



Dealing with uncertainty in knowledge-intensive firms: the role of management control systems as knowledge integration mechanisms[☆]

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Abstract

Little research on knowledge-intensive firms has focused specifically on management control issues. This paper aims to consider such issues. Starting from the limitations of the definition of uncertainty, especially when applied to contexts characterised by knowledge intensity, this study investigates the relationship between knowledge complexity and management control systems. This relationship is analysed in the realm of knowledge-intensive firms' teams where it is particularly critical due to the double coordination and knowledge integration role played by management control systems. A field research conducted in three project teams of a software firm supports the relevance of knowledge complexity in explaining the variation of management control systems. The paper concludes with some avenues for future research.

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Introduction

The understanding of how a firm can manage knowledge is an issue that has received increasing attention in both theory and practice over the past ten years: on the one hand, we have seen the emergence of the knowledge-based theory of the firm, on the basis of which, knowledge and the capability to create and utilise such knowledge are the most important sources of competitive advantage (Prahalad & Hamel, 1990; Nelson,

1991; Henderson & Cockburn, 1994; Nonaka & Takeuchi, 1995; Boland & Tenkasi, 1995; Grant, 1996; Kogut & Zander, 1996; Nonaka et al., 2000); on the other hand, there has been an attempt to define knowledge-intensive firms and explain their organizational and management features (Bernardi & Warglien, 1989; Greenwood, Hinings, & Brown, 1990; Hinings, Brown, & Greenwood, 1991; Starbuck, 1992; Winch & Schneider, 1993; Alvesson, 1993, 1995, 2000; Nurmi, 1998). In general terms, knowledge-intensive firms refer to those firms that provide intangible solutions to customer problems by using mainly the knowledge of their individuals. Typical examples of these companies are law and accounting firms, management, engineering and computer consultancy organizations, and research centres. The category overlaps with

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the concept of professional service firms, but is broader, and does not focus on the features ascribed to a typical profession, such as a code of ethics, a strong professional association, monopolization of a particular market through the regulation of entry and so on (Raelin, 1985). In this paper I will discuss some central aspects of the management control systems¹ of this kind of organizations. To date contributions on both knowledge-intensive firms and management control systems have almost completely neglected this issue.

The literature on knowledge-intensive firms has focused mainly on the reasons for, and consequences of, the distinctiveness of this type of firms from other kinds of organizations and has mostly devoted its attention to the more obtrusive mechanisms of management such as the professional control of tasks, culturally based forms of co-ordination, and ideological modes of control (e.g. Smigel, 1963; Hall, 1968; Alvesson, 1993, 1995; Abernethy and Stoelwinder, 1995; Cooper et al., 1996; Dirsmith et al., 1997; Montagna, 1968; Morris & Empson, 1998). Management control mechanisms have not been explicitly addressed in the relevant contributions on the topic (Alvesson, 1995) or even have been considered, under certain conditions, counterproductive (Raelin, 1985; Nelson, 1988; Van Maanen & Kunda, 1989; Winch & Schneider, 1993; Alvesson, 1993).

Much of the management control thinking has concentrated its attention on the specifics of control systems design in manufacturing settings, where the activities are considered to be well suited to the use of such mechanisms. Only recently, has some attention been devoted to understanding their role in other contexts where the tasks differ

substantially from the physical production of goods and are likely to include some tasks which are relatively extreme in terms of task uncertainty, as in knowledge-intensive firms. Some instances of the contributions included in this stream of research refer to the design of control systems in research and development organizational units (Abernethy & Brownell, 1997; Birnberg, 1988; Brownell, 1985; Hayes, 1977; Kamm, 1980; Rockness & Shields, 1984, 1988)² and the use of these mechanisms in product innovation projects (Koga & Davila, 1998; Nixon, 1998; Davila, 2000).³ Yet,

² The studies on research and development mainly suggest that management control systems constrain or are irrelevant in R&D settings. Some contributions focus on how R&D departments use accounting controls (Hayes, 1977; Brownell, 1985; Rockness & Shields, 1988) and show that financial indicators do not assume specific relevance in these departments other than signalling the commitment of the organization to its R&D efforts. Other contributions, by adopting a wider definition of control systems, find only limited relationships between them and project characteristics. For example, Abernethy and Brownell (1997) demonstrate that “reliance on accounting controls has significant positive effects on performance only where task uncertainty is lowest” while “behavior controls appear to contribute to performance in no situation” (p. 245). This evidence seems to suggest that management control systems have a minor role to play in contexts characterised by a high level of uncertainty (Hirst, 1983; Brownell & Hirst, 1986; Brownell & Dunk, 1991).

³ The literature on product development suggests that when management control systems provide information directed to coordination and learning, they affect performance in a positive way (Koga & Davila, 1998; Nixon, 1998). But alternative arguments and evidence (Eisenhardt & Tabrizi, 1995) propose that such a relationship does not exist or is negative. Management control systems, by imposing rules and constraints on behaviour, reduce the level of creativity necessary to develop new products and, thus, negatively affect performance (Ama-bile, 1998; Davila, 2000). These arguments are in line with the traditional view of product development, according to which, successful new products derive from avoiding control procedures that could restrict the level of freedom available to researchers (Lothian, 1984; McNair & Leibfried, 1992). The effect of the use of management control systems on product development performance is, therefore, unclear. So far, only Davila (2000) has tried to explain this lack of clarity by suggesting that these contradictory results might be the result of a different interpretation of the role of management control systems that should be considered as information tools to face uncertainty rather than control mechanisms to reduce goal divergence (Hirst, 1983; Brownell & Hirst, 1986; Brownell & Dunk, 1991; Hartman, 2000).

¹ The definition of management control systems has evolved over the years from one focusing on the provision of more formal, financially quantifiable information to assist managerial decision making to one that embraces a much broader scope of information (Chenhall, 2003). Here, the term management control systems is used to name the design as well as the use of coordination mechanisms based on the standardization of either input, action or results (Thompson, 1967; Mintzberg, 1979, 1983). In this way we follow Merchant (1985), according to whom, the array of controls available for coordinating and controlling tasks spans from the use of result, to action and personnel/cultural controls.

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