

## Chapter VIII

# The Impacts of Information Technology on the Stock and Flow of a Firm's Intellectual Capital

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### **ABSTRACT**

*In this theoretical chapter, we examine the contribution of IT systems and tools to the emergence and use of different types of knowledge in a firm. We divide knowledge into explicit, tacit and potential and argue that these three types of knowledge characterize firms' three main functions - operational effectiveness, gradual development, and innovation, respectively. On the basis of our examination, we conclude that the main part of IT applications serves dissemination, storing and acquisition of explicit knowledge. However, there are also some tools that serve the elicitation of tacit and potential knowledge and the conversions between tacit and explicit knowledge. At the end of the chapter, we evaluate more generally the potential provided by IT. We argue that the addition of "a human touch" to the information produced and conveyed by IT is an emerging issue. We present two ways in which this can be done: the use of IT for the development of social capital in a firm, and the use of external experts—knowledge-intensive business services (KIBS)—as supporters in firms' knowledge functions linked to IT.*

## INTRODUCTION

The idea of the so-called knowledge society starts from the argument that in current and future economies the key resource is knowledge. At the beginning of the 1990s, it was considered important to reinforce the knowledge base and to invest in information infrastructures on both societal and organizational level. Towards the end of the decade and at the beginning of the new millennium, the processes of learning and innovation have been increasingly emphasized in addition to the stock of knowledge. (Lundvall, 1992, 1999; Schienstock & Hämäläinen, 2001) The essentially increased rate of change has brought to the fore the capability for rapid learning and production of new knowledge.

A corresponding shift of focus can be found in the knowledge management literature: knowledge was earlier analyzed mainly as an asset (e.g., Sveiby, 1990), but nowadays it is more and more often analyzed as a capability (Leonard-Barton, 1995; Teece et al., 1997; Eisenhardt & Martin, 2000). The type of knowledge to which the greatest attention has been paid also reflects the change. At the first stage of development of the discipline of knowledge management, explicit knowledge was the main focus of interest. Gradually the significance of tacit forms of knowledge was understood. The adoption of the concept of potential knowledge is the newest stage (Snowden, 2002).

The development of information technology (IT) has drastically facilitated and will further facilitate handling, storing and transferring of information. It has also provided new means that support learning: it has enabled more usable interfaces and specific problem-solving methodologies. These new means do not only provide firms with access to information dispersed in society, but they also enhance connectivity and receptivity in the economic system. Enhancing the connectivity means increasing of the shared learning experiences between and within firms. The promotion of receptivity is achieved by mak-

ing the absorption of external knowledge easier and faster, which increases the readiness of firms to use external knowledge sources (Antonelli, 1998, 1999).

Intellectual capital (IC) resources have been defined and categorized in many ways. The one thing that is common to all categorizations is that IC resources are intangible and consist of knowledge that has value to firms, that is, which the firms use to make profit. In this chapter we discuss the role of different kinds of IT tools in the accumulation and renewal of knowledge. As a background for our analysis we apply the idea that the competitive advantage of firms is formed by successful functioning in three different areas: (1) managing existing businesses effectively, (2) ensuring growth in these businesses and (3) developing new businesses. Together these areas represent what has been called the “fundamental management challenge of a firm” (Fitzroy & Hulbert, 2005, p. 266). Thus, a firm needs to handle concurrently the functions for (1) operational effectiveness, (2) gradual development, and (3) innovation (see also, Ståhle et al., 2003). We argue that in each area of activity a specific type of knowledge is crucial. In the area of operational effectiveness—which is usually linked to production-centered activities—explicit knowledge is especially important. In the developmental activities, tacit forms of knowledge and the conversions between tacit and explicit knowledge play a central role. In innovation activities, knowledge is still to a large extent in a potential, chaotic form; the task here is to bring order to this chaos and make some elements of the potential knowledge “existent.”

The main part of our analysis consists of the examination of the linkages of various IT tools to the above-mentioned types of knowledge: explicit, tacit, and potential. The purpose is to increase our understanding of the specific role of different kinds of IT tools from the viewpoint of knowledge management. We make a preliminary categorization between those tools that: (1) are

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