

The impact of a company's business strategy on its technological competence, network competence and innovation success

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Abstract

This paper discusses the dual nature of the key to competitiveness in the network economy: On the one hand, a company needs technological competence in order to add value to products and processes. On the other hand, companies need to develop network competence in order to link their organization to other players in the market to allow interactions beyond organizational boundaries. In this paper, a basic framework for the successful implementation of a technology-oriented business strategy is developed, consisting of four elements: business strategy, network competence, technological competence and innovation success. The model is empirically tested using a database of 308 German companies. The results show that both network competence and technological competence have a significant positive impact on a company's innovation success. Furthermore, the results suggest that a company's technological strategy supports the development of both network and technological competencies.

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1. Introduction

The explanation of firms' innovation success has a long research tradition and has lately received renewed attention due to increasing innovation costs, decreasing innovation times and increasing technology complexity. Researchers can be roughly divided into two camps: One group is looking into the internal success factors of innovations by, for example, analyzing the innovation process, corporate culture, cross-functional teams and technological competence (Brown and Eisenhardt, 1995; Cooper, 1997; Cooper and Kleinschmidt, 1995). The other set of explanatory variables is found on the boundary of the organization, and in its network, by analyzing a firm's interaction with other organizations. This group of researchers is examining innovations as the result of interorganizational collaborations between various companies (Biemans, 1992; Czepiel, 1975; DeBresson and Amesse, 1991; Gemünden et al., 1999; Håkansson, 1987, 1989; von Hippel, 1988). The innovation process can involve collaboration with many different types of partners, each offering significant resources. Fig. 1 illustrates how the innovating

firm can be embedded in an innovation network of cooperating partners (adopted from Gemünden et al., 1992). In a nutshell, research results indicate that an early (Handfield et al., 1999; LaBahn and Krapfel, 2000; Mabert et al., 1992) and intensive collaboration (Clark and Fujimoto, 1991; Heydebreck, 1996; Langerak et al., 1999; Wasti and Liker, 1977) leads to shorter innovation processes, reduced innovation costs and higher innovative output. Thus, innovation development has to be seen and understood in a wider context than that of a single company, one that has been called a company's technological interweavement or innovation network (Gemünden and Heydebreck, 1994; Heydebreck, 1996). The impact of collaboration on innovation success varies in the different innovation stages (Gruner and Homburg, 2000) and for different innovation aims (Gemünden et al., 1996).

Given these two areas for improvements in innovation success, we need to analyze the underlying competencies on which their impact is based. In addition, we also need to understand the relative importance of these two different arenas. In this paper, therefore, we analyse two different competencies: one describing the inside view and one describing the outside view. Furthermore, we look into the notion of technology-oriented strategy as a driving force of both competence development and innovation success (for a discussion of competencies, see Heene and Sanchez, 1997).

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The paper addresses two main research questions: Which competencies does a company need in order to achieve innovation success? What role does a company's business strategy play in competence development and innovation success?

The paper is organized as follows: First, we develop a basic model describing the impact of technological and network competencies on a company's innovation success. We then incorporate business strategy in our model. Subsequently, the results of an empirical test of the model are discussed. Finally, we outline managerial implications and issues for further research.

2. Theory and hypotheses

2.1. A company's competencies and their impact on innovation success

The term "core competence" was introduced into management studies by Prahalad and Hamel (1990), though the discussion of a firm's competence has a longer tradition (for a historical overview, see Carlsson and Eliasson, 1991; Eliasson, 1990; Rasche and Wolfrum, 1994; Winter, 1987). The concept takes a starting point in the resource-based view of competition, which explains a company's success in terms of its (internal) competencies.

Competence is often understood as a series of processes or activities (Day, 1994; Li and Calantone, 1998; Prahalad and Hamel, 1990). Alternatively, competence can be defined as a potential, or qualification, to perform activities, i.e. "having the ability, power, authority, skill, knowledge, etc., to do what is needed" (The New Oxford Dictionary of English, 1998). In this paper, the term competence is used to mean not only *having* knowledge or possessing skills and qualifications, but also *using* those qualifications. Thus, competence becomes a two-dimensional construct. Possessing qualifications but not using them, or performing tasks without having the appropriate qualifications, results in incompetence (cf. Gemünden and Ritter, 1997, pp. 297).

Competence can be measured in two ways: In terms of the degree of task performance and qualifications (the inside view) or, because competencies cannot be observed from the outside (Day, 1994; Prahalad and Hamel, 1990), it can be evaluated in relation to competitors, i.e. a company's competence in a particular field is seen as greater or less than its competitors'.

Several studies have looked at the content or types of competency (e.g. Malerba and Marengo, 1995). While the focus has traditionally been on *technological* competencies and their impact on innovation and corporate success, recent studies have taken a broader view by also including *managerial* competencies (cf. Carlsson and Eliasson, 1991; Dosi and Teece, 1993; Malerba and Marengo, 1995; Sanchez and Heene, 1997). Based on the foregoing discussion, two types

of internal competency are of particular interest for innovation success: technological competence and a marketing or network competence, which allows a firm to develop and use its innovation network.

2.1.1. Network competence

Traditionally, research into marketing competencies has focused on a company's ability to attract customers and sell them products and services. As a rule, authors do not consider customers' contribution to product and process innovation. Nor do they consider technological knowledge and information provided by *other* partners, particularly by suppliers, research institutions and partners in systems selling. Moreover, the specific capabilities involved in managing a network of *innovation* partners are not addressed either. In terms of achieving innovation success, the foregoing discussion on the network nature of innovation management suggests that we need to take a broader network perspective.

Of particular relevance to a company's innovation success is its ability to develop and use technology-oriented interorganizational relationships to link the company's (technological) competencies with those of its partners in the innovation network. Ritter (1998) has developed a concept of a company's network competence, which captures the level of network management task performance and the network management qualifications possessed by the people handling a company's relationships. This concept extends earlier notions of marketing competencies, because it highlights the interactions by which firms acquire information, exchange offerings and collaborate technologically. This view also takes account of the fact that interorganizational relationships have specific problems (e.g. opportunistic behavior, asset specificity, cf. Williamson, 1979), especially as relationships are investment processes, which include sunk costs. This underlines the need for a firm to develop a competence in managing its network.

Network competence enables a company to establish and use relationships with other organizations. This results in a high degree of technological interweavement, which is, in turn, a major contributing factor to innovation success (Biemans, 1992; Gemünden et al., 1996; Heydebreck, 1996). Furthermore, companies with a high level of network competence follow more realistic and more market-oriented innovation development paths and establish a better relationship marketing strategy for selling innovative products (Ritter, 1998; Ritter and Gemünden, *in press*). In addition, network-competent companies can be assumed to have a greater level of market knowledge competence in, which, in turn, contributes to innovation success (Li and Calantone, 1998). This leads to our first hypothesis:

Hypothesis 1: The degree of a company's innovation success is positively correlated with its level of network competence.

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