

## Chapter 21

# Green, Sustainable, or Clean: What Type of IT/IS Technologies Will we Need in the Future?

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### ABSTRACT

*Since antiquity, human activity and technological innovations endanger environmental balance. Any new technology generates more business activity, leading to increased resource extraction and waste and directly menacing natural ecosystems. As a result, technological progress and economic growth are based on unsustainable practices. In the last few decades, ICT has accelerated and globalized business activity and many problems emerged as scarcity of natural resources, global warming, and population growth are only few of them. For less than 20 years, information technologies made the world smaller and smarter. ICT transformed all aspects of human life including business processes and practices, communication, logistics and transportation, learning, entertainment, commerce, and many others. The present research aims to outline some of the challenges to new technologies and IT/IS practices. It proposes a practice-oriented framework for adoption of green IT/IS strategy in companies. While literature is dominated by specific technological issues, businesses still miss the general vision of sustainable/green/clean technologies and how to adopt green IT/IS. Therefore, the discussion section of this chapter proposes an analysis of wider practices and initiatives leading to green IT/IS.*

### INTRODUCTION

Historically human progress and development of technologies have created a negative impact on environmental stability and integrity of ecosystems. For 10 millennia, technological innovations

transformed fundamentally the human life. Innovations gradually led to resource extinction, environmental exploitation and represent a global thread for the future. In the beginning of 21<sup>st</sup> century, people cannot even imagine the world without technologies. However in order to continue to benefit from technologies people have to make substantial changes in their current business

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practices and general perceptions. Recent global crises, combined with frequent natural disasters make planning of business operations unpredictable, markets - unstable and investments – riskier. In the same time, global economic activity has tripled in size since 1980, and is predicted to quintuple in the next 50 years.

The concepts of sustainable development have been defined 30 years ago. However, only recently businesses and social communities open the discussion for sustainable future. Do we still have a time to reverse the global trends? Some of the most urgent problem areas for businesses nowadays are: scarcity of natural resources and their rising prices; fuels, minerals, fresh water, energy; environmental factors – ecosystems integrity, waste management and global warming effects, increased number of natural cataclysms; social factors – cost of living, increased world population, aging society, mobility and migrations and others. More generally politicians, researchers and companies still miss holistic approach for coping with increased sustainability challenges. The high complexity of the term “sustainability” make possible different interpretations. Moreover, different contexts of applying sustainable concepts and tools lead to overall misunderstanding and perplexity.

Globalization and fast emergence of new technologies resulted in accelerated production and consumption models that provoked irreversible economic, social, and environment changes. New technology-based innovations formed the backbone of the recent economic growth, fuelling the market competition and catalyzing social and environmental footprints all around the globe. Information technologies transformed the logic of business operations and accelerated the globalization processes. Nowadays information technologies are practically involved in every aspect of human activity, including business, education, communication, entertainment and others. More specifically IT plays increasingly role in innovations and R&D processes, in cost-effectiveness

and efficiency, in customer services and finally have general impact on business competitiveness. Information technologies represent an unique expanding economy sector having large influence on overall economic activity.

Widely spread across businesses all over the world, usually IT/S can have very detrimental influence on organizational environmental footprint (Jenkins, 2010). ITs have short product life spans (e.g., laptops, 3–4 years; networks, 5–7 years); their manufacturing and disposal have resulted in toxic hotspots; and a large portion of organizations’ electricity costs (and concomitant greenhouse gas emissions) is due to IT energy use (e.g., office buildings, 26%; data centers, 95%) (Jenkins, 2010). In contrast to other technologies, information technologies and especially information systems have a large potential to reverse the negative impact. As discovered by Gartner (2007), ICT are responsible for about 2% of global carbon emissions. The main contributing sectors within the ICT industry include the energy requirements of PCs and monitors (40%), data centres, which contribute a further 23%, and fixed and mobile telecommunications that contribute 24% of the total emissions. However, the majority of researches cited by (Molla, 2008) believe in the potential of technologies to create sustainable business and society. It is estimated that ‘Green’ IT/S can have positive impact on the environment with the potential to reduce global emissions by 15% (The Climate Group, 2008). Even dominating corporate reports in the field of green IT/IS speculate that IT has a potential to create new competitive opportunities, to reduce carbon emissions, and to improve overall business efficiency (Molla, 2008).

The objective of the present chapter is to identify what are the current trends of green/sustainable and clean technologies (ICT) and to propose concise holistic framework for companies in order to enhance development and implementation of green IT technologies. Moreover, there will be discussed several practical aspects and examples.

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