

Reducing, Reusing and Recycling: A Framework for Green IT

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Abstract

The concept of 'sustainable development' has a futuristic significance. It has evolved from the vision of a group of environmentalists that worked on the benefits of economic development by addressing the environmental issues caused by external factors. According to R.R. Harmon and H. Demirkan, the growth and development of a business often result from the confluence of powerful forces such as social changes, technological innovation, war, globalization, government regulations, resource constraints, and other factors and events that disrupt markets and business models. The dynamics of the market trends must be understood by the management and quickly adapt to market changes to gain a competitive advantage. [15]

Green computing, green IT or ICT (information and Communication Technologies) Sustainability, is the study and practice of environmentally sustainable computing or IT. As defined by Murugesan, this can include "designing, manufacturing, using, and disposing of computers, servers, and associated subsystems—such as monitors, printers, storage devices, and networking and communications systems — efficiently and effectively with minimal or no impact on the environment" [5].

Two major problems have been identified with the increasing use of IT devices. Considering the short life span, energy consumption is significantly high especially if we consider the total life cycle of IT products and datacenters' power usage. Secondly, the discarded IT devices pose serious health and environmental hazard because of the presence of some toxic materials in electrical and electronic products (Hanne 2011). According to her, Green IT is mainly concerned with energy consumption, use of toxic substances and e-waste [7].

The concept of greener web browsing described by Bianzino, Raju, and Rossi (2011) is focused on power consumption of the Web from the end-user viewpoint, considering the variability of the websites, browsers, operating system, and hardware equipment. Because of several scripts running parallel in browser tabs, a potentially large source of power waste arises that needs to be addressed for absolute energy savings [8].

According to Murugesan and Laplante (2011), Green IT is also about the application of IT to create energy-efficient, environmentally sustainable business processes and practices. This way, the green IT companies can support, assist, and leverage environmental initiatives and help in creating greener, more sustainable environment while offering economic benefits [9]. Jain et al. (2011) presented an extended balanced scorecard approach that incorporates a new dimension for environmental and social sustainability perspectives. Using this new sustainable balanced scorecard, authors determine the organizational performance of recent green IT initiatives announced via press releases. Based on this analysis, they offer recommendations for top

management and IT professionals on harnessing green initiatives [6]. Exploring the Potential of Green IT, San Murugesan (2011) recommended embracing new business opportunities that leads to many questions among IT professionals and policy makers in both mature and emerging markets. Other researchers have proposed that innovations in technology, design, service delivery, and business models are needed for IT to make further inroads into the world's emerging markets and embrace the untapped potential [10].

Green Computing has been identified and defined as the first wave of sustainable efforts in minimizing the energy consumption for huge datacenters and technical equipment (such as desktops and projectors). However, the second wave of Sustainable IT is more externally focused on achieving corporate social responsibility as well as delivering on core IT performance requirements while meeting the business demands [16]. The central idea of Sustainable IT is to develop a sustainability-oriented organizational culture that pays attention to the social and environmental impacts of Information Technology products and equipment.

The purpose of this article is to provide a detailed review of existing literature in this growing field of green IT. A comprehensive framework for strategic implementation of green IT is also developed and will be presented. This framework will be validated by conducting structured interviews with senior IT leaders at two large firms in Pennsylvania, USA. Lastly, several mini case studies of successful Green IT implementations will be discussed, followed by managerial implications and conclusions.

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