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# The Status Quo and the Prospect of Green IT and Green IS: A Systematic Literature Review

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**Abstract**

The research on the relationship between environmental sustainability, Information Technology, and Information Systems under the terms of Green IT and Green IS has grown exponentially during the last five years specifically in IS research community. We have applied the systematic literature review to understand and summarize the existing research related to the field with the aim of understating better the research field, categorizing the studies and identifying some research opportunities and gaps for future research. Our systematic literature review highlighted the need of research in some topics. This review summarizes the state of available information related to Green IT and Green IS studies.

Keywords: Sustainability, Green, Information systems, Information technology, Green IT, Green IS, Systematic literature review

## 1. Introduction

There has been an increasing concern regarding environmental sustainability issues (Standing and Jackson, 2007), and recently has risen to "prominence as a solution to serious environmental and social problems"(Chen et al., 2008). Moreover, organizations and businesses are under an overwhelming pressure from their shareholders and legislatives to improve their environmental sustainability activities (Melville, 2010, Butler, 2011a, Murugesan, 2008). This concern regarding the environment and climate is creating an impetus and ever increasing momentum which sometimes is referred as Green Movement. One of most cited definitions of sustainability is the one presented in World Commission on Environment and Development in 1987 as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). A long-missing piece of the sustainability puzzle, ecological sustainability refers to ''the ability of one or more entities, either individually or collectively, to exist and thrive (either unchanged or in evolved forms) for lengthy timeframes, in such a manner that the existence and flourishing of other collectivities of entities is permitted at related levels and in related systems'' (Starik and Rands, 1995).

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 (Molla and Abareshi, 2012, Dedrick, 2010). So, making IT product, use, and disposal more environmental friendly and greener is referred as Green IT (Dedrick, 2010, Molla and Abareshi, 2012, Ryoo and Koo, 2013, Molla, 2013). The term Green IT "denotes all activities and efforts incorporating ecologically-friendly technologies and processes into the entire lifecycle of information and communication technology" (Hedwig et al., 2009). The second order effect refers to the positive impact of IT on the environment which considers IT as part of the solution. Hence, utilizing IT to make business processes and activities greener is known as IT for green or Green IS (Sarkis et al., 2013, Dedrick, 2010, Molla, 2013, Watson et al., 2010). As IS researchers, Brooks et al. (2012) defined Green IS in two ways: "as the initiatives to utilize IT infrastructure to change organizational processes and/or practices to improve energy efficiency and reduce the environmental impacts, and to introduce environmentally healthier products and/or services". Though, Green IT and Green IS are interrelated concepts, but they have their own focus and purposes.

Green IT and Green IS are emerging research areas in the field of Information Systems research. Accordingly, most of the IS related publications are about call for actions (e.g. Watson et al., 2010), introduction to the research and the teaching agendas (e.g. Sarkis et al., 2013, Dedrick, 2010), and a few studies focus on the adoption and diffusion (e.g. Bose and Luo, 2011, Butler, 2011a). However, there is no overview of the state of the art in