of Green IT practice on organisational sustainability. A new model on Green IT practice for organisational sustainability was proposed. In formulating this model, a sequential exploratory research design was used to explore the influences between variables. The data collection was carried out for a period of two months. In the exploratary study phase, interviews with ten IT executives were conducted to identify Green IT practices in the organisations. 35 Green IT practices were identified in the sample organisations. Meanwhile, on quantitative phase involved the administration of a questionnaire that measured the respondents' demographic, Green IT knowledge, Green IT belief, institutional pressure, Green IT practice and organisational sustainability. Simple random sampling was used and 323 usable data were gathered from IT executives. Data were analysed using SPSS Statistics version 23.0 and Analysis of Moment Structures - Structural Equation Modelling (AMOS-SEM). The result showed direct influence between Green IT practice and organisational sustainability. On the contrary, insignificant results were found in the influence between Green IT knowledge with Green IT practice, and Green IT belief with Green IT practice. The findings of this study revealed the current implementation of Green IT in Malaysia. From a practical viewpoint, this study will be useful for related government agency to measure the level of Green IT practice in Malaysia. Moreover, it will assist organisations in their strategic planning to fully maximise the advantage of Green IT practice.

خلاصة البحث

للإستدامة المؤسسية أبعاد اقتصادية واجتماعية وبيئية هامة، نظراً لما تلعبه من دور في مساعدة المنشآت المؤسسية المتعددة على بلوغ أهدافها وغاياتها المنشودة. وعلى الرغم من أهمية الدور الذي تلعبه ممارسة تكنولوجيا المعلومات الخضراء (الصديقة للبيئة) في الإستدامة المؤسسية، لم يتم تسليط الضوء الكافي على هذا النوع من تكنولوجيا المعلومات، ولا على أثرها العميق في مجال الحاسوب وتقنياته المختلفة حتى وقتنا الحالي. وقد ظهرت العديد من المجهودات البحثية المطولة حول هذا الموضوع، وهي جهود جاءت كمحاولة لخلق مستقبل أفضل للأجيال القادمة . وهنا في ماليزيا، تم طرح فكرة التكنولوجيا الخضراء منذ عام2009، إلا أن تقبل هذا النوع من التكنولوجيا - من قبل الماليزيين - يسيير بشئ من البطئ، وهو ما قد يثير قلق بعض المهتمين بهذا الموضوع .وعلى الرغم من وجود العديد من الدراسات التجريبية التي تناولت موضوع ممارسة تكنولوجيا المعلومات الخضراء بالبحث و التدقيق، إلا أن القليل منها فقط تطرق إلى دراسة تطبيق تكنولوجيا المعلومات الخضراء الحالية التي يتم استخدامها ، ولم تتطرق أي من هذه الدراسات على الإطلاق، لدراسة واقع تطبيق واستخدام هذه الممارسات في الواقع الماليزي. وفي هذا الإطار، ونظرا لعدم وجود أي دراسات سابقة ترصد أو تفنذ واقع ممارسة تكنولوجيا المعلومات الخضراء في ماليزيا، فلقد تأثرت هذه الدراسة بالطبع، قلبا وقالبا، بأربع عقود كاملة من التاريخ البحثي في مجال ممارسة تكنولوجيا المعلومات الخضراء في الدول الغربية .ولقد بنيت هذه الدراسة على أساس تحديد وتعريف مفهوم ممارسة تكنولوجيا المعلومات الخضراء داخل المؤسسات الماليزية من ناحية، ودراسة مدي تأثيرها على الإستدامة المؤسسية من ناحية أخرى . وقد قام الباحث باستخدام أسلوب بحثي استكشافي متسلسل في للبحث في العلاقة بين المتغيرات المختلفة. وقد تم جمع المعلومات الخاصة بهذا البحث على مدار شهرين كاملين. في المرحلة الأولى تم إجراء مقابلات شخصية مع عشرة من مستخدمي تكنولوجيا المعلومات الخضراء، بهدف تعديد أبعاد ممارسة تكنولوجيا المعلومات الخضراء داخل المؤسسات. وفي هذا الإطار، قامت الدراسة برصد خمسة و ثلاثين نوع من هذه الممارسات أو تطبيقات استخدام هذا النوع من التكنولوجيا . وفي المرحلة الثانية، تم تقديم إستجواب لموظفي الإدارة لقياس معلوماتهم السكانية ومدي درايتهم و معرفتهم بتكنولوجيا المعلومات الخضراء ومفاهيمها، وبالإضافة إلى قياس الضغط المؤسسي، وحجم استخدام تكنولوجيا المعلومات الخضراء في الإستدامة المؤسسية . وتم عرض عينة عشوائية بسيطة و تجميع عدد 323 من البيانات القابلة للإستخدام من قبل مستخدمي تكنولوجيا المعلومات. وقد تم تعليل البيانات باستخدام البرامجة التالية:
برنامج (AMOS-SEM) Analysis of Moment Structures - Structural Modellingوبرنامج SPSS Statistics version 23.0 وقد أشارت النتائج إلى وجود علاقة مباشرة بين استخدام ممارسة تطبيق تكنولوجيا المعلومات الخضراء من ناحية والإستدامة المؤسسية من ناحية أخرى. و على العكس من هذا لم ترصد الدراسة وجود أي علاقة تذكر بين وجود خلفية مسبقة بتكنولوجيا المعلومات الخضراء من ناحية وآليات تطبيقها من ناحية أخرى، ولا بين وجود قناعة بأهمية تكنولوجيا المعلومات الخضراء من ناحية و تطبيقها من ناحية أخرى. وقد عكست الدراسة واقع تطبيق تكنولوجيا المعلومات الخضراء في ماليزيا. ومن الناحية التطبيقية، فإن هذه الدراسة تكون ذات نفع كبير للوكالات الحكومية المعنية بقياس مستوي ومقدار تطبيق تكنولوجيا المعلومات الخضراء في ماليزيا، هذا بالطبع بالإضافة إلى الدور المساعد الذي ستلعبه في مساعدة المنظمات المختلفة في وضع خطط استراتيجية لتعميق الإستفادة من مميزات استخدام تكنولوجيا المعلومات الخضراء.

APPROVAL PAGE

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DECLARATION

I hereby declare that this thesis is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Sri Fatiany Abdul Kader Jailani

Signature …… Date ……..

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This thesis is dedicated to my parents, husband, best friends and children for their love and support throughout many stages of this colorful journey.

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CHAPTER ONE

INTRODUCTION

1.1 OVERVIEW

Green IT practice plays an important role in organisational management. This practice assists the organisations to achieve its goal of sustainability by focusing on three perspectives; namely economic, social, and environmental (Triple Bottom Line index) (Slingerland & Stork, 2000). Given the relative absence of previous research on Green IT in Malaysia, the direction and orientation of this study are significantly influenced by four decades of Green IT research in Western countries.

This chapter outlines the journey of this study. It starts with the background of the study, and then continues with an overview of the implementation of Green IT in Malaysia. Next, it continues with the objective according to the problem statement of this study; what the study needs to achieve. Lastly, it outlines the contribution of this research.

1.2 BACKGROUND OF THE STUDY

Green Information Technology (IT) has become the latest buzzword in IT management, although a common understanding of the coverage and scope is still missing in research and practice (Velte, Velte, & Elsenpeter, 2008). The implementation of Green IT is a multifaceted construct that is intended to address both IT and non-IT related sustainability problems (Elliot & Binney, 2008). Moreover, the terms ‘Green’, ‘eco-efficiency’ and ‘sustainability’ are widely used among researchers in the field (Molla, 2009a). The importance of Green IT has been strongly suggested

through practitioner reports (Knox & Lull, 2009; Gartner, 2008; Info-Tech, 2007a, 2007b) and emerging academic articles (Chen et al., 2008; Elliot, 2007; Elliot & Binney, 2008). However, the capabilities that businesses and other organisations need to build in order to apply Green IT and the extent to which they have progressed along the path have not been reported in the literature (Molla, Pittayachawan, & Corbitt, 2009).

Investing in Green IT will lead to new economic system; supplying and servicing energy efficient equipment and developing green technology are just some of the ways in which companies can increase revenue and fuel job growth in a low-carbon economy (Berry, 2017). Studies have found that firms have invested interest in Green innovation because "going Green" helps businesses develop new market opportunities and increase their competitive advantage (Chen et al, 2008; Rennings & Rammer, 2009). Successfully implementing Green innovation helps firms to achieve greater efficiency, strengthens their core competencies, enhances their Green image and as a result may contribute to increase profitability (Chen et al., 2008). Furthermore, Murugesan and Gangadharan (2012), agreed that Green IT may require reengineering of business processes and practices, which in some instances, could be a major challenge in which companies have to address holistically. One of the challenges is the need to implement cost saving initiative in the companies. By reducing spending on equipment and energy, paper and ink, and receiving tax breaks and other financial incentives, Green IT has become a practical way for organisations to save their money. Organisations that demonstrate initiatives in this area are those that are responsive to investors and customers (Berry, 2017).

1.3 GREEN IT in MALAYSIA

The Malaysian Government under the Ministry of Energy, Green Technology and Water (MEGTW) is promoting Green technology as a main driver to accelerate the national economy and promote sustainable development. In conjunction with that, a National Green Technology Policy (NGTP) was launched in order to demonstrate that Malaysia is serious in the implementation of Green IT with an objective to intensify Green technology research and innovation towards commercialisation, promotion, and public awareness of Green technology. According to Zairah, Rahim, and Samuri (2018), there is a drastic growth of IT users in Malaysia. During 2015, 71.1% of Malaysians were internet users an increase of 57% from 2013. The percentage of computer users also increased from 56% in 2013 to 68.70% in 2015. With the fast evolution of IT industry, the numbers are expected to increase rapidly in the near future (Department of Statistics Malaysia, 2016). The increasing number of IT users in Malaysia is parallel with the increase in carbon dioxide (CO2) emissions contributed by IT usage that in turn adversely affecting the environment. According to Gartner (2008), IT devices contribute at least 2% of CO2 emission which is equal to the CO2 emission in the aviation industry. As a consequence, the Malaysian government had promised to give a full commitment to reduce the level of CO2 emissions by 40% in 2020. The statement was issued by the then Prime Minister of Malaysia, Dato' Seri Najib Bin Tun Razak in Copenhagen, Denmark in 2009.

In addition, Green technology has been the limelight of the Malaysian Public Sector ICT Strategic Plan of 2010 to 2015 (Zainal, 2010). Four pillars, namely energy, social, environmental and economic, as shown in Figure 1.1, which were adopted from Lockwood (2006), have been constituted as elements of national Green technology policy .

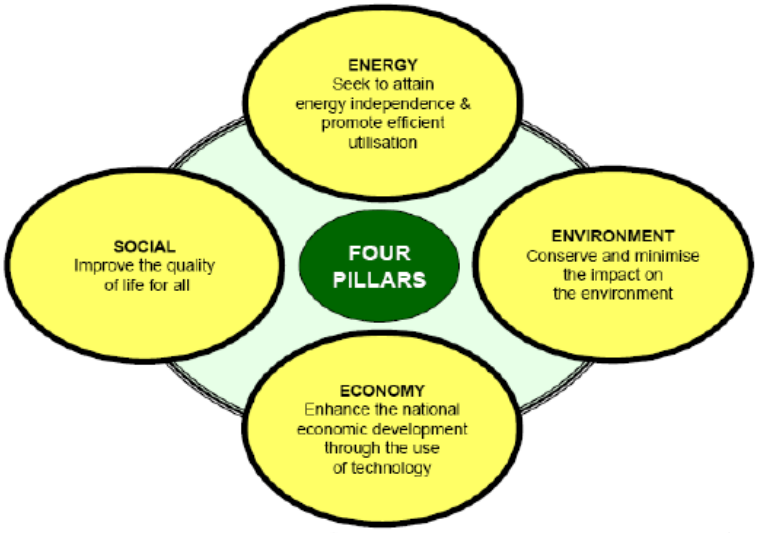

Figure 1.1: The National Green Technology Policy (Lockwood, 2006)

More recently, the 11th Malaysia Plan (2016 – 2020) outlines six strategic thrusts aimed to address the needs of the nation in staying ahead of global challenges and opportunities. One of these thrusts is "Pursuing Green growth for sustainability and resilience", demonstrating Malaysia's commitment to pursue development in a more sustainable manner. This research is timely because it addresses the issue that is relevant with the current focus and priority of the nation.

Green IT in Malaysia has been introduced since 2009. However, Green IT acceptance among Malaysians is still slowly progressing and this is an alarming condition. The emission of Carbon Dioxide (CO_2) in Malaysia is increasing at a worrying rate and as a result, the government aims to reduce 40% of the CO_2 emission by 2020 through the implementation of Green IT. According to Samuri (2014), the level of Green IT awareness among Malaysians is still literally non-existent. This was agreed by Raj (2008), who stated that although the concept of Green IT had been introduced to Malaysians, its practice among the public's is still not aligned to the Green IT initiatives. The outcomes of Green IT initiatives are questionable and may

not reach the people at large. Meanwhile, Din, Haron, and Ahmad (2013), reported that the level of awareness on Green ICT is average in Malaysia.

According to Md Salleh (2010), some of the Green IT practices that have been implemented in Malaysia's MEGTW and may be necessary for other organisations include configuring computers into sleep mode when it is not in use, insuring all equipment are turned off before exiting the position, and also printing or making copies only when it is actually required. The limited literature on Green IT practices in Malaysia demonstrates that although the concept of Green IT has been introduced by the relevant authorities, supervision on the implementation is still needed. Samuri (2014), proposed a number of strategies and research that should be carried out in order to get the full advantage of Green IT practices. First of all, it is crucial to create awareness regarding the benefits of Green IT practices. Awareness is the first stage that should be undertaken to ensure the successful implementation of Green IT practices. A high level of awareness is needed to make the environment greener in a developed nation. For instance, a study on the development of a prototype system to monitor the ecological and sustainability behaviour in Malaysia's public sector conducted by Razali, Loindin, Leau, and Hanapi (2012), revealed that the level of awareness on Green IT among the users in Malaysia's government sector is poor as many of them do not appreciate the significance of Green IT practice. Besides the federal government, the local government also proposed to implement Green IT practice at its level because it aims to achieve sustainability in reducing the negative impact of IT infrastructure (Abdul Majid & Romli, 2019). Although the Malaysian Administrative, Modernisation and Management Planning Unit (MAMPU) has released Green IT guidelines, some organisations are still unaware of this matter