Chapter 14
Green IS:
Steps Towards a Research Agenda

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ABSTRACT

In this chapter, the authors investigate the role of ICT in dealing with environmental challenges facing contemporary industrial organizations. Green IS research can essentially be divided into two groups, focusing on technology per se or on providing tools that decreases environmental impact. Building on a planned research project the authors propose innovation of ICT-based services, and especially collaborative services, as useful strategies for providing firms with sense and respond capabilities in relation to environmental challenges. They also argue research that research relevance and multi-disciplinary competencies are key themes that IS researcher needs to acknowledge in order to contribute to practitioners efforts.

INTRODUCTION

During the past decades decision makers worldwide have been faced with the accumulated and threatening effects of industrialization. The far-reaching effects of industrialization include pollution of land, water and air and most decision makers are in agreement that we urgently need a change in direction. To this end, almost all business decisions today involve the consideration of environmental issues. Decisions about productivity, efficiency and maintenance are all deeply entangled with environmental issues as both economical and technological advances need to be sustainable (Bryson & Lombardi, 2009). But despite the pervasiveness of environmental issues, most firms remain confused about the meaning of sustainability. In fact, managers for industrial firms are faced with a complex nested system as they

DOI: 10.4018/978-1-61520-692-6.ch014

are forced to recognize how the firm's economy is part of a larger ecological system. However, most firms persist in treating environmental and economic performances as independent components. The link between economic and environmental performance remains enigmatic, despite the myriad of laws and regulations established the past few years.

The growing attention to environmental issues and the need for sustainable development in today's industrial landscape have brought to the surface some significant challenges in the way in which many firms generate, process, and manage information (Fairbank et al., 2006). Taking the process industry as an example, process industry firms rely on information and communication technology (ICT) in their daily operations. The scale and complexity of the information required and produced in their operations are massive, and as the demands for sustainable production increase this puts additional pressure on the information processing capabilities for these firms. Without some mechanisms in place to manage and process information, decision makers in these firms might not fully understand the financial, operational, and environmental implications of their operations.

These challenges derive from three distinctive yet interrelated aspects. First, it derives from the incompleteness of information available for planning and decision making (Fairbank et al., 2006). Such incompleteness may be associated with the lack of systematic efforts in collecting information, or result from information being managed by one part of the organisation but not shared with others (Holmström & Boudreau, 2006). Second, the challenge can derive from ineffective understanding of information requirements from internal or external stakeholders (Sauer & Willcocks, 2002). Third, the challenge can derive from the demand for speed in obtaining and processing information (Prahalad & Krishnan, 2002). Many organisations are recognizing their failure in effectively using ICT to leverage their businesses and the inability to address some, or all, of the above challenges is connected closely to an organisation's information processing capability (Fairbank et al., 2006).

Building upon the need to simultaneously address financial and environmental goals, the emphasis of this paper is on how organisations can address such demands and challenges by innovating their information processing capability enabled by ICT. We conclude the paper by discussing challenges posed by the environmental goals for the information systems field to further improve our research skills and methods. We are particularly interested in what ways ICT-based services can help to steer decision making in paths that are in concert with a sustainable development for the firm. If one takes a closer look at the conditions under which decision making are made in industrial firms – with all the associated economical and environmental consequences – the most fundamental condition concerns the incomplete knowledge on the part of the industrial firm. This is clearly the case when a company is forced, either by a new regulation or a local opinion, to reconsider its production rationale. The above suggests that the most rational strategy for a company facing changes in their production processes is to engage in open innovation projects to engage external expertise in solving the problem. We see two reasons for this: (1) today's industrial firms lack the knowledge needed to successfully address the environmental challenges facing them, and (2) the uncertainty and equivocality related to these challenges are high.

In this chapter, we investigate innovation of ICT-based services as a potential solution to the aforementioned problems. These services would have to leverage each firm's existing information infrastructure, they would have to effectively utilize available knowledge about sustainability, and, not least, they would have to effectively integrate information for decision making so that financial, technological, and environmental issues were treated in a coherent and systemic fashion. Specifically we will investigate the following research questions: