

# Chapter 12

## Organizational Effects of Information Technology: Investigating Information Technology Use in the Context of Lean Manufacturing

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### ABSTRACT

*The aim of this chapter is to better understand the enabling and inhibiting impacts IT has on lean manufacturing. This chapter provides a rich picture of a paper mill producing liner reels and the impact of a reel administration system on the manufacturing process. It is important that an IT tool supporting lean manufacturing reflects its organization. When it does the IT tool can act as an enabler of organizational change that in turn increase productivity and the production quality, when it fails to do so it inhibits organizational change and hampers the quality of production. The conclusion is that framing the definition of high production quality regarding product and process is important and that teambuilding would be a contribution to this end by enhancing perspective taking among the employees.*

### 1. INTRODUCTION

The topic and potential of information technology (IT) in organizations has been the subject of considerable interest and debate since Leavitt and Whisler (1958) first speculated on the organizational effects of new technology. The authors predicted radical changes – including the reorganization of middle-management levels, increased centralization, and “major psychological and social problems”

– occurring with the introduction of IT. Much of the existing literature has continued this trend of focusing on the outcomes and impacts associated with IT (Holmström & Stalder, 2001; Orlikowski, 1992; Robey & Holmström, 2001). Yet, despite high expectations and huge corporate investments, success remains elusive and IT failures remain a serious problem for practitioners and researchers (Sauer, 1999). Forty percent of all corporate IT projects are abandoned before completion (Griffith et al., 1999) and unused or underused systems cost

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businesses millions of dollars each year (Markus & Keil, 1994). The enormous potential of IT to transform the fundamental nature of organizations coupled with the high rate of IT failures raise important questions regarding its implementation within organizations.

While much previous research suggests that IT can be a critical enabler of firm performance (Bharadwaj, 2000; Hitt et al., 2002; Kumar, 2004; Sambamurthy et al., 2003) there is a lack of understanding of how IT investments can increase firm performance. This research extends the above stream of work by studying IT and its relation to manufacturing performance with a focus on the ways in which IT both enable and inhibit change processes. There is a pressing need to better understand the pathways through which IT investments lead to increased firm performances (Bardhan et al., 2006).

This paper describes the impacts of a specific product management system, the Reel Administration System (RAS) on the quality of production at SCA Packaging Obbola, a paper mill outside Umeå in the northern part of Sweden. SCA is the leading global supplier of customized protective packaging, and the mill in Obbola is producing liner. The aim of this paper is to better understand the enabling and inhibiting impacts IT has on lean manufacturing. By providing a rich picture of the environment for lean manufacturing at SCA Packaging Obbola AB the bottlenecks will be extracted and the quality innovation potential of the reel production explored.

The structure of the paper is as follows. In section two we discuss industrial information technology, quality, and impacts of information technology on organizations. In section the details of the case study at SCA Packaging Obbola AB is outlined along with methodical considerations made in the study. Section four contains an analysis of the findings from the case study and in the last section we conclude with the implications of our findings.

## **2. RELATED RESEARCH**

Information systems in industrial settings exist in a broad spectrum ranging from office software systems to systems that managing advanced robots. Software help managers with decision management and communication structures in today's factories are largely based on information technology. To make a social context in a manufacturing setting successful it is important that they understand other team member's situation in order to help them out. This requires a process of mutual perspective taking where distinctive individual knowledge is exchanged, evaluated, and integrated with that of others in the team (Boudreau & Holmström, 2006; Boland & Tenkasi, 1995). The team gets all the information they need about quality, productivity and logistics, which enhances quality of the process.

Information systems have a significant impact on organizations and it is vital that the system reflects its environment. If not, the cost of the system can turn out to be far more than expected (Orlikowski, 1993). With this in mind the value of IT investments in product management systems needs to be seen in relationship with investments in organizational capital. There is strong evidence that decentralized decision making, job training and business process restructuring have a major impact on returns to IT investments. The two complements each other and information system is an enabler of organizational changes that can lead to productivity gains (Dederick, 2003). That is to say management must look beyond conventional productivity measurement techniques to reap the benefit of productivity gains by information technology investment, which is the current understanding of IT investments (Brynjolfson, 1993). From a management perspective it is thus of importance to regard the need of the organization, or the specific the organizational unit, and make IT investments that reflects this need (Jonsson et al, 2008; Holmström & Robey, 2006).

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