The Drivers, Practices and Outcomes of Green Supply Chain Management: Insights from ISO14001 Manufacturing Firms in Malaysia

K.S. Savita, Computer and Information Sciences Department, Universiti Teknologi PETRONAS, Perak, Malaysia
P.D.D. Dominic, Computer and Information Sciences Department, Universiti Teknologi PETRONAS, Perak, Malaysia
T. Ramayah, School of Management, Universiti Sains Malaysia, Penang, Malaysia & UTM International Business School (UTM-IBS), Universiti Teknologi Malaysia, Kuala Lumpur, Malaysia

ABSTRACT

The global shift in ecological movement has significant impacts on business operation of manufacturing firms that are located in developing countries. The intense pressure of being environmentally sustainable has caused Green Supply Chain Management (Green SCM) concept to emerge as an important corporate environmental strategy for manufacturing companies. Information technologies and systems have permeated in most business activities, in which, they extend important opportunities to resolve environmental issues. However, many researchers, including manufacturers and government bodies often disregard the green concept of information technologies and systems in minimizing environmental issues. A comprehensive review on Green SCM, Green IT and Green IS for sustainable environmental performance in manufacturing companies is presented using Input-Process-Output (IPO) Theory and Technological-Organizational-Environmental (TOE) theory. In bridging the research gap, a model is constructed to link the aforementioned constructs. Next, the paper reports on the development of survey questionnaire using cognitive interviewing strategies, followed up with semi-structured interview to investigate and obtain preliminary findings on the influential factors, green activities and performance outcomes from implementing Green SCM. Lastly, the finalized survey questionnaire was distributed to 60 ISO14001 certified manufacturing companies located in the region of Perak and Kulim. Out of 60 manufacturing companies, only 32 responses received as the dataset in analyzing for improvements in reliability, measurement error, and validity of measured items. The findings from this pilot study explain that internal and external factors have stronger influence over the implementation of green initiatives in supply chain with substantial outcome on environmental performance. The information technologies and systems being the physical resource, capability and backbone to run a business seamlessly are significantly recognized. But, the green component of IT and IS were poorly attended and disregarded to an extent in the process of greening the processes, operations or entire business. Therefore, further investigations are required in the main study to validate the findings obtained here and other possible association between the factors, practices and outcomes in realizing ecological improvements in the supply chain and firm itself.

KEYWORDS

Green IS, Green IT, Green Supply Chain Management (GSCM), Malaysia, Motivating Factors, Performance Outcomes, Practices, Pre-Test, Sustainability, TOE

DOI: 10.4018/IJISSCM.2016040103

Copyright © 2016, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.
INTRODUCTION

Manufacturing sector plays a key role in the modernization of a country, and is capable to extensively differentiate the developed countries from the developing ones (El-Khasawneh, 2012). The developing countries are the main contributors of increasing environmental issues, in which have negatively affecting the ecological sustainability as compared to the developed countries (Markandya & Halsnaes, 2004; Mithas, Jiban, & Roy, 2010). The increased levels of production of CO2 and Greenhouse Gas (GHG) emissions are significantly causes adverse change to the global climate. This phenomena is in responds to the intensified growth of economic and urban populations of a nation (Gholami, Sulaiman, Ramayah, & Molla, 2013).

Being a nation that has emerged in a multi-sector economy, Malaysia offers a cost-competitive location for investors to capitalize in manufacturing advanced technological products for both national and international markets. Hence, manufacturing sector still remains as a significant contributor to the growth of Malaysia’s economy (MIDA, 2012). Furthermore, Malaysia is making marginal, yet positive progression towards environmental management for the past few years (MGCC, 2012). Despite that, Malaysia is facing ecological challenges in terms of increased usage of energy (electricity), inadequate management of household and industrial wastes as well as poor treated gases emitted to the air (Abidin & Jelani, 2011; MGCC, 2012).

Industrialization, urbanization and boundless transactions are stimulating the production and widespread use of computers, printers, office equipment, servers, air conditioning devices and related IT infrastructures. These machines, hardware and infrastructures are consuming substantial amounts of energy to produce and operate (San Murugesan, 2008). Furthermore, ill-treated and irresponsible acts of manufacturing, managing and disposing of those tools are detrimental to the quality of air, water and soil that severely influence the environmental degradation (San Murugesan, 2008). In addition, the increase in information technologies and systems usage along with continuous high edge innovation has caused the shortening of IT product’s life span, while mounting on the amount of e-waste being disposed. This scenario is obvious in developing countries like Malaysia, whereby the large scale adoption of PC, facilities equipment and proliferation of data centers are growing steadily in contributing to carbon emission, energy consumption and e-waste production.

The term green, eco-sustainable and environmental friendly are often used interchangeably. This concept describe an entity as a company, its products or production processes that consume less energy, minimize use of harmful materials, use of recycled materials, reduce of waste produce, minimize emission and pollution, as well as preserving natural resources (Molla, Cooper, & Pittayachawan, 2011). Both the Environmental Management (EM) and Supply Chain Management (SCM) have their own root that complement each other and must not be disregarded (Zhu, Sarkis, & Lai, 2008b). The implementation of Information Technology (IT) and Information System (IS) in SCM is becoming apparently important in a progressively globalized and competitive economy. The development of IT and IS in supply chain has rapidly changed the ways business are carry out seamlessly around the world. The uses of IT and IS are considered as prerequisite for an effective control of today’s complex supply chain (Fasanghari, Roudsari, & Chaharsooghi, 2008). This highlighted that IT is a spring of essential resources for competitive necessity in achieving an edge in business (Li, Yang, Sun, & Sohal, 2009).

Although broader literature suggests that other internal and external factors have much stronger influence on the organization’s behavior towards sustainability, yet the roles of Information Technologies and Systems (IT&S) are often ignored by organizations in the assessment of their environmental footprints (Jenkin, Webster, & McShane, 2011). The design, development and implementation of IT&S represent the backbone of ecological friendly efforts that support a firm’s environmental management systems (Cai, Chen, & Bose, 2013).

The positive and negative impacts that IT&S might have on the organizations’ environmental and sustainable movement still remain unexplored. Therefore, an in-depth research is required to
Equipment Replacement Decisions Models with the Context of Flexible Manufacturing Cells
Ioan Constantin Dima, Janusz Grabara and Mária Nowicka-Skowron (2012).
*Operations Management Research and Cellular Manufacturing Systems: Innovative Methods and Approaches* (pp. 401-411).
[www.igi-global.com/chapter/equipment-replacement-decisions-models-context/60008?camid=4v1a](www.igi-global.com/chapter/equipment-replacement-decisions-models-context/60008?camid=4v1a)

Methodology for Environmental Sustainability Evaluation Of Airport Development Alternatives
[www.igi-global.com/article/methodology-for-environmental-sustainability-evaluation-of-airport-development-alternatives/108516?camid=4v1a](www.igi-global.com/article/methodology-for-environmental-sustainability-evaluation-of-airport-development-alternatives/108516?camid=4v1a)