



Sustainability of Green IT: An exploratory research

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Green IT is defined in literature as a synonym to environmentally sound Information Technology. Green IT has invoked a widespread appeal owing to its noble cause to reduce the negative environmental impact of computing with the added benefit of its ability to reduce the unwanted costs associated with IT. However the level of Green IT adoption is very low, especially in the Indian organizations (Forrester & Fujitsu Reports-2010). Technologies in Green IT usually fade away in the disillusionment stage of the hype cycle, depriving it of the productivity stage thereby raising concern on their sustainability. A comprehensive literature review supplemented with the practitioner interviews (IT Managers) revealed a major issue with Green IT implementation- The Sustainability of Green IT initiatives in the long run.

The problem of sustaining Green IT initiatives led to the development of research questions addressed in this study: (1) What is Sustainability of Green IT? How to differentiate between organizations that are sustainers in Green IT initiatives from those that are not? (2a) What are the factors that contribute to the sustainability of the Green IT initiatives and discriminate between a group of Sustainers and Non-Sustainers? (2b) How do successful organizations implement the dominant factors contributing to sustainability of Green IT?

The research started with an empirical proof exhibiting the problem of Sustainability in Green IT initiatives by studying performance of top Green IT organizations (longitudinal) listed in Greenpeace database (worldwide). Results manifested that the problem was lucidly evident even in the top Green IT firms (only 2% of the firms scored consistently over 7 out of 10). The problem was further aggravated with the analysis of Computerworld Green IT rankings, where only 7% of the participating firms consistently featured in the top lists. Program sustainability literature also revealed that on an average, only 40% of the programs (social and health) sustained in the long run. Further, the purpose of evaluating program sustainability was restricted to the 'continuity' of the programs per se and did not include sustained performance. Therefore, this study addressed the broader aspects of program sustainability and conceptualized the same by addressing the first research question.

A framework for Sustainability of Green IT was developed to comprehend the underlying factors promoting sustainability. This framework was based on Resource Based View, Institutional Theory, extant literature on Program Sustainability and practitioner interviews. The factors in the framework represented three dimensions: a) Factors promoting culture of Sustainability b) Business Process (factors integrating Green IT with the business process) and c) Organizational Properties (Size, Technological Resources). Further, this study proposed a method for classification of a given set of organizations into Sustainers and Non-Sustainers. This involved assessment of environmental performance prior to implementation of Green IT in an organization and comparing it with the performance in the long run (used longitudinal carbon emissions data from Carbon Disclosure Project (CDP) and GRI database).

Multivariate Discriminant Analysis (MDA) was used to empirically investigate the proposed framework on Sustainability of Green IT and to discriminate between the two groups

(Sustainers and Non-Sustainers). Data for the study was collected from seventy six Indian IT firms that included both Computer/Electronic manufacturing and IT Services. A quantitative survey design was used and the scales were tested for reliability and validity.

Results revealed that the two dimensions of 'Factors promoting culture of Sustainability' and 'Business process factors' were the most relevant discriminators between the two groups. An interesting and counter-intuitive finding was that the Organizational properties did not play a significant role in contributing to Sustainability of Green IT initiatives. Further analysis added an interesting observation on non-sustainers (large firms) having low scores on culture dimension, thus highlighting the importance of factors promoting sustainable culture. The factors that turned out to be relevant from the analysis were studied under a practical firm level setting in the form of a qualitative Case study. This method involved Wipro & Cognizant, serving the purpose of complementarity in the mixed method research. These firms consistently featured in top Green IT rankings rated by several agencies and hence were chosen for the study.

This study makes a novel contribution to theory by developing a framework for Sustainability of Green IT. The significance of the research lies in the fact that it spans multiple areas including Program Sustainability, Green IT and Strategies in environmental initiatives. The management research on Green IT is at its infancy stage and thus this research would open up new dimensions in Green IT research. For the IT managers, this study helps develop acumen on evaluation of Green IT initiatives. Further, they can focus on important parameters (outcome of the study) to ensure the sustainability of Green IT initiatives. The framework could further be extended to assess the sustainability of programs in general.