

# Exploring the Role of IS in Dynamic Capabilities

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## ABSTRACT

*Resource-based theory suggests that firms develop idiosyncratic capabilities that contribute to sustainable competitive advantage when they are valuable, rare, inimitable and non-substitutable. The successful use of information systems (IS) and information technology (IT) has been linked to improved firm performance. Recent literature suggests that a deeper understanding of what capability means in practice may be gained from a disaggregation into component competences and resources. A better understanding of the role of IS/IT in business level capability may be achieved through a fuller articulation, both of the capability itself, and the contribution of IS/IT, together with an evaluation of the effectiveness in delivering sustainable competitive advantage. A dynamic capabilities perspective explains the way firms adapt capabilities to changing market environments over time. This paper explores these propositions through an exploratory case study using a framework derived from a resource-based and systemic view of the firm. The analysis suggests a dynamic Capability Development Model through which the implications and potential for IS and IT over time may be understood. The paper addresses three issues. First, it offers a better articulation of what capability concepts mean in practice. Second, it takes a disaggregated understanding of capabilities, and third, it sheds light on the dynamics of capabilities.*

*Keywords: Competences, IS, IT, Organisational Capabilities, Resource-Based Theory*

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## INTRODUCTION

The resourced-based view of the firm (Barney, 1991; Grant, 1991; Wernerfelt, 1984) offers a way to explain how organisations develop and sustain competitive advantage. In addition to the industry and market positioning perspective (Porter, 1980; Porter & Millar, 1985), intra-organizational considerations have now become

more important. Organisations compete for, and acquire, resources which they configure with a view to pursuing chosen strategic options (Sanchez, Heene, & Thomas, 1996). These idiosyncratic configurations result in differing responses to changing market environments (Leonard-Barton, 1992). These responses are effected through exercising organisational capabilities which bestow relative competitive advantage on competing firms (Sanchez & Heene, 1997; Teece, Pisano, & Shuen, 1997).

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As a potential strategic resource, organisational information systems (IS) and information technology (IT) are important factors in any resource-based perspective on a firm's competitive position. Much IS research has investigated the correlation between IS/IT investment and firm performance (Bharadwaj, 2000; Mata, Fuerst, & Barney, 1995), and which organizational IS/IT capabilities support the successful application of IS/IT (Feeney & Willcocks, 1998; Peppard, Lambert, & Edwards, 2000). There has been limited exploration of the relationship between business-level organisational capabilities and IS/IT (Caldeira & Ward, 2003; Teo & Ranganathan, 2003).

This paper elaborates an approach to modelling strategic capabilities that investigates the role of IS/IT and its value to the firm (Duhan, 2007). The paper sets out the resourced-based theory underpinning the approach and then considers its interpretation within an IS context. Using this analysis, a framework for the deconstruction of capability is then outlined. This framework allows the contribution of IS/IT to be assessed, together with an overall evaluation of the capability's impact on competitive advantage. The paper seeks to shed light on three issues. First, there is limited articulation of what the capability concepts might mean in practice. Second, the literature now argues for a disaggregated or process level understanding of capabilities, and third, the dynamics of capabilities are under-explored.

A single case study is employed, focusing on the typesetting capability of JournalCo, a firm specialising in content preparation for scientific, technical and medical academic journals. Data gathered over a two-year period are used to explore the value of the framework in explaining the contribution of IS/IT to organisational capability and evaluating the impact on sustainable competitive advantage. The discussion reviews the framework's value in this analysis, and proposes a temporal model of capability development as a strategic response to a changing environment.

## RESOURCE-BASED VIEW AND STRATEGIC MANAGEMENT

In the resource-based view of the firm, competitive advantage derives from the acquisition of resources and their deployment through organisational capabilities to bring about desired strategic outcomes (Andreu & Ciborra, 1996; Grant, 1991; Wernerfelt, 1984). These capabilities develop in idiosyncratic and path-dependent ways (Leonard-Barton, 1992) and consequently are difficult to transfer between firms. Typical examples of capabilities are Sony's competence in miniaturisation of consumer electronics (Prahalad & Hamel, 1990), Caterpillar's after-sales support and service (Javidan, 1998) and competence in materials (Rangone, 1999). This '*resource heterogeneity*' and '*resource immobility*' results in some firms being more competitive than others in a given industry (Collis & Montgomery, 1995; Mata et al., 1995). The sustainability of competitive advantage is dictated by the extent to which the firm's resources are found to be a valuable, rare, inimitable, and non-substitutable (VRIN) (Barney, 1991; Javidan, 1998; Rangone, 1999). Ashurst et al. (2008) state that '*while resources are clearly a critical element of the RBV, there is growing recognition that resources, per se, do not create value. Rather, value is created by an organisation's ability to mobilise, marshal, and utilize these resources through the application of capabilities and competences*' (p. 354).

The exploitation of these resources through organisational routines has been described through the terminologies of *competence* and *capability*. This paper regards a '*competence*' as the development of internal practice focused on a narrow area of resource, often a specific technology or a specific task (McGrath, Macmillan, & Venkataraman, 1995). In contrast, a '*capability*' is an aggregation of competences which, when suitably co-ordinated and deployed, may be exercised in an external market environment. Thus, capability is a higher level concept than competence, and it is through the exercise of

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