Chapter 13
A Framework for the Implementation of Eco-Efficient Business Systems

Maha Shakir
Zayed University, UAE

ABSTRACT

Environmental sustainability is an important issue for many individuals, businesses, and governments nowadays. One of the road blocks to sustainable practice is cost, which is an important consideration, particularly for business. The eco-efficiency movement was initiated to address this concern. This chapter reviews the eco-efficiency concept and explains why it is becoming a current issue for many organizations today. The chapter further aims to understand eco-efficient implementation strategies and methods, and the important role that information systems play in creating the required organizational capabilities for these implementations. A framework of eco-efficiency implementation is developed through mapping eco-efficiency strategies to different implementation methods. The framework illustrates how each method is suitable for a particular eco-efficiency strategy. With the understanding that information systems form an integral part of most eco-efficiency implementations, the role of information systems in creating eco-efficiency capabilities is highlighted to enrich the framework.

INTRODUCTION

Environmental sustainability has come to the forefront of issues that are important to individuals, governments, and businesses during the last ten years (Montiel, 2008). There now exists a shared understanding that the earth's resources have been over used during the last one hundred years, that these resources are finite, and that unless current generations proactively address this issue, future generations will suffer (Sutton, 2004). Technological advances supporting mass production in areas such as agriculture, manufacturing, mining, and tourism have greatly contributed to the depletion of the earth's resources. In societies that have encouraged consumerization, technology has been mainly used to exploit resources with little or no consideration of negative

environmental side effects (Nidumolu, Prahalad & Rangaswami, 2009). Development of technology has been geared to improving product quality, increasing efficiencies, and reducing production costs. This exploitation has become ingrained in common business practice. When environmental sustainability concerns have been raised, the costs of addressing these issues were often prohibitive, particularly in a competitive business environment. This has necessitated a fresh approach to looking at sustainability which is eco-efficiency. Eco-efficiency combines cost reductions with ecological friendliness as a key driver for sustainable development (Lehni, 2000). This presents a major mindset shift in business practice and hence presents key challenges that need to be well managed in order to attain the promised benefits.

Organizations develop different capabilities through the bundling and unbundling of different resources to carry out the tasks they were established to do. The resource based view of the firm posits that a resource is an asset which could be a strength or a weakness (Wernerfelt, 1984). These assets are physical, human, and organizational (Eisenhardt & Martin, 2000). Organizational capabilities cover areas such as human resources, financial, technology, processes, collaboration, etc. A mindset change to embrace eco-efficiency requires building organizational capabilities that support eco-efficient business practice. Information systems are one of the key capabilities to support these changes.

The objectives of this chapter are to:

- Understand the eco-efficiency concept and why eco-efficiency is now an issue for many organizations
- Outline and briefly review different eco-efficiency strategies
- Understand the key features of different types of corporate information systems (CIS)

- Outline and briefly review the different methods used to enact change in organizations
- Explore the role that CIS play in creating organizational capabilities for the implementation of eco-efficient business operations
- Develop a framework for eco-efficiency implementation by mapping eco-efficiency strategies to different implementation methods

The audience for this chapter is undergraduate students, practitioners, and academics. The expected area of study for undergraduate students would be in information systems (IS), information technology (IT), management information systems (MIS), or environmental sustainability. The practitioner audience is generic and is expected to be a mix of IT and non-IT professionals. For undergraduate students and practitioners, the chapter develops a foundation for understanding eco-efficiency and the role of different types of CIS in supporting eco-efficient business operations. For practitioners and academics, the chapter suggests a framework that relates different eco-efficiency strategies to organizational change management methods.

This chapter is structured as follows. The next section reviews the eco-efficiency concept, origins, and history. It also explains why eco-efficiency is an important issue for many organizations today and the roles of different stakeholders in promoting eco-efficient practices. The following section focuses on implementing eco-efficiency in businesses operations. It maps eco-efficiency strategies to different implementation methods, and describes the role that information systems play in creating the required organizational capabilities for eco-efficient business operations. Finally, challenges to the successful adoption of information systems are discussed along with some recommendations. The chapter ends with

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