Chapter 13
E-Competences for Organisational Sustainability Information Systems

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ABSTRACT

The present patterns of economic development are deemed to be ‘unsustainable’. It is believed that the concept of sustainability, assisted by the use of information and communication technologies (ICT) through organisational sustainability information systems (OSIS), is a ‘cure’ for current extraordinary environmental changes. However, the effective use of these systems requires an ICT competent (e-competent) workforce. E-competences, a combination of ICT-related knowledge, skills and attitudes are discussed in a number of studies but the European e-Competence Framework 3.0 is the only known framework that includes a single sustainability related e-competence. This study, however, reveals that, although the E-eCF3.0 sustainability e-competence is relevant, it is not sufficient for the effective use of OSIS as it transpired that the users should also possess other e-competences if these systems are to be exploited effectively.

INTRODUCTION

The present pattern of economic development, characterised by extraordinary environmental changes resulting inter alia from human economic activities, is deemed to be unsustainable as it escalates a number of complex societal and environmental problems (Holland, 2003; De Moor & Kleef, 2005; Gough, 2013). An alternative environment is advised that is supported by economic viability, healthy ecosystems and a more equitable social framework (e.g. UNDP, 1994; Holland, 2003; Elliot, 2007). Although this alternative thinking has its origin in the concept first explored at the UN Conference on the Human Environment in Stockholm (Sweden) in 1972, the sustainability idea gained prominence only in 1987 when the Brundtland Report defined sustainability as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p.8).

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This report alerted the to path of alternatives as opposed to the more confrontational discourse that existed between the proponents of economic development and those concerned with the environment.

The sustainability challenges are numerous: climate change, energy and water supply, biodiversity and land use, chemicals, toxics, and heavy metals, air pollution, waste management, ozone layer depletion, oceans and fisheries, deforestation (e.g. Esty & Winston, 2006, p. 33). Addressing them is a complex task but there are at least four main reasons for organisations to urgently attend to sustainability development (Epstein, 2008, pp. 21-22): (i) disregarding government and industry sustainability related codes of conduct can incur penalties and fines, legal costs, lost productivity due to additional inspections, potential closure of operations, and damage to corporate reputations; (ii) the consequences of poor sustainability performance and mismanagement of stakeholders can incur reputational damage and potential loss in market share as the general public and non-government organisations (NGOs) are increasingly advocating for adherence to sustainability issues; (iii) sustainability conducted business can create financial value by lowering costs (e.g. due to a decrease in regulatory fines) and increase revenue (e.g. due to improved corporate reputation); (iv) social and moral obligations towards communities in which businesses operate as corporations make a significant impact on society and the environment.

The complexity around sustainability development requires a holistic framework (Sachs, 2015) and the involvement of new methods and tools (De Moor & Kleef, 2005; UN, 2012). Information and communication technologies (ICT) are seen as such tools (Dompke et al. 2004; Yi and Thomas, 2007; Hilty, 2008) as these technologies “can change the behaviour of businesses and consumers, and through these changes, ICT can help the environment without scarifying economic output” (GIIC, 2008, p. 2). The development of the personal computer and the Internet are regarded as key milestones of the “sustainability revolution” (Edwards, 2005; Elliot, 2007; MacLean, Souter & Creech, 2012) as ICT and sustainability are “at long last” seen to belong together (Hilty, 2008, p. 9). Computers and information systems, for example, make it easier to: (i) track organisational resource use and productivity, (ii) benchmark across facilities, products, and production lines, and (iii) make a comparative analysis of raw material consumption, energy required, and waste generation (Esty & Winston, 2006, p. 109). Contemporary reports estimate the market for ICT for sustainability will tremendously increase. For example German SAP estimated in 2011 that the market for ‘sustainability software’ will reach $7 billion within five years (SAP, 2011) while the Verdantix report, focused on the US market, estimated that that sustainable business spend will grow from $34.6 billion in 2012 to $43.6 billion in 2017 (Verdantix, 2013).

However, the use of ICT for sustainability also has a downside as it has become one of the major contributors to environmental contamination throughout its lifecycle phases: production, use and in its disposal (Elliot, 2007). For example, e-waste from computers, televisions, telephones and other devices is one of the fastest growing problems in both developed and developing countries (Hasan, 2002; UNEP, 2005, pp. 17-18; Sarapuu, 2015). Increasing provision of ICT services which increases levels of energy consumption by ICT equipment can contribute to global warming, particularly if this energy is mostly produced by coal-burning power stations. To make the situation worse, it seems that the use of ICT in developed countries is a fait accompli, yet continues to operate outside an endurable sustainability framework. For example, some leading developed countries have refused to sign some important international sustainability-related documents such as the ‘Kyoto protocol’ (Kyoto, 1998). The use of ICT will continue to grow in both developed and developing countries and, if not used in the sustainability manner, might add to global ecological ruin.
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