

Chapter 48

Environmental Sustainability in the Computer Industry for Competitive Advantage

Nayem Rahman

Systems Science, Portland State University, USA

ABSTRACT

The computer industry is quite often blamed for excessive energy consumption, carbon emissions, and e-waste. Shipment of e-waste to developing countries where it is often disposed of in unsafe ways is another major issue. Implementation of an end-to-end computer and related products sustainability management strategy by incorporating the reuse of existing technology can make a major impact on the environment. Organizations can take sustainability programs as part of business strategies to achieve competitive advantage in the industry. This chapter discusses different aspects of a sustainable computer industry program and proposes that computer makers take ownership of disposing of e-waste by following safety standards. The chapter also proposes adopting a reverse supply chain process for possible reuse, recycle, or disposal of computers. The author also points out that adopting strategic sustainability initiatives can help an organization to achieve competitive advantage.

1. INTRODUCTION

The information technology (IT) industry accounts for approximately 2 percent of global carbon dioxide (CO₂) emissions (Gartner, Inc. 2007). About 75% of the ecological footprint comes from IT products usage and 25% constitute embodied carbon in IT products (The Climate Group, 2008). IT products include data centers, servers, personal computers (PCs), telecoms networks and devices, and printers. This paper limits the scope of this research to Personal Computers (PCs).

Research firm, Gartner, Inc. (2015) reported that worldwide combined shipments of devices (PCs, tablets, ultra-mobiles and mobile phones) for 2015 are estimated to reach 2.5 billion units, an increase of 3.9 percent over 2014. This projected number of computer device sold indicates how much energy would be consumed worldwide. This also references materials used to build these computer products. Energy

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consumption, carbon emissions (Ahuja & Muthiah, 2016), natural resources consumption and landfill of computers (after end of life) are the key concerns. Given the intensity of natural resources and energy consumption by computer products indicates the need for the computer industry to be environmentally sustainable. Sustainability initiative also needs to be attached to a company's business strategy.

The term sustainability has been defined in many different ways by different people, institutions and organizations. One widely accepted definition is from the Brundlandt Report, "sustainable development is the development that meets the needs of present without compromising the ability of future generations to meet their own needs" (World Commission on the Environment and Development, 1987). Sustainability is "a characteristic of a process or state that can be maintained at a certain level indefinitely" (Jabareen, 2008). The major driving force for sustainability is the public concern about the environmental impact of the present fossil fuel based energy system (Rahman and Akhter, 2010). We need to satisfy our needs by judiciously using renewable resources, recycling wastes, and reversing environmental degradation (Duan et al. 2009).

Sustainability starts from a sustainable design. Sustainability can and should be a central focus of interaction design (Blevins, 2007). A sustainable approach to design and engineering involves evaluating where a product or system has the greatest environmental impact and then prioritizing strategies which reduce that impact (Gaughran et al. 2007). Intelligent manufacturers must take into account all the indicators of energy demands and supply in planning their chain supply, and processing strategies. All these apply to computer products. Reduction of waste including energy waste shows not just corporate responsibility, but is also seen to make sound economic sense (Gaughran et al. 2007) and a means to achieve competitive advantage in the industry.

Nidumolu et al. (2009) assert that sustainability should be taken as one of the main drivers of innovation. Instituting sustainability starting from design (sustainable products and services) helps a company to be compliant with regulations enforced by countries in different regions. In fact forward looking companies take compliance as an opportunity to make their products follow regulations set by countries globally. They add sustainability to value chains – supply, operations, and returns (reuse returned products). All these can give a company an opportunity to use them as part of product promotion strategies.

Our research was based upon a few questions. Can the computer industry improve environmental sustainability to help contribute to a greener planet? Where do computers go after end of use? Are they recycled or hoarded or go to landfill? Can adoption of environmental sustainability measures provide competitive advantage? To answer to these questions, we did an extensive review of existing literature. We went through research and industry papers written by researchers, practitioners, and environmental sustainability advocacy group. Based on insights drawn from academy and industry papers we propose measures that needs to be adopted to achieve sustainability in terms of environmental, energy and material consumption. Nanath & Pillai (2017) suggest that green computing and innovations can be beneficial not only to environmental sustainability but also to attain competitive advantage. For a long-term survival in the industry a firm must achieve a competitive advantage (Rahman, 2017).

2. LITERATURE REVIEW

The computer industry is an important area from an environmental sustainability standpoint. Sustainability has been a research topic for more than three decades. The research is mostly related to ecological, economic and social aspects of sustainability. Organizations are able to stay competitive; reduce cost;

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