Chapter 2
Green Information Technology and Virtualization in Corporate Environmental Management Information Systems

Edward T. Chen
University of Massachusetts Lowell, USA

ABSTRACT

Businesses today must not only be concerned with their day-to-day operations and the making of profit, but also with a set of challenges related to the public perception, the environment, and the costs of energy consumption. The image of the company from the perspective of customers and the public in general must be carefully monitored as it relates to the environment and the use of natural resources and energy. The demonstration of effective strategies that allow for "greener" and more ecological awareness, will gain the respect of customers, businesses, stockholders, and other concerned groups. The protection of our environment is also a major agenda of firms today. This paper discusses how "Green IT" along with the concepts of "Virtualization" can provide for better organizational, operational, and environmental outcomes.

INTRODUCTION

The large number of personal computers that are present in businesses and the high quantity of servers that are available twenty-four hours and seven days use tremendous amounts of energy and space. Strategic and tactical solutions can be put in place that can effectively reduce costs for organizations and allow for "greener" overall results (Boursas, Hegering & Hommel, 2009; Lee, Eom, Kim & Katerattanakul, 2007). Additionally, by using various Virtualization techniques for hardware, software, and systems, many daily operations can be made more efficient. Incorporation of various strategies can lead to new ways of conducting business such that higher cost savings and less environmental impact can be realized (Casazza, Greenfield & Shi, 2006; Ho, Au & Newton, 2003; Kroeker, 2009; Overby, 2008).

Organizations must always attempt to resolve financial, logistical and environmental issues in order to remain competitive and to be perceived

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superior in the industry and in the public eye. In order to be viable as an organization in this century, concerns for the environment must be considered (Raufflet, 2006). Failures to recognize or act upon these looming challenges will ultimately destroy companies and economies (Schäfer, 2005; Vandermerwe & Oliff, 1990). Creative tactics must be taken into account to strengthen the corporation as well as the world around it (Alexander, 1991; Beaumont, 1992; Brown, Dillard & Marshall, 2005). While organizations are exploring creative alternatives to save billions of dollars, they need to make our environment healthier and more stable (Collison, Lorraine & Power, 2003; Jain, 1984; Lewis, 2004; Pun, Hui, Lau, Law & Lewis, 2002; Walker, Pitt & Thakur, 2007).

WHAT IS GREEN IT

There has been much discussion over the past several years about our environment and the effects of global warming. Organizations such as Greenpeace and influential people such as Nobel-prize winner Al Gore and his documentary, "An Inconvenient Truth", have certainly put much focus on these topics (Alleven, 2008). Perhaps it is this awareness that has made each of us more conscious of the potential outcomes that may ensue if we continue to ignore our environment. This knowledge has moved from our own consciousness to the organizations in which we work. Green Information Technology (IT) is the term used to capture this awareness and to study the potential ways to solve the problems with pollution and consumption of vast amounts of energy in the computing world (Dignan & Perlow, 2007; Sliwa, 2008).

The concerns for economic viability, social responsibility and the effect on the environment are all encapsulated in this concept of Green IT. The outcome of developing solutions that can be more friendly to the environment and at the same time more economical for the corporation has led many to believe that the ultimate goals of an organization are simply to take advantage of the concept by exploiting and touting the concept of being "green" for marketing purposes and for the potential profit gains that could be realized. Although this argument may contain some truth, one should ask the following question. Is it not better that companies be concerned for the environment, whether it be for legitimate reasons or selfish reasons, so that the ultimate goals of society can be realized? A corporation has an obligation to both its shareholders and to the economic viability of society in general (Tiemstra, 2003). If the outcome of being "green" allows a company to be more profitable either by means of better efficiency or by better public relations, then so be it, as long as the ultimate worldly consequences are reduced (Brown, Dillard & Marshall, 2005; Collison, Lorraine & Power, 2003).

WHAT IS VIRTUALIZATION

The term "Virtualization" has multiple meanings depending on the context of the discussion, but it can be summarized as the creation of logical pools of IT resources not linked to physical devices (Scheier, 2007). When used in the context of servers, virtualization refers to the use of special software which allows systems administrators to install multiple operating systems on the same physical piece of hardware. When used in the context of desktops, it refers to the hosting of individual user sessions or desktop operating systems at a central location. When used in the context of storage, virtualization refers to the dissemination of data over a wide range of physical locations in an attempt to achieve optimized access across a large geographical area.

Virtualization, in a broad sense, is the simulation of a real physical entity. In the information technology field, this term is used to describe a means of hiding the physical characteristics and technical details of a system from the user (Casa-