

Green IT/IS Adoption as Corporate Ecological Responsiveness: An Academic Literature Review

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Abstract

This paper provides an academic literature review on the adoption of Green Information Technology (IT) and Green Information Systems (IS) in organizational context. The analysis of studies has been done by a framework with two dimensions, motivation towards the adoption (strategic or idealistic/altruistic) and locus of responsibility (individual or corporate). Based on the adopted framework, the discussion focuses on the status quo of IS literature on the adoption and diffusion of Green IT/IS by organizations from the lens of corporate social responsibility (CSR) and corporate ecological responsiveness (CER). Despite the growing number of papers investigating the adoption of Green IT/IS, the analysis of the study revealed some shortcomings in the existing literature. The implications for the future studies are provided based on the findings.

Keywords: Green IT, Green IS, Adoption, Corporate ecological responsiveness, Corporate social responsibility

1. Introduction

There has been an increasing concern regarding environmental sustainability issues. Moreover, organizations and businesses are under an overwhelming pressure from their shareholders and legislatures to improve their environmental sustainability activities (Butler, 2011; Melville, 2010; Murugesan, 2008). Gärling et al. (2003) listed the environmental issues that organizations face as (1) air pollution (outdoor and indoor), (2) solid waste disposal, (3) topsoil erosion, (4) ozone layer depletion, (5) population growth, (6) marine and fresh water pollution, (7) toxic waste accumulation and disposal, (8) reduction in biodiversity, (9) wetlands destruction, (10) deforestation, and (11) climate modification. This concern regarding the environment and climate by corporations is creating an impetus and ever increasing momentum which sometimes is referred as corporate ecological responsiveness (CER). Based on Bansal and Roth (2000) CER is defined as “a set of corporate initiatives aimed at mitigating a firm’s impact on the natural environment”, in which these initiatives can include changes to the firm’s products, processes, and policies such as reducing energy consumption and waste generation, using ecological sustainable resources, and implementing an environmental management system.

Information Technologies (ITs) and Information Systems (IS) can be considered as two CER initiatives of firm’s response towards environmental sustainability.

Based on a report in 2007¹, information and communication technology (ICT) is responsible for 2% of global greenhouse gas (GHG) emission which is equal to global aviation industry (Webb, 2008). Information Technologies can affect the natural environment through two broad categories named as first order and second order effects (Molla and Abareshi, 2012). The first order is referred to negative impact of IT production, use, and disposal on the environment. This perspective considers IT as part of the problem (Dedrick, 2010; Molla and Abareshi, 2012). So, making IT product, use, and disposal more environmental friendly and greener is referred as Green IT (Dedrick, 2010; Esfahani et al., 2015; Molla, 2013; Molla and Abareshi, 2012; Ryoo and Koo, 2013). The second order effect refers to the positive impact of IT on the environment which considers IT as part of the solution. So, utilizing IT to make business processes and activities greener is known as IT for green or Green IS (Dedrick, 2010; Esfahani et al., 2015; Molla, 2013; Sarkis et al., 2013; Watson et al., 2010). In total, Green IT aims to reduce the 2% global emission from ICT, while Green IS focuses on reducing the remaining 98% by innovative utilization of IT and Information Systems (IS) in business processes which is estimated at approximately 7.8 Gt CO₂ saving in 2020 equals to 15% cut emission and £600 billion of cost saving (Webb, 2008). Though, Green IT and Green

¹ The report can be accessed through
http://www.smart2020.org/_assets/files/02_Smart2020Report.pdf

IS are interrelated concepts, but they have their own focus and purposes.

Califf et al. (2012) asserted that the studies on Green IT and Green IS can be categorized into four groups named as “initiation”, “design and implementation”, “adoption”, and “benefits”. The studies related to initiation category are trying answering the question “What is Green IT and/or Green IS?” Design and implementation embodies the practical utilization of Green IT and Green IS and answer the question “How Green IT or Green IS should be implemented and utilized?” Adoption studies contain the aspects of Green IT and/or Green IS acceptance and adoption and try to answer “What needs to be done for Green IT and/or Green IS to be adopted in different context?” And finally, the studies focus on benefits answer the question “How can Green IT and/or Green IS benefit environment, organization and stakeholders?” The present study tries to contribute to the knowledge of organizational adoption of Green IT/IS. To be effective on environmental sustainability, these Green IS initiatives need not only be developed, implemented and marketed, but also adopted by consumers, so that conventional, less environmentally friendly approaches are replaced. Most of the studies on Green IT/IS are focused on their benefits and design (Califf et al., 2012; Esfahani et al., 2015) while there is a dearth of research on their adoption in IS literature (Esfahani et al., 2015; Lei and Ngai, 2013a, 2013b). Among the adoption studies of Green IT/IS, few of them investigated the formation of the evaluation of Green IT/IS by organizational decision makers together with their intention to adopt Green IT/IS (see, Gholami et al., 2013; Lei and Ngai, 2013a). More specifically, although there is a body of research investigating the adoption of Green IT/IS in the organization level, such research takes place primarily at the macro level where the organization is the unit of analysis (Esfahani et al., 2015). The knowledge on the adoption of Green IT/IS in the organization level will be enhanced by providing a literature review. The objectives of the paper is as follows:

- Identify studies focus on the adoption of Green IT/IS in organization;
- Identify the antecedents of Green IT/IS adoption by organizations and classify them based on their motivation and locus;
- Propose research agendas for researchers interested in investigating the organizational adoption of Green IT/IS.

The paper is organized as follows. We describe the adopted methodology following section. Next, the analysis framework and the related studies are provided. Then it is followed by the discussion and conclusion on the study.

2. Research Methodology

To conduct a comprehensive search for primary studies, we have selected 14 leading MIS journals and 6 MIS

leading conferences¹. The list of journals and conferences are shown in Table 1.

Green, sustain*, Information Technology* and Information Systems* have been selected as our keywords. Selected outlets have been search between 2007 and 2014 by identified keywords through their title, abstract and keywords, because if one paper does not include these keywords in these sections the focus is on another topic.

Table 1
Selected MIS Journals and Conference Proceedings.

Journals	Acronym
Management Information Systems Quarterly	MISQ
Journal of the Association for Information Systems	J. of AIS
Journal of Strategic Information Systems	J. of SIS
Journal of Management Information Systems	J. of MIS
Journal of Information Technology	J. of IT
Journal of Computer Information Systems	J. of CIS
Information Systems Research	ISR
Information Systems Journal	ISJ
Information Systems Frontier	ISF
Information and Management	IM
European Journal of Information Systems	EJIS
Communications of the Association for Information Systems	CAIS
Australian Journal of Information Systems	AJIS
Academy of Management Journal	AMJ
Conferences	
American Conference on Information Systems	AMCIS
Australian Conference on Information Systems	ACIS
European Conference on Information Systems	ECIS
Hawaii International Conference on System Sciences	HICSS
International Conference on Information Systems	ICIS
Pacific Asia Conference on Information Systems	

2.1 Inclusion and Exclusion Criteria

The inclusion and exclusion criteria are used to ensure that just the relevant articles are included in the SLR process.

Inclusion criteria

- All the publications used in our review have been selected based on following criteria:
- Investigate the adoption and diffusion of Green IT/IS.
- Was published in years: 2007-20132.

Exclusion criteria

The papers having the following criteria have been excluded:

- Non-organizational context studies.
- Articles that did not match the inclusion criteria.

From the total identified studies, few of them concentrated on the adoption of Green IT and Green IS. The context of adoption of Green IT/IS can be categorized as organizational and non-organizational, in which the first category refers to the adoption of Green IT/IS initiatives to improve the environmental performance of the firm, while the latent refers to the adoption of Green IT/IS in residential and household contexts to enhance environmental sustainability. As the focus of this study is

² <http://ais.site-ym.com/?ISICitations2011>

³ 2007 has been selected as the base line because the topic was first introduced in IS community by Elliot in PACIS 2007 Proceedings.

on CER and the role of Green IT and Green IS, the studies focused on the organizational adoption of Green IT/IS are elicited and classified based on their levels of analysis.

2.2 Levels of Analysis

In practice, there are three levels of analysis in which the studies related to organizational behaviour¹ are analysed as individual, group, and organization as a whole (Bommer et al., 1987). The individual level (micro) focuses on the analysis of individual characteristics that are crucial to manage and understand the behaviour in organization such as personality and ability, values, moods, perceptions, attitudes and motivations. Related to organizational studies the effect of group or team (meso) characteristics and processes also need to be understood. Group is referred to as “two or more people who interact to achieve their goals” and team is defined as “a group in which members work together intensively and develop team specific routines to achieve a common group goal” (Bommer et al., 1987). A group can influence its members through different ways such as leadership, communication, and decision making.

Many studies also found that the characteristics of organization (macro) itself as a whole have important influence on the behaviour of its individuals and groups. For example, the values and beliefs of organization’s culture can impact the behaviour of individuals. Furthermore, the organization’s ethical behaviour can shape the behaviour and attitude of individuals and groups and thus influence their desire to work towards achieving the goals of the organization.

Overall, we have identified 31 related studies (including journal articles and conference proceeding papers). Selected studies together with their applied theoretical frameworks are summarized in Table 2, categorized based on their unit of analysis.

3. A Framework for Analysing Organizational Green IT/IS Adoption

The corporate adoption of Green IT/IS has to have a purpose and has to be championed, whether for reason of economic reputation management, or as a reflection of individual’s personal values. This invites a question as to whether the adoption of Green IT/IS is complying with the law, based on rational choices, or voluntary actions. Based on Carroll as cited in Hemingway and Maclagan (2004), there are four components that need to be presented for an organization to be considered as socially responsible. There are economic, legal, ethical, and philanthropic responsibilities, in which the philanthropic responsibilities are considered as purely voluntary. So, Liedtka (1991) defined corporate social responsibility (CSR) as “managements’ obligation to set policies, make decisions and follow courses of action beyond the requirements of

the law that are desirable in terms of the values and objectives of society”. This implies that key individuals play a critical role in formulating and implementing of responsibilities of corporates towards the society “corporate social responsibility may be viewed as a process in which managers take responsibility for identifying and accommodating the interests of those affected by the organization’s actions” (Shrivastava, 1995).

As long as CSR is interpreted in this manner and adoption and usage of Green IT/IS initiatives can be considered as exemplars of corporate social and ecological responsibility, “the importance of individuals’ values and motives is raised, and in particular, the corporate as opposed to individual status of ensuing initiative is called into question” (Hemingway and Maclagan, 2004). Thus, Hemingway and colleges (2004) proposed two key dimensions to analyse CSR in practice as motivational basis and locus of responsibility. The first dimension investigates the motivation of corporates pro-socially whether commercially or idealistic, or even altruistic. And the second dimension investigates who takes the responsibility towards CSR, is this corporate or individual?

In order to analyse the adoption studies of Green IT/IS by the firms we have applied the same approach proposed by Hemingway and Maclagan (2004). The analysis framework is depicted in Fig.1. For the purpose of this study the technological dimensions together with factors related to rational choices (e.g. costs, benefits, risks) are omitted from categorization of studies.

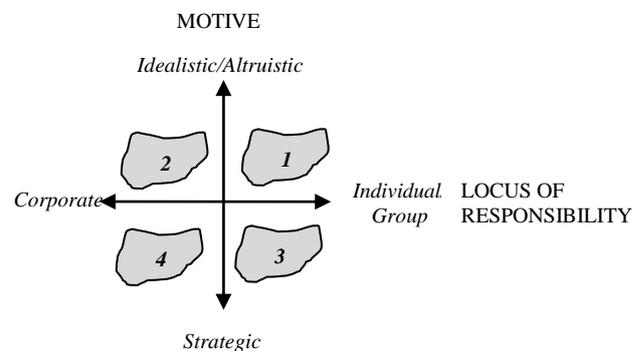


Fig.1. A framework to analyse organizational Green IT/IS adoption (adapted from, Hemingway et al., 2004).

The areas one and two of the framework focuses on the studies on the adoption of Green IT/IS by the firms motivated by idealistic or even altruistic factors where their difference is on their unit of analysis, in which the unit of analysis for the first area is individuals (i.e. micro or meso) and for the second area is the firm itself (i.e. macro). The third and fourth areas of the framework contains the studies in which investigates the adoption of Green IT/IS strategically through micro, meso and macro units of analysis. In the following sections the studies related to each area are stated together with their applied theoretical frameworks in which some of them adapted multi-dimensions in investigating the adoption of Green IT/IS.

¹ “Organizational behaviour (OB) is the study of the many factors that have an impact on how people and groups act, think, feel, and respond to work and organizations, and how organizations respond to their environments” (Bommer et al., 1987).

Table 2
Organizational Green IT/IS studies categorized based on level of analysis.

Level of analysis	Source	Theoretical framework
<i>Micro</i>	Gholami et al. (2013)	Belief-action-outcome (BAO)
	Wati and Koo (2012)	Self-determination theory
	Sacchero and Molla (2009)	
	Sarkar and Young (2009)	
	Lei and Ngai (2013a)	
	Molla et al. (2014)	Belief-action-outcome (BAO)
	Mishra et al. (2014)	Theory of reasoned action (TRA)
	Lei and Ngai (2014)	Norm activation theory
<i>Meso</i>	Koo et al. (2013)	Motivation theory – reference group theory
<i>Macro</i>	Benitez-Amado et al. (2010)	
	Bose and Luo (2011)	Technology-organization-environment, process-virtualization theory, diffusion of innovation
	Schmidt et al. (2010)	
	Kuo and Dick (2010a)	
	Kuo and Dick (2010b)	
	Molla et al. (2011)	
	Molla et al. (2008)	
	Molla and Abareshi (2012)	
	Molla (2008)	
	Butler and Daly (2009)	Institutional theory
	Chen et al. (2011)	Institutional theory, natural resource based view of the firm
	Chen et al. (2009)	Institutional theory, natural resource based view of the firm
	Corbett (2013)	
	Jung et al. (2011)	
	Nedbal et al. (2011)	Technology-organization-environment, diffusion of innovation, transaction cost theory
	S. Y. Ryoo et al. (2011)	Ecological modernization theory, complementarity theory, green practice coordination
	S. Ryoo and Koo (2013)	Resource based view of the firm
Vykoukal (2010)		
Zheng (2014)		
Grant and Marshburn (2014)	Institutional theory, management fashion, status quo bias	
Simmonds and Bhattacharjee (2014)	Resource based view of the firm, advanced model of corporate ecological responsiveness	
Opitz et al. (2014)	Contingency theory	

4. Analysis of the Studies Based on the Framework

From the total 31 identified adoption studies only 12 of them met the criteria to be placed in the analysis framework. The related adoption studies together with their relevant constructs and factors based on proposed analysis framework are presented in Table 2. In the following the studies related to each area of the framework (see Fig.1) are presented together with their utilized determinants and theoretical frameworks.

4.1 Area One: Micro-Idealistic/Altruistic

The studies in which investigate the adoption of Green IT/IS based on idealistic and/or even altruistic motivations and the individual is their unit of analysis are going to be placed in this area of the framework. In the study by Sacchero and Molla (2009), they have investigated to what extent the environmental factors are being considered in ICT decision making. In this study there were no theories or hypotheses to test. They have found that environmental factors play a role when they can demonstrate significant economic benefits to the organization. However, they have asserted that environmental awareness play a significant

role in ICT decision making process. In another study by Gholami et al. (2013) they have investigated the influence of consideration of future consequences (CFC) of senior managers on the adoption of Green IS. They have proposed that individuals high in CFC are more likely towards the adoption of Green IS. Based on their empirical study, they have found a significant relationship between senior managers' attitude and consideration for future consequences with Green IS adoption. The perceived altruism as a construct to predict the adoption of Green IS has been investigated by Wati and Koo (2012), however, had non-significant effect on attitude towards Green IS adoption behaviour.

4.2 Area One: Meso-Idealistic/Altruistic

As depicted in Figure 2, Koo et al. (2013) is the only study that investigates the organizational adoption of Green IS while the level of analysis is group. Utilizing reference group theory, they have tried to show that the relationship between motivation and perception can be moderated under the influence of reference group in using Green IT devices. Besides the other factors, they have investigated the impact of perceived environmental problems on the perceived

usefulness of Green IT devices. However, they found that perceived environmental problems has no direct effect on usefulness of Green IT devices.

4.3 Area Two: Corporate-Idealistic/Altruistic

The studies that fall in this category of the framework investigate the adoption of Green IT/IS motivated by idealistic and/or altruistic factors while the unit of analysis is corporation itself. For example in the study by Schmidt et al. (2010), they have investigated the impact of corporate environmental engagement towards the important of Green IT adoption. They have found that this construct besides the corporate management are the good predictors of Green IT importance. In another study by Lei and Ngai (2013a), besides the other constructs and factors, they have proposed that environmental orientation of organization can positively impact the perception of the managers towards the adoption of Green IT.

4.4 Area Three: Individual-Strategic

This category of studies investigate how strategic motives influence the individuals of organizations (e.g. managers) to adopt Green IT/IS. As long as the factors such as costs, risks, and benefits are always considered in adoption studies, and their impact on individual's decision making are already empirically proven, for the purpose of this paper we only focus on strategic factors proposed by Hemingway and Maclagan (2004), which are image and reputation management, the manipulation of stakeholders, and the integration of organization into its host community. In the study by Lei and Ngai (2013a), they have studied the impact of strategic factors of organization on the managerial perception towards the adoption of Green IT. They have proposed that strategic innovation-, environmental-, and futurity-orientation of organization positively impact the perception of managers towards the adoption of Green IT.

4.5 Area Four: Corporate-Strategic

The focus of these studies in this category is on the adoption of Green IT/IS by the firms in which the locus of responsibility is on corporate itself. Bansal and Roth (2000) in their study investigating why companies go green identified three motivational factors that induce organizations to take responsibility towards environmental sustainability: competitiveness, legitimation, and social responsibility in which these motivation can be mapped to the strategic motivation identified by Hemingway and Maclagan (2004) as well. In the study by Kuo and Dick (2010a), the impact of these motivational factors on the adoption of Green IT and its extent in the organization has been investigated. They have found that the social responsibility motive has a greater impact on the organization in compare to other two motives to extent the

use of Green IT initiatives. In another study again by Kuo and colleges (2010b), they have investigated the influence of motivational factors besides organizational and technological factors on the extent of Green IT in the firm. In the study by Butler and Daly (2009), they have proposed that "business and IT executives are more likely to introduce environmentally responsible programs such as Green IT if doing so enhances their image and attracts Green investors". Drawing from organizational motivation theory, Molla and his colleges (2012; 1996) investigated how eco- efficiency, effectiveness, responsiveness, and legitimacy motives impact the organization towards the adoption of Green IT initiatives. Seidel et al. (2010) asserted that motivation factors including intrinsic/ethics and extrinsic besides other constructs positively influence the successful adoption of sustainability practices by the firm.

5. Discussion and Implications

In this section we analyse and discuss present research in order to identify knowledge gaps and opportunities for future research. The studies on the adoption of Green IT/IS in the corporation level have been analysed following the proposed framework by Hemingway and Maclagan (2004) based on motivation and locus of control. To be effective on environmental sustainability, these Green IT/IS initiatives need not only be developed, implemented and marketed, but also adopted by consumers, so that conventional, less environmentally friendly approaches are replaced. The analysis revealed that most of the studies on Green IT/IS are focused on their benefits and design (Califf et al., 2012) while there is a dearth of research on their adoption in IS literature (Lei and Ngai, 2013a, 2013b). Among the adoption studies of Green IT/IS, few of them investigated the formation of the evaluation of Green IT/IS by organizational decision makers together with their intention to adopt Green IT/IS. More specifically, although there is a body of research investigating the adoption of Green IT/IS in organizations, such research takes place primarily at the macro level where the locus of responsibility is organization itself (see Table 2).

All of the strategic and idealistic motives could be attributed to the adoption of Green IT/IS on the corporate communication agenda, but based on the finding in Table 2, it is obvious that most of the studies are focusing on strategic and commercial imperatives as the drivers of Green IT/IS adoption while the level of analysis is organization itself (e.g., Butler and Daly, 2009; Kuo and Dick, 2010a, 2010b), but following Hemingway and Maclagan (2004) we assert that, although, these drivers (strategic and commercial) are the obvious motives they are not the sole drivers of Green IT/IS adoption in organizations.

Gärling et al. (2003) stated that, besides the corporate issues, the environmental issues are difficult for managers to comprehend for several reasons. First, the environmental issues are considered too complex and scientific which are undetectable and incalculable for managers. Second,

environmental issues are usually direct results of industrial activity, and thus managers face the difficulties of acknowledging fault and changing business systems to counter the detrimental effects of their products and processes. Furthermore, the extensive consequences of environmental issues may far exceed those of many other corporate issues. Thus, “considering these obstacles to managerial comprehension and action, organizations need visible and credible champions to increase understanding and promote initiative on environmental issues” (Gärling et al., 2003). The champions are defined as “individuals who, through formal organizational roles and/or personal activism, attempt to introduce or create change in a product, process, or method within an organization” (Gärling et al., 2003). So, based on Gladwin et al. (1997), it is individual managers who “... often shape the moral environments in which they work ...”. This implies that besides the strategic motivations and rational choices towards the adoption of Green IT/IS by organizations, the values and altruistic motivations of individual managers can impact social and ecological responsibility of organization towards the adoption of Green IT/IS. This claim is also in line with the study by Melville (2010) who says “How do the distinctive characteristics of the environmental sustainability context, such as values and altruism, affect intention to use and usage of Information Systems for environmental sustainability?”

To answer this research question and fill this gap in body of knowledge of Green IT/IS adoption some authors considered individual constructs besides other ones to study the effect of them on individuals towards the adoption (See Table 2: micro/meso-idealistic/altruistic). But while the idealistic and/or altruistic motives are studied besides other motives they show the negative impact on the intention and behaviour towards the adoption of Green IT/IS. For example, in the study by Wati and Koo (2012), they have studied the influence of perceived altruism besides other constructs on the adoption of Green IT/IS, but they have found a non-significant effect of this motive on attitude toward Green IS use behaviour. This introduces the notion of personal values as drivers of Green IT/IS adoption in the level of organization (Hemingway and Maclagan, 2004; Melville, 2010). Based on Rubin and Rubin (2012), values are “desirable goals, varying in importance, that serve as guiding principles in people’s lives”. In another study by Thomas M Jones (1991), they have defined values as “(a) concepts or beliefs, (b) about desirable end states or behaviours, (c) that transcend specific situations, (d) guide selection or evaluation of behaviour or events, and (e) are ordered by relative importance”. Our position is in line with Hemingway and Maclagan (2004) and Melville (2010) in that individual managers’ organizational decisions are driven by a variety of personal values and interests, in addition to the official corporate objectives. This claim is supported through the literature which shows that CSR can be the result of championing by a few managers, due to their personal values and beliefs, despite the risks (in terms of commercial and subsequent personal outcomes) associated with this (Hemingway and Maclagan, 2004).

None of the studies on Green IT/IS adoption in organization has investigated how the personal values of organizations’ individual managers can influence their beliefs towards environmental issues. The importance of manager’s environmental attitudes on corporate environmental responsiveness has been already highlighted in the literature (e.g., Gifford et al., 2011; Trevino, 1986). They suggest that “managers who are aware of the consequences of human-nature interaction and feel compelled to take corrective actions, view organizations as a field to materialize their environmental concerns, by making the appropriate strategic decisions” (Trevino, 1986). Future research can fill the gap by investigating how managers’ personal values can influence their intention and behaviour towards the adoption of Green IT/IS and corporate ecological responsiveness which would be an empirical support to Bansal (2005) premise who asserted “individuals with environmental attitudes might influence the greening of their organizations, and offers new avenues for future research”.

Moreover, there is a scarcity of studies investigating the influence of corporate strategic motives on organizations’ decision makers’ intention towards adoption of Green IT/IS and their actual usage. There is only one study by Lei and Ngai (2013a) that investigated the impact of corporate innovation-orientation, environmental-orientation, and futurity-orientation on perception of the managers towards the adoption of Green IT. Also, the studies on how the organizational factors influence the intention and behaviour of individuals to the adoption of Green IT/IS is limited (Gholami et al., 2013). Hunt and Vitell (1986) asserted that values have an important influence on organizational behaviour including organizational ethics. They have suggested that the values of organization, leaders and members impact the ethical behaviour of organization. The future studies can investigate how corporate social responsibility motivations (i.e. image and reputation management, the manipulation of stakeholders, and the integration of organization into its host community) together with organizational values and ethics can influence the perception of managers to adopt Green IT/IS initiatives.

Furthermore, as it is obvious from Fig.1 and Table 2, the knowledge regarding the utilization of Information Systems in sustainability transformations of organizations (i.e. Green IS) is largely absent in the literature, which this claim is also supported in other studies (e.g., Elliot, 2011; Thomas M. Jones, 1980; Melville, 2010; Watson et al., 2010). This suggests the researchers to do empirical studies as a suitable strategy to develop insights, as the potentials of Information Systems to positively contribute to environmental transformation of organizations are already proven (Thomas M. Jones, 1980).

Table 3
Organizational Adoption of Green IT/IS Studies based on Motive and Locus of Responsibility.

Source	Level of analysis			Motive		Determinant
	Micro	Meso	Macro	Idealistic/Altruistic	Strategic	
Sacchero and Molla (2009):	✓			✓		Environmental factors
Gholami et al. (2013)	✓			✓		Consideration of future consequences
Koo et al. (2013)		✓		✓		Perceived environmental problems
Wati and Koo (2012)	✓			✓		Perceived altruism
Lei and Ngai (2013a)						Environmental orientation of organization, innovation-orientation, environmental-orientation, futurity-orientation
Schmidt et al. (2010)			✓	✓	✓	Corporate environmental engagement
Kuo and Dick (2010a)			✓		✓	competitiveness, legitimation, social responsibility
Kuo and Dick (2010b)			✓		✓	competitiveness, legitimation, social responsibility
Butler and Daly (2009)			✓		✓	corporate image
Neuzil and Kovarik (1996)			✓		✓	eco-efficiency, eco-effectiveness, eco-responsiveness, eco-legitimation
Molla and Abareshi (2012)			✓		✓	eco-efficiency, eco-effectiveness, eco-responsiveness, eco-legitimation
Seidel et al. (2010)			✓	✓		intrinsic/ethics, extrinsic

Finally, following Krajhanzl (2010), who asserted that “organizations do not make decisions – [but] individuals do”, the organizational decision makers’ decision to adopt Green IT/IS is based on a complicated mix of both pragmatic (e.g. financial and legal) and idealistic (e.g. moral and ethical) considerations (Chen et al., 2011). On the one hand, the adoption of Green IT/IS creates financial concerns, in which they may reduce costs or cause additional expenses. Green IT/IS also may have legal ramifications, in which the government started to create policies to penalize the energy waste and reward for decreasing emissions. On the other hand, the adoption of Green IS highlights the idealistic implication of these technologies, in which the decision makers’ adoption may have positive or negative consequences for others (Chen et al., 2011). The organizational decision makers’ reaction to environmental problems is considered as both moral and ethical because of its impact on other stakeholders. These idealistic and pragmatic considerations of firms to adopt Green IS are not necessarily conflicting or at odds with another one. Undeniably, the adoption of Green IT/IS has both consequences on the firm (e.g. impacts on cost, productivity, and legal fines) and also on others (e.g. moral and ethical impacts on other stakeholders such as natural environment itself and future generations) (Chen et al., 2011). The future researchers are encouraged to investigate organizational decision makers’ intention and proenvironmental behaviour towards the adoption of Green

IT/IS as the Information Systems research in this line of study remains scarce (Lei and Ngai, 2013a, 2013b; Melville, 2010).

6. Conclusion

We have conducted a literature review from identified 25 related studies in the period from 2007 to 2014 on the studies related to the adoption of Green IT/IS in organization level. To analyse the antecedents of Green IT/IS adoption we have adopted the same approach proposed by Hemingway and Maclagan (2004). From analysis of our sample articles, we have identified some shortcomings of existing literature and derived recommendations for future research. In particular, there is a gap in studying the influence of values (including organizational and personal) on the intention of corporate managers to adopt these initiatives. Moreover, we see the need to investigate the impact of strategic and altruistic motivations of the corporate on individuals’ perception towards the adoption of Green IT/IS. Finally, we encourage the future researchers to study how values, beliefs, and norms influence the environmental behaviour of individual managers which ultimately motivate them to adopt Green IT/IS as their corporate ecological responsiveness initiative.

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