

Exploring the Roles of Social Structures, Employees' Green IS Orientation and Employee Commitment in Routinization of Green IS Practices in Organizations

Research-in-Progress

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Abstract

There is growing recognition of the role of Green IS practices (GISP) in mitigating environmental problems. Research indicates that in addition to contributing towards sustainability, GISP has the potential to contribute to organization's bottom line and improve stakeholders' image of the organization. Consequently, there is an upward trend of organizations adopting GISP. However, to realize fully the benefits of GISP, it must be engrained and entrenched into the organizational processes, i.e., GISP needs to be routinized. So far, research on GISP has been limited to one shot adoption decisions while ignoring the process of routinization. Drawing from the literature on structuration and internal market orientation, we examine the impact of organizational meta-structures and internal market Green IS orientation on employee commitment and its subsequent impact on routinization of GISP. Furthermore, addressing the inconsistent findings in the literature, this paper also examines the impact of routinization on tangible and intangible organizational benefits.

Keywords

Routinization of Green IS practices, Structuration, Internal market orientation, Employee commitment, Organizational benefits.

Introduction

Due to a global upsurge in the awareness about environmental issues, organizations are under extreme pressure from customers, society, stakeholders, government and other regulatory agencies to adopt environmentally sustainable practices in creating and delivering their products and services (Butler, 2011; Melville, 2010; Murugesan, 2007). Environmental sustainability has been defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987, p. 43). As exemplars of environmental sustainability initiatives, many leading organizations like HP, SAP, IBM and Microsoft have included greener practices into their business operations. For example, HP's commitment towards reducing environmental impact of their operations has resulted in a 20% reduction in Greenhouse Gas Emissions (GHG) from a period of 2005 to 2012 (HP, 2012). For the same period, IBM also reported a reduction in GHG emissions by 12% (IBM, 2012).

There is growing recognition of the role of Green IS practices (GISP) in mitigating environmental problems. Research indicates that in addition to contributing towards sustainability, GISP has the potential to contribute to an organization's bottom line as well as improve stakeholders' image of the organization. In spite of growing interest in the implementation of Green IS, research suggests that there are inconsistencies among firms' Green IS interests, adoption, and routinization of GISP. According to research, 25% of IT leaders are concerned about environmental sustainability; however, only 10% of them have actually adopted GISP (InfoTech-Research Group, 2009). Further, despite an increase in the adoption of GISP and sustainability projects, only 30% of companies that have adopted GISP have

routinized GISP into their business strategy (Chen et al., 2008; Symantic, 2009). These findings are in line with the findings in the literature on innovation (product/service/process that is new to the organization): initial adoption of any innovation rarely translates into full diffusion in many organizations (Zhu et al., 2006). As noted by Fichman and Kemerer (1999), there is an “assimilation gap” – a lag between adoption and actual usage of innovations in many firms.

Assimilation of technological innovations is an ongoing, complex and adaptive process (Meyer and Goes, 1988). Once the technological innovation is adopted, it needs to be accepted and routinized/infused in the organizational processes. Routinization of innovation is a very crucial stage wherein organizations redefine their business processes, develop new competencies around technology, and cultivate complementary structures and norms (Maheshwari et al., 2010). Accordingly, there is a pressing need to understand the process of routinization of GISP, since the major benefits of complex organizational innovations are realized in the post-implementation phases of the assimilation process when they are engrained and routinized in the organization (Davenport and Brooks, 2004; Maheshwari et al., 2010). Routinization of GISP has the potential to give organizations tangible (financial benefits) and intangible (improvement in stakeholders’ perceptions about the company) benefits. Further, routinization is essential for making a significant positive impact on the environment. Hence, this study focuses on the factors that influence routinization of GISP in organizations.

In IS literature, the adoption stage of technological innovations has been extensively studied over the last several years. Specifically, there is a growing stream of research focusing on the adoption of GISP in organizations. Despite its importance, very few studies have delved into details of how GISP is routinized within the organization in the post-implementation phase. The lack of empirical studies in IS literature limits our understanding of the routinization of GISP. Drawing from the structuration theory and the literature on internal market orientation (IMO), this study examines factors that lead to routinization of GISP.

Structuration theory has been used previously to inform studies related to IT innovations such as the assimilation of e-business (Chatterjee et al., 2002), e-government systems (Hossain et al., 2011), computer-aided software engineering technology (Purvis et al., 2001), and e-procurement (Rai et al., 2009). The theory focuses on the relationship between social structure and human actions and suggests that any organizational phenomenon is a consequence of individual actions, which are shaped by organizational meta-structures (Giddens, 1984). These meta-structures reinforce or alter cognitions, behaviors and patterns of action that reproduce these prevailing structures and generate expected behaviors. Prior studies have mainly investigated the direct linkages between meta-structures of signification, legitimization, and domination and the IS phenomena. However, studies have failed to incorporate the notion that the influence of these meta-structures is always conditional upon individual’s action towards them (Alvesson and Willmott, 2002). In the context of this study, we argue that the influence of meta-structures on routinization of GISP is mediated by employees’ commitment to GISP. While top management and other organizational structures can have a significant influence on the initiation and adoption of green practices, routinization of GISP (incorporating GISP in the day to day operations of the organization) is not possible without employee commitment to GISP. Therefore, this study proposes that meta-structures influence employee commitment to GISP which in turn impacts routinization of GISP.

Further, research suggests that the structuration theory does not comprehensively explain routinization of practices. Since all individuals experience similar modalities of signification, domination, and legitimization, there is a lack of understanding on how some social practices are successfully institutionalized in the organization while others do not attain the same success (Rose, 1998). In an attempt to address this limitation of the structuration theory, we draw from the literature on internal marketing, i.e., the concept of internal market orientation (IMO). IMO is an inward marketing focus directed at employees, which aligns and motivates employees to adopt and enact strategic directives of organization. Among other things, IMO has been found to positively impact employees’ commitment towards organization (Berry and Parasuraman, 1991; Lings and Greenley, 2010). This study proposes that internal market’s green IS orientation (inward marketing of GISP and its benefits directed at employees and other stakeholders) will favorably influence employees’ commitment toward routinization of GISP.

Further, the research on the relationship between environmental practices and organizational outcomes such as social and economic performance of an organization is limited and inconclusive (see Ahmed et al.,

1998; Freeman, 1994; Hart, 1995; Judge and Krishnan, 1994). This study suggests that inconclusive findings could be the result of studies including firms that have adopted but not routinized GISP. Hence, this study posits that routinization of GISP will result in tangible and intangible benefits for the organization.

The rest of the paper is organized as follows. The next section provides a review of the relevant literature on green IS, GISP routinization, a summary of the structuration theory and a summary of the IMO literature. This is followed by the proposed conceptual framework and the propositions. The paper concludes by discussing the implications for research and practice.

Literature Review and Theoretical development

Green IS

Several definitions and conceptualizations of Green IS have been proposed by prior research. For the purpose of this study, we adopt the definition of Green IS by Loeser (2013) that “refers to practices which determine the investment in, deployment, use and management of information systems (IS) in order to minimize the negative environmental impacts of IS, business operations, and IS-enabled products and services”. Examples of green IS initiatives include virtualization of servers, energy efficient data centers, advanced automation technologies, asset disposal to include equipment recycling, use of collaborative systems to reduce environmental impact associated with travel, installation of environmental management systems to track and analyze corporate waste and emissions and so on.

Prior research has considered IS as a part of problem as well as solution to the environmental problems (Jenkin et al., 2011; Molla et al., 2009). The extensive use of information technologies by organizations can have detrimental influence on the environment footprint of organizations. For example, due to shorter product life spans of IT, disposal of IT equipment have raised several environmental concerns. Each stage of IT lifecycle from production to use to disposal can pose a serious threat to environment. Further, it is reported that ICT industry is responsible for producing 2% of global CO₂ emissions, equivalent to the emissions generated by aviation industry (Molla et al., 2011). Estimates indicate that in terms of generating carbon footprint, use of technology is quickly surpassing air transportation industry (Dembo, 2008). On the other hand, GISP has a potential to reduce global emissions by 15% (The Climate Group, 2008) and is considered as a key enabler for environmental sustainability (Butler, 2011). Organizations can therefore adopt and routinize GISP that minimize their environmental impact as well as achieve tangible and intangible benefits.

GISP Routinization

The extant IS literature has examined the process of routinization by means of stage-based models. Zmud (1982) examined the diffusion of software practices in three stages: initiation, adoption, and implementation. Similarly, Meyer and Goes (1988) conceptualized assimilation of medical innovations using three primary decision-making stages: knowledge-awareness stage, evaluation-choice stage, and adoption-implementation stage. Kwon and Zmud (1987) later developed a six-stage model for IS innovation diffusion: initiation, adoption, adaptation, acceptance, routinization and infusion. While examining the assimilation of interorganizational business process standards, Bala and Venkatesh (2007) conceptualized four stages of assimilation: awareness, adoption, limited deployment, and general deployment. Alternatively, some researchers have categorized these stages into three general phases of pre-adoption, adoption, and post-adoption (Damanpour and Schneider, 2006). Pre-adoption is concerned with the active and passive scanning of organizational needs, recognition of problems and solutions; becoming aware of existing innovations and proposing some of the innovations that are germane to the organizational needs. Adoption stage reflects the decision to accept the innovation by evaluating the proposed idea from technical and financial perspectives, and allocating resources to the innovation for its acquisition and implementation (Meyer and Goes, 1988). Post-implementation, referred as routinization in this study, occurs when innovation is incorporated into the regular activities and become a routine feature of the organization (Rogers, 2003). Fichman (2001) defines routinization as “the extent to which an innovation has become a stable and regular part of organizational procedures and behavior” (p. 430). Routinization has also been considered as a significant dimension of IS success (DeLone and McLean, 1992). GISP routinization, thus, is defined as the phase in which GISP is widely incorporated into firm’s

value chain activities. Routinization of GISP emerges as the last stage of the assimilation process that has the potential to impact environmental as well as organizational outcomes (tangible and intangible benefits). Therefore, it is important to examine the antecedents of GISP routinization using appropriate theoretical lens. This study draws from the literature on structuration and IMO to understand the factors that influence GISP routinization.

Structuration Theory

The structuration theory proposed by Giddens (1984) focuses on the relationship between social structure and human actions. The theory identifies three institutional structures that influence the behaviors and cognitions of individuals: 1) structures of signification 2) structures of domination, and 3) structures of legitimization. Individuals apply structures of signification as cognitive guides to understand how they should behave/act with respect to new technology assimilation. Individuals draw upon structures of legitimization as normative templates to validate specific behaviors and draw upon structures of domination to ensure that their assimilation actions do not violate institutional rules (Chatterjee et al., 2002). Thus, these institutional structures are utilized by individuals to make sense of the new technology/processes, gather the resources needed to incorporate the technology/processes into day to day organizational tasks, and take other initiatives required for the assimilation of the technology/process. Further, the theory suggests that the institutional structures of signification, legitimization, and domination can be manipulated through organizational actions called meta-structures.

Therefore, applying structuration theory to our context, it can be argued that GISP routinization is the aggregate action that emerges from individual structuring actions, whose cognitions and behaviors are influenced by institutional meta-structures. The three institutional meta-structures identified in the literature are: meta-structures of signification, meta-structures of legitimization, and meta-structures of domination (Orlikowski et al., 1995). These three meta-structuring actions that constitute internal and external organizational factors may either reinforce or alter cognitions and behaviors of individuals/employees leading to routinization of GISP.

Meta-structures of signification

Meta-structures of signification are established by strategic, relational, and technological context in which green IS is interpreted and utilized (Hossain et al., 2011; Rai et al., 2009). These meta-structures serve as cognitive guides to understand appropriate behavior or actions with respect to GISP routinization. Top management leadership and competitive pressures serve as meta-structures of signification.

Meta-structures of domination

Meta-structures related to political, financial, and technological resources validate employees' behaviors associated with GISP routinization (Hossain et al., 2011; Rai et al., 2009). Organizational readiness and lack resources are identified as meta-structures of domination through which employees' actions and behaviors pertaining to GISP routinization are validated.

Meta-structures of legitimization

Meta-structures of legitimization are defined by the norms or rules governing sanctioned or appropriate conduct (Gordon, 1993). The actions and behaviors of individuals can be regulated by establishing formal rules and policies for GISP. Green IS standards efficacy serves as meta-structures of legitimization.

Internal Market Green IS Orientation

The role of internal marketing (IM) has been well recognized within the marketing literature. Organizations are increasingly adopting an internal marketing philosophy by developing an internal market orientation (IMO) to understand the needs of employees and increase their job satisfaction and commitment (Lings and Greenley, 2010). IM is considered as the application of marketing-like approach and tools within the organizations to align, motivate, and integrate the employees towards the implementation of organizations' strategies. IMO is grounded in the belief that employees constitute the internal customers, while employment constitutes the internal product (Lings, 2004). Further research on

internal marketing suggests that IMO can have significant impact on several aspects of organizational performance by influencing internal aspects of performance such as employee satisfaction, employee retention, and employees' commitment towards organization.

Extending the concept of IMO to green IS, we define internal market green IS orientation (IMGO) as the process of aligning, integrating and motivating employees to appreciate and understand and implement GISP in their day-to-day activities. Lings (2004) identified three dimensions of IMO: internal market research, internal communication, and internal responsiveness. In the context of GISP, internal market research can be conducted within the organization to identify the motivations of employees, social and environmental needs regarding green practices, and potential barriers or concerns that restrict them from adopting GISP. Internal communication refers to the diffusion of information from managers to employees regarding organization's green IS strategies, and external market such as regulatory and legislative changes, and activities of competitors. Internal responsiveness is the manipulation of financial and non-financial rewards to encourage the employees to follow GISP. Drawing from the literature on IMO, this study posits that successful implementation of IMGO will have a significant impact on employees' commitment toward GISP routinization.

Conceptual Framework and Propositions

Drawing from the literature on GISP Routinization, Structuration, and IMO, the conceptual framework (Figure 1) presents meta-structures and IMGO as antecedents to employee commitment towards GISP. Employee commitment to GISP will lead to routinization of GISP which will result in tangible and intangible benefits to the firm.

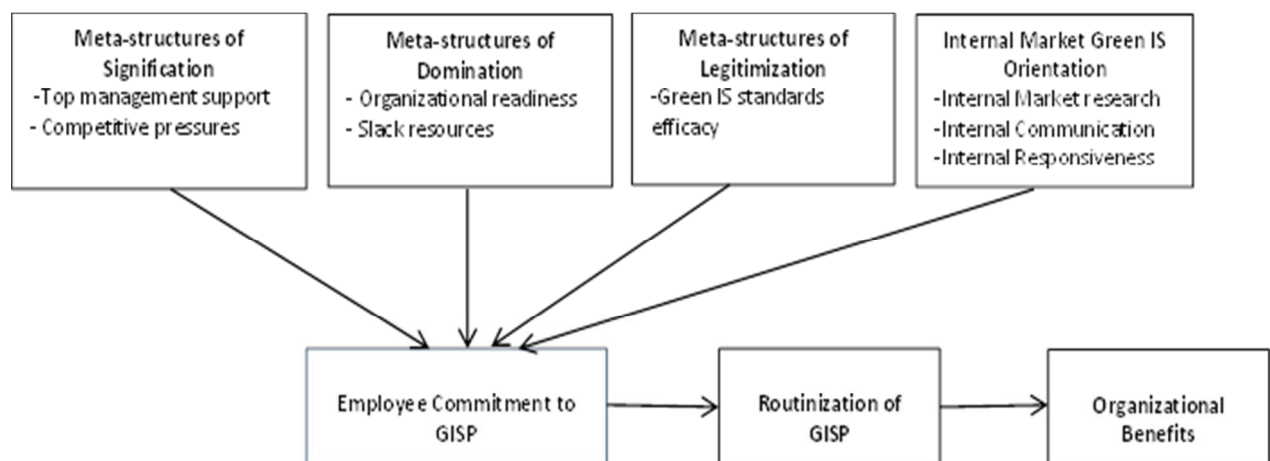


Figure 1: Conceptual Framework

Meta-structures of signification:

Top management support has a significant role in shaping the norms, values, and beliefs of employees. Through their support and participation, top management can significantly help in (i) articulating the vision, the viability and the benefits of routinizing GISP practices, and (ii) establishing a strategic plan to routinize these practices (Chatterjee et al., 2002; Rai et al., 2009). Top management actions and support serve as important meta-structures of signification that will influence the employees' commitment toward GISP. Knowing that the top management is committed to GISP will favorably influence the employees' commitment to GISP.

P1: Top management support is positively related to employee commitment towards GISP.

Competitive pressures refer to the degree of pressure experienced from the competitors within the industry (Zhu and Kramer, 2005). Employees' perceptions about the benefits derived by structurally equivalent competitors from routinization of GISP will influence their own commitment to GISP since

they would want their organization to reap similar benefits and not be *left behind*. Therefore, the involvement of competing organizations in GISP will increase the employees' commitment to the routinization of GISP.

P2: Competitive pressures are positively related to employees' commitment towards GISP.

Meta-structures of domination:

The meta-structure of domination is embedded in two types of resources: allocative and authoritative resources. The former arise from command over objects, goods and other material phenomena while latter arises from capabilities to organize and coordinate the activities of social actors (Giddens, 1984). These resources are means through which individuals can realize their intentions, accomplish their goals, and exercise power (Rai et al., 2009). Organizational readiness and slack resources serve as meta-structures of domination that influence employees' beliefs and commitment.

Organizational readiness refers to the extent to which an organization possess sufficient IT infrastructure and have availability of technological and human resources to incorporate innovation in its value-chain activities. Organizational slack refers to the commitment of financial resources for GISP as a proportion of total organizational resources (Hameed et al., 2012). Routinization of GISP is a resource-intensive process that requires appropriate commitment to the financial resources. Prior research has demonstrated that organizational slack is key for IS innovation diffusion (Bose and Luo, 2011).

Routinization of GISP is a resource intensive process. Lack of organizational readiness and organizational slack will be barriers to routinization of GISP. Even if the employees understand and appreciate the need for GISP, in the absence of the required IT infrastructure and technological, financial and human resources, employees will not be willing to incorporate GISP in their day to day activities. Therefore, the availability of these resources is critical to employees' commitment to engage in GISP.

P3: Organizational readiness is positively related to employees' commitment towards GISP.

P4: Organizational slack is positively related to employees' commitment towards GISP.

Meta-structures of legitimization:

By adopting certain green IS standards, organizations specify how to execute tasks and signal that compliance to these standards is the approved mode of action. Green IS standard efficacy can be defined in terms of: comprehensibility and flexibility. While comprehensibility is the scope of these standards to measure Green IS initiatives, flexibility is the range of user behavior that can be measured by green IS standards. The rules and policies embedded in the Green IS standards govern the conduct of employees, thus serving as meta-structures of legitimization (Rai et al., 2009). The availability of standardized processes, comprehensive, and flexible standards provides a reliable framework to evaluate and measure Green IS initiatives by the employees, thereby increasing their commitment towards GISP practices.

P5: Green IS standards efficacy is positively related to employees' commitment towards GISP.

IMGO

The formulation of internal market orientation strategies have been reported to have several important benefits for the organization. Prior studies have established positive linkages from internal marketing to internal aspects of performance in general and employee motivation in particular (Gronroos, 1981). Internal research on employee's attitudes regarding GISP, effective communication of external information, and the manipulation of rewards and bonuses for practicing green IS can significantly impact employees' commitment towards GISP.

P6: IMGO is positively related to employees' commitment towards GISP.

Employee's Commitment toward GISP

Employee commitment is defined as an energizing force that binds an employee to a course of action (Meyer and Herscovitch, 2001). The role of internal aspects of performance such as employees' commitment on external aspects of performance, such as realization of organization's strategic objectives, is well documented in the IMO literature (Comm, 1989; Lings and Greenley, 2009). Routinization of GISP is an organizational objective that can be executed successfully when employees demonstrate commitment towards GISP. Since routinization of GISP involves embedding GISP in the day to day activities, employees' commitment to GISP will be paramount to the successful routinization of GISP.

P7: Employee's commitment towards GISP is positively related to GISP routinization.

Organizational Benefits

Prior research on IS assimilation has emphasized that organizational benefits of a complex innovation are realized when innovation is engrained into organizational processes and strategies. Routinization of GISP is a complex process and is proposed to result in better environmental, financial and other intangible benefits. Further, several studies have reported a positive relationship between environmental initiatives and corporate reputation, and brand image (Melnik and Calantone, 2003; Naffziger et al., 2003; Rusinko, 2007). Thus, by incorporating GISP into business processes, organizations can reap financial benefits as well as intangible benefits in terms of enhanced brand image among customers, vendors, and society in general.

P8a: Routinization of GISP is positively related to the financial performance of the firm.

P8b: Routinization of GISP is positively related to the stakeholders'¹ image of the firm.

Implications

This study has important implications for both research and practice. Prior research on GISP has mainly focused on the adoption stage of the assimilation process. Given the potential of GISP to resolve environmental issues while providing tangible and intangible benefits to the firm, this study focuses on the under-researched routinization phase of green IS adoption process. In doing so, this study contributes to the literature on the post adoption stage of IS assimilation in general and green IS in particular.

Further, this study extends the structuration theory to examine its role in the routinization of GISP. Drawing from prior research, we argue that it is inappropriate to examine the direct impact of meta-structures on the IT phenomena of interest. Since meta-structures influence individual's cognition/behaviors which in turn influence the IT phenomena, we have conceptualized that organizational meta-structures influence employee commitment which in turn influences routinization of GISP. This study also draws attention to the need to examine employee commitment while examining routinization processes since routinization of a technology/process involves embedding the new technology/process into the existing day-to-day processes performed by the employees of the firm.

Furthermore, this study also makes an important contribution by adapting the IMO construct from the marketing literature and utilizing it in the green IS context to capture the mediating impact of individuals' internal disposition on GISP routinization. By doing so, this study also addresses the need for applying biographical motives to capture a complete view of social interaction that was lacking in the previous structuration frameworks applied in IS literature.

Finally, this study contributes to the literature on the benefits of adopting GISP that are currently inconclusive. Drawing from well established theoretical foundations, this study posits that routinization is the key to achieving tangible and intangible benefits. We contend that the mixed findings in this Green IS literature are due to infrequent routinization of GISP in organizations.

This study also has important implications for practice. This study draws the attention of firms toward the role of employee commitment in successfully routinizing GISP. Also, organizations need to be informed of

¹ For the purposes of this study, stakeholders include customers, partners, and society.

the role of organizational meta-structures such as top management support, organizational slack, Green IS standards, etc. in motivating employees to commit to GISP. Further, this study will potentially inform practitioners about the need for IMGO to develop employees' commitment toward the routinization of GISP. Future research needs to focus on expanding the literature on IMGO by providing detailed guidelines on what steps need to be taken to develop IMGO in organizations. Finally, this study informs practice that long term tangible and intangible benefits of green IS implementations can be realized by routinizing GISP.

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