Green IS

Information Systems for Environmental Sustainability

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The environment is deteriorating because of human activity and disturbance, and there is a very real need to address this problem, because it puts at serious risk the basis of human civilization (World Commission on Environment and Development 1987). Information systems (IS) have been identified as a key enabler for transforming organizations and society towards more environmental sustainability (Elliot 2011), and many IS researchers would agree that the IS discipline should contribute something to the betterment of our environmental footprint. While in the past, information technology (IT) was mostly seen as a contributor to environmental degradation throughout its lifecycle as it consumes resources and causes waste and emissions, there has been a growing awareness that IS as socio-technical systems using IT to transmit, process, or store information (Piccoli 2008) can also be an enabler for sustainable processes, services, and products (Melville 2010; Watson et al. 2010; Seidel et al. 2013; vom Brocke et al. 2013). For instance, Green IS are expected to create an impact on individual beliefs about environmental sustainability (Melville 2010), enable more sustainable work practices through virtualization and remote work (Bose and Luo 2011), enable organizations to meet compliance imperatives and social norms (Butler 2011), or increase resource efficiency (Watson et al. 2008), amongst others. There are also many examples, where existent IS are re-interpreted in the light of new environmental goals, for instance, the reduction of carbon emissions – just think of the use of business intelligence systems in order to provide environmental data so as to support sense-making or decision-making processes (Seidel et al. 2013). The key question is: How can the transformative power of IS be leveraged in order to contribute to the creation of an environmentally sustainable society?

We argue that the IS discipline is in a unique position to seek answers to this question and contribute significantly to resolving the environmental problem: First, IS has been increasingly perceived by academics as a solution-oriented discipline (though this is how practice has long viewed IS) that seeks to develop new and purposeful systems to solve contemporary business and societal problems (Gregor and Jones 2007; Hevner et al. 2004). Our discipline may thus contribute innovative solutions to react to emergent social, cultural, and also legislative pressures originating from the challenge of environmental sustainability, as well as proactively help to implement sustainability objectives. Second, IS scholars can also follow the traditional social science model of seeking to understand the design, adoption, use, and effects of information systems from a behavioral research perspective. With regards to Green IS such research may, for instance, identify the factors that impact on individual or organizational adoption of Green IS as well as their effects.

This role of IS to provide solutions for environmental problems and support ecological sustainability has been underlined in recent calls (e.g., Loos et al. 2011; Pernici et al. 2012; vom Brocke et al. 2013). Researchers have stated that the IS discipline should investigate to which extent existent approaches to IS development are appropriate for the design of Green IS (Seidel et al. 2013; Zhang et al. 2011), or what are effective design approaches to develop IS that impact on human actions about the environment (Melville 2010). In this line of thinking, the special interest group for Green IS (SIGGreen) of the Association for Information Systems (AIS) has released a statement on environmental change, where members of SIGGreen are encouraged to "[u]ndertake appropriate solution-oriented research into environmental change issue of mitigation, reversal, and adaptation" (SIGGreen 2012). Green IS has received increasing attention at IS conferences (Brooks et al. 2012; Corbett 2010; Vazques et al. 2011; Kossahl et al. 2012) and also books in the field have been published, such as "Energy Informatics" by Watson and Boudreau (2011) and "Green Business Process Management. Towards the Sustainable Enterprise" by vom Brocke et al. (2012).

Nevertheless, Green IS as a research area is still emergent. Our discipline is challenged to seek answers to such fundamental questions as whether the design of Green IS is different to that of 'traditional' IS or what information needs to be transmitted, processed, and stored by Green IS (Seidel et al. 2013). In a recent call, fellow researchers have identified specific directives for the IS discipline predominantly important to provide solutions for the environmental problem, including both fields of research and principles of academic practicing (vom Brocke et al. 2013).

The two possible foci of Green IS – Green IS research within a solution-oriented or design science paradigm and Green IS research within a behavioral-science paradigm – are reflected in this special focus issue. First, Hendrik Hilpert, Johann Kranz, and Matthias Schumann present an IS system for greenhouse gas emission tracking in logistics. In their solution-oriented study, they derive design principles from the literature and develop a system that is intended to enable more environmentally sustainable practices in logistics. Their evaluation indicates that the use of their system provides more accurate and detailed information on emissions. The paper is thus an example for design-oriented research on Green IS. Second, Ingrid Gottschalk and Stefan Kirn investigate the role of cloud computing for creating more environmentally friendly business processes. Specifically, their study analyzes preconditions for accepting cloud computing as a green technology drawing on theory of reasoned action (TRA) and the technology acceptance model (TAM). Their study thus relates to a stream of research that investigates how existent technologies are re-interpreted and used in the context of environmental sustainability. The two papers are exemplars that show how solution-oriented research as well as behavioral research can provide valuable insights into how Green IS can contribute to the betterment of the natural environment.

Finally, this special focus issue presents an interview with Daniel Schmid, Head of Sustainability Operations of SAP, where it is suggested that becoming environmentally sustainable may not only contribute to a better environmental footprint, but also constitute a promising business approach. Mr Schmid highlights that sustainability is not only a very real need, but also a strong driver for innovation. To put it in the words of Anders Fogh Rasmussen, Former Prime Minister of Denmark: "Business as usual is dead – green growth is the answer to both our climate and economic problems." We hope that this special focus issue will contribute to our understanding of the role that IS play in creating more environmentally sustainable organizations and supply chains, and that it will stimulate more research in this important area.

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