Chapter 1
Industrial Informatics:
What We Know and What We Don't Know

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ABSTRACT

This book investigates information technology in the context of the process industry. When this context is examined, the implications of information technology go far beyond the contemporary accounts of IT in manufacturing processes – it also includes after-market sales, service production, sourcing, e-maintenance and so on. The sum effects of these changes are rapidly transforming the process industry.

INTRODUCTION

From a research perspective, the process industry is often characterized in terms that limit the scope of discussion to the actual manufacturing processes. This book broadens the scope to include the broad set of enablers that are transforming the industry into a service industry, and the interaction processes that are emerging in the process industries. We argue in this book that the role of information technology is profound in today's process industry and is likely to be even more profound in the future.

The history of the process industry has from the start been one of extensive use of technology. This was true long before the era of information technology – the mining industry, the pulp industry and the manufacturing industry have all co-evolved with technology. This has been the case with technologies of the past, and this is the case today with information technology. That is the reason why a broad view of the ongoing transformation in the process industry is necessary to understand the effects of information technology on an industry as large, diverse, and complex as the process industry. The contemporary developments on the Internet are likely to enhance the ongoing changes. To this point, they have not yet done so, and it is difficult to predict whether or how they will. Given these challenges facing the process industry this book sets out to explore information technology in the context of the process industry from an industrial informatics approach. This approach takes the recent

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reorientation of IT towards services, and IT as an interaction technology as points of departure to identify and explore new and innovative perspectives of process IT-use.

Industrial Informatics

For a couple of decades, in the 1970s and the 1980s, the industrial setting – and in particular the skills of the individual industrial worker – was at the core for Scandinavian informatics research. As industrial work as we knew it in the 70s and 80s has disappeared in Scandinavia, so has the industrial focus stepped back. As noted by Dahlbom:

"In less than 20 years we have definitely left industrial society for a service society getting more and more of its identity from the consumer market and less and less from the production factories of the 20th century. Indeed, we had left industrial society already in the 1980s, only that many of us […] for some reason did not want to acknowledge this." (Dahlbom, 2003, p. 31)

Today we must acknowledge that throwing out the industrial setting from the informatics agenda was like throwing out the baby with the bath water. While Dahlbom (1997) envisioned the "new informatics" as being all about dot com businesses there are many evidences now that informatics is more concerned with the industrial setting than with dotcom businesses. Clearly, in a service society focus is on services and their consumption rather than on goods and their production. But while services are provided to people and goods are mass-produced in factories, it was a mistake to believe that we left the industrial setting behind. In fact, after the dotcom businesses crumbled around 2000-2001 the Scandinavian industrial scene has become increasingly stronger.

To this end we seek to go back to the roots with this book – to both the ideas that traditionally have informed the Scandinavian informatics scene since its inception and the industrial base that is characteristic for the Scandinavian business scene. Today, we label the new informatics *industrial informatics*. Industrial informatics denotes the study of design, use and innovation of IT in industrial contexts. As such, it is not a field or discipline in and of itself. Rather, industrial informatics is building on the history of the informatics discipline, and focused and oriented towards the particularities and challenges characterizing IT in industrial contexts. It builds on a discourse on the design, use and innovation of IT as it is formulated in the informatics discipline (e.g. Hedman et al., 2005; Kling, 1999; Nilsson and Pettersson, 2000) with a particular emphasis on the industrial setting. Industrial informatics represents an engaged scholarship (Mathiassen & Nielsen, 2008) focusing on understanding and improving IT-related design-, use- and innovation processes. Industries pose a host of interesting challenges from an informatics point of view: A mix of leading and trailing edge legacy technologies interwoven in complex systems (Rönnbäck, Holmström and Hanseth, 2007); operators facing a complex interaction challenge when monitoring key industrial processes (Wiberg, 2005); boundary spanning practices in industrial settings (Jonsson, Holmström & Lyytinen, 2009) and industrial firms positioning themselves by moving from selling industrial products to offering industrial services (Jonsson, Westergren & Holmström, 2008).

Thus, we seek to bring perspectives and theories that have come to be the hallmark of Scandinavian IT research to an object of study that has been addressed largely from engineering and technologist perspectives.

The Umeå School of Informatics

As new information technologies are increasingly immersed in industrial settings new challenges and opportunities emerge. In this book we seek to identify and discuss these challenges and opportunities, and the book is a good illustration of leading research conducted in the realm of