

## Chapter 4.30

# The Relation Between ICT and Environmental Management Practice in a Construction Company

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### ABSTRACT

The aim of this chapter is to draw attention to the use of ICT in the building and construction industry with a special interest in the day-to-day activities of those companies that are working to develop more environmentally friendly and sustainable production processes. The chapter is based on a comprehensive survey of ICT use and attitudes to environmental related issues in middle and large sized construction companies in Sweden and two case studies: One of ICT use in a larger Swedish building and construction company and one of communication, coordination, and decision making processes in a construction project. Based on the empirical data we argue that in order to

enhance a more environmentally friendly building and construction industry there is a need for a more genuine cooperation and knowledge sharing between different actors both in crossing project boundaries as well as overriding contractual limitations. Decisions in a construction project must be taken earlier in the process and construction companies need to focus more on those processes over which they actually do have power.

### INTRODUCTION

This chapter will address some important contemporary challenges facing the construction industry related to the demands on the industry to become more sustainable. The scope of the problem is immense, encompassing wide-ranging challenges

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- from those at the level of national strategy to those, which concern the practice of individual organizations. In this chapter we will narrow the scope and focus on environmental management insofar as it is related to communication and information practice in construction companies. The centre of attention is the day-to-day activities of actors at different levels in the companies, whose decisions, supported by ICT systems, set environmental and sustainability visions and strategies into action. Although this is only one small part of the sustainability challenge in the industry, it is however, a very important one and – as we argue – it is a part of the process that previously has been given little or no attention. Even taking account of both environmental management in the construction sector as well as the sector's use of modern ICT, little of this effort has been noted, explored or questioned.

Over the last decade the construction industry has often been criticized for being slow when it comes to “renewal” (Ekstedt et al. 1992), lag-gard in adoption of new information technology (Mitropoulos et al. 1999), and also uninterested in attending to issues of sustainability (Femenias, 2004; Gluch, 2006). However, although the acceptance and adoption rate of ICT has been slow, a major increase in both the scope and depth of usage has been identified (Samuelson, 2001, 2002, 2008). Today, the use of ICT among large building and construction companies is an essential part of the coordination and management of information flows as well as supply chain management, planning, control, and cost estimation (Dainty et al. 2006; Molnár et al. 2007; Samuelson, 2008; Cutting-Decelle et al. 2007). Nevertheless, the use of ICT in regard to environmental management remains inadequate and also in need of further research.

According to Gluch (2000, 2006) environmental management systems in general are not used as an adequate support for environmental and “green” decisions. Moreover, it is claimed that there are large discrepancies between strate-

gies and practice when it comes to sustainability and green decisions (Gluch, 2006). Hence, it appears there is a gap between the use of ICT for coordination, communication and management of “general” information flows, and the use of ICT for coordinating and managing issues related to sustainability.

The aim of this chapter is therefore to draw attention to the use of ICT in the building and construction industry with a special interest in the day-to-day activities of those companies that are working to develop more environmentally friendly and sustainable production processes. In the chapter we will scrutinize both the line- and the project organization in order to identify, describe, and analyze communication and information flows, how sustainable decisions are made, and how ICT is used in relation to these activities.

## **SOME EMPIRICAL EVIDENCE FROM THE SWEDISH CONSTRUCTION SECTOR**

A vast variety of empirics from a comprehensive research project on *“ICT as a strategic resource for facilitating competitiveness and sustainability in the building and construction sector”* are used to support the discussion and analysis in this chapter. In this research project (executed from 2006 to early 2009) three main studies were conducted. The first study concerned ICT use and decision making related to sustainability. The data was collected via a survey in Swedish construction companies focusing on ICT use and formal decision-making structures. The aim of the study was to inquire how, where and by whom sustainability related decisions are made, and the possibilities for transferring the information and knowledge necessary for decision making among project actors via ICT solutions (see also Isaksson et al. 2009). The second study is a case study of a major Swedish construction company, which encompassed the entire organization, from

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