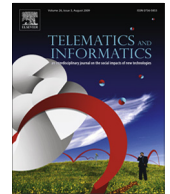




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Modelling upper echelons' behavioural drivers of Green IT/IS adoption using an integrated Interpretive Structural Modelling – Analytic Network Process approach



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ABSTRACT

The purpose of this paper is to understand and identify various psychological drivers which motivate managers of organizations to adopt Green information technology (Green IT) and Green information system (Green IS) within their corporations. These psychological factors are modelled through the lens of Upper Echelon Theory (UET) to study their interrelationship and interdependency and further prioritize them to strategize appropriate managerial actions. The factors were identified through an exhaustive literature review and further confirmed by the experts in the field. A hybrid Interpretive Structural Modelling – Analytic Network Process (ISM-ANP) approach has been adopted to establish the complex interrelationship among the psychological drivers and further to cluster and prioritize them. The main contribution of this study is composing directions and dominance of various psychological drivers to enhance decision-making process of managers towards the adoption of Green IT/IS. As long as decisions are made by individuals within organizations, this paper forms the basis of identifying individual-level factors important in motivating managers towards Green IT/IS adoption. The results of this study would help organizations and policy makers to understand and develop strategies to target and select an individual for managerial position with mind-set more towards environmental sustainability and Green IT/IS concepts. By applying the proposed methodology, organizations can classify and prioritize their action plans such as several educational methods to reinforce, foster and incline psychological factors to motivate their individuals to behave proenvironmentally and practice Green IT/IS initiatives to enhance environmental sustainability of their corporations.

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1. Introduction

Given the global imperative for environmental sustainability (ES), Green IT and IS are important and pertinent research topics in IS discipline (Khor et al., 2015). The integration of environmental concern into IT and utilizing IT to enhance ES encouraged organizations to develop and adopt Green IT/IS related initiatives (Dalvi Esfahani et al., 2015; Esfahani et al., 2015a,b).

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In this research we distinguish between IT and IS clearly while in some studies these terms are used interchangeably. Accordingly, IT is referred to technology itself which is responsible for processing, storing, and networking. While, IS is “a combination of people, processes, and technologies that enables the processing of digitized information” (Melville, 2010). Boudreau et al. (2008) defined IS as “an integrated and cooperating set of software using information technologies to support individual, group, organizational, or societal goals”. Hence, it can be concluded that IT “comprises the technological foundation of information systems” (Melville, 2010). While IT and IS are considered distinct, their contributions to the environmental issues are considered different as well (Chen et al., 2011). In other words, while IT is considered as part of the problem (e.g., energy consumption), IS contributes to the environment positively and is considered as part of the solution (e.g., telepresence systems) (Boudreau et al., 2008; Watson et al., 2010).

While studies on drivers of organizational Green IT/IS adoption are steeped in IS literature (Ainin et al., 2015; Angeles and Fredericton, 2015; Deng and Ji, 2015; Molla et al., 2014; Opitz et al., 2014), there appears to be discrepancy between the advantages, and the de facto diffusion of Green IT/IS. The adoption and implementation of organizational green initiatives is not solely driven by commercial imperatives (Hemingway and Maclagan, 2004), but it could be associated with the environmental beliefs and attitudes of managers as well (Esfahani et al., 2015a). Knowledge regarding the environmental beliefs of managers and their actions towards environmental sustainability, together with the factors which contribute to their beliefs and action formation would be utilized to define the strategies to encourage individuals and groups to engage more in greener behaviours, and to facilitate the implementation of organizational Green IT/IS initiatives and strategies (Molla et al., 2014).

The main theoretical perspective of this research is based on the Upper Echelon Theory (UET) (Hambrick and Mason, 1984) which is deeply rooted in the behavioural theory of the firm. Based on this theory, while upper echelons (e.g., top management team) are the most important and powerful actors within an organization, values, psychological characteristics and demographic compositions of its leaders are accounted for to understand better the organizational outcomes (Evans and Butler, 2011). The purpose of this paper is to identify the prominent psychological drivers of managers’ proenvironmental behaviour to adopt Green IT/IS through the lens of UET by answering the following research questions:

- What are the main psychological drivers of Green IT/IS diffusion?
- How is the contextual interrelationship among these barriers?
- How is the priority level of each identified driver?

To answer these questions, we derived the main drivers through an extensive literature review and further analysed based on experts’ opinions utilizing the Interpretive Structural Modelling (ISM) approach and *Matrice d’Impacts Croisés-Multiplication Appliquée à un Classement* (MICMAC) analysis technique. Furthermore, Analytical Network Process (ANP) method is applied to prioritize the identified drivers based on their importance that can be used by organizations to identify new schemes and action plans.

The organization of the paper is as follows. The theoretical background of the study is presented in Section 2. Identification of the psychological drivers of Green IT/IS adoption has been done in Section 3 by exploring the relevant literature. The ISM-ANP methodology to find the levels of these barriers has been presented in Section 4. The ISM-based model together with levels’ partitioning of identified factors are presented in Section 5. Ranking the factors utilizing ANP tool is discussed in Section 6. Section 7 discusses the results of the study together with managerial implications. Conclusions of the study and its limitations are presented in Section 8.

2. Theoretical background

We believe that investigating the psychological drivers of Green IT/IS adoption from the lens of UET yields a finely grained understanding of managers’ proenvironmental behaviour towards practicing of Green IT/IS initiative within their corporations.

2.1. Upper Echelon Theory

The starting point of understanding the UET is the notion by March and Simon (1958) who says the managers bring their own values and cognitive bases to a decision-making situation. Hence, strategic choices are not made based on “real” situations, but rather based on managers’ perceptions (Tacheva, 2007). The premise of UET is that organizational outcomes are directly influenced by the perceptions, values, and expertise of those individuals who occupy prominent managerial positions in the organization (Hambrick and Mason, 1984).

The underlying premise of UET is that executives interpret their strategic environment through their personal experiences, values, and personalities, and their strategic choices are made upon those backgrounds (Hambrick, 2007; Hambrick and Mason, 1984). The theory acknowledges that the outcome performance of organizations is heavily influenced by the individual managers’ choices, in which in turn are affected by their characteristics (Hiebl, 2014). As a result “strategic choices generally own a great deal of behavioural components and reflect decision makers’ idiosyncrasies, such as cognitive base and value preferences” (Chuang et al., 2009).

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