



# Application capability of e-business and enterprise competitiveness: A case study of the iron and steel industry in China

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## A B S T R A C T

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With the aim of identifying a mechanism that enables e-business technology to improve enterprise competitiveness, the authors conducted a case study of three large iron and steel manufacturing enterprises in China. This paper proposes the concept of application capability of e-business from a process-oriented perspective, and investigates the impact of the application capability of e-business on the relationship between e-business resources and enterprise competitiveness. The results show that e-business resources are necessary, rather than sufficient, to enhance enterprise competitiveness. We also found that an enterprise can use e-business technology to significantly enhance its competitiveness only when its e-business resources and application capability of e-business (particularly the core application capability) are efficiently and effectively synthesized. We conclude that differences in the enterprise application capability of an e-business eventually determine the effectiveness of an e-business technology.

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## 1. Introduction

The strategic use of e-business technology helped enterprises to gain competitive advantage in today's Internet economy, thereby enhancing enterprise competitiveness. Therefore, more and more enterprises are investing considerable resources in e-business technology in order to improve enterprise competitiveness by deploying internal value chain and external supply chain e-business activities. However, the gap between spending on IT—particularly on Internet-related technologies—and a widespread perception about the lack of value from e-business, has triggered a wave of debate about the "IT value paradox" [1]. Thus researchers should seek explanations for a phenomenon related to e-business practice: why do some enterprises with rich e-business resources see their e-business fail, for example, eToys, Boo.com, Chemdex.com, and Verticalnet.com? Among successful enterprises, why do some use e-business technology only to raise productivity and economic performance, while others significantly improve their enterprise competitiveness, e.g., Cisco, GE, Dell, eBay, and Google?

Previous research—whether an IT resources-based view (RBV) [2–4] or an IT process-oriented perspective [5]—tried to answer these questions but failed to provide reasonable explanations. Identifying answers to these questions will in large part determine the effectiveness of an e-business technology. Combining the RBV and IT process-oriented perspective, this study suggests that improved organizational performance through the use of e-business technology ultimately depends on creatively exploiting the application capability of e-business to build and use e-business systems. We selected three large iron and steel manufacturing firms in China, then undertook an exploratory case study to investigate the impact of the application capability of e-business on the relationship between e-business resources and enterprise competitiveness.

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## 2. Theory development

Traditional enterprises' investment in e-business has become more rational because of the failure of numerous Internet companies. To ensure the success of an e-business, managers must decide *how* to participate in e-business rather than *whether* to participate, and scholars have undertaken considerable research on this issue. Previous studies can be roughly divided into two categories: (1) those that investigate the impact of e-business capability on the relationships between e-business technology investment and organizational performance [2–4]; or (2) those that investigate the impact of intermediate variables influenced by IT on the conversion process between e-business technology investments and organizational performance, by using previous research on the application of IT in an enterprise [5].

Two problems arise with these studies, which hamper a better understanding of the internal mechanisms for using e-business technology to enhance enterprise competitiveness. First, e-business capability based on different perspectives lacks hierarchies, which is unfavorable to identifying and managing key processes and capabilities needed to enhance competitiveness. Second, these studies are concerned with different aspects of the value creation process of e-business technology, which does not help us understand all the capabilities needed to improve competitiveness. Therefore, a useful analysis framework should combine both types of studies, which will then reveal integral intermediate processes linking e-business technology investment to organizational performance, and will also identify capabilities that are necessary to ensure that these processes and activities can be completed efficiently and effectively.

### 2.1. Definition and model

Based on a study by Soh and Markus [6], we found three key activities that enable firms to use e-business technology to enhance their competitiveness: (1) making appropriate investments in e-business technology, (2) transferring these investments to successful e-business systems, and (3) using these systems to support competitive strategies [7]. This will enable the firm to achieve sustainable competitive advantage (see Fig. 1). Therefore, whether e-business resources can be transferred to e-business technology support for business strategy or/and supply chain strategy largely depends on the capability to build and use e-business systems; this is what we call “application capability of e-business.” We define the application capability of e-business as the organizational ability to help a firm build and use e-business resources to provide IT support for corporate strategies that enhance competitiveness. More importantly, application capability of e-business is significantly different from e-business competence examined in existing IS literature. Some researchers argued that some critical e-business competences, including dimensions of an e-business system itself and its support for business operation, are sufficient and necessary for an enterprise to enhance its competitiveness by a strategic use of e-business technology [3,4,10]. However, e-business competences can not be developed and formed by themselves, and should be constantly adapted to dynamic competitive environment. In this sense, the role of application capability of e-business are to build and use e-business resources to develop e-business competence, and to keep e-business competence dynamic and adaptive. Fig. 1 also shows that the relationship between the application capability of e-business and a firm's competitiveness is interactive. The impact of the application capability of e-business on business strategy, or supply chain strategy, and competitiveness

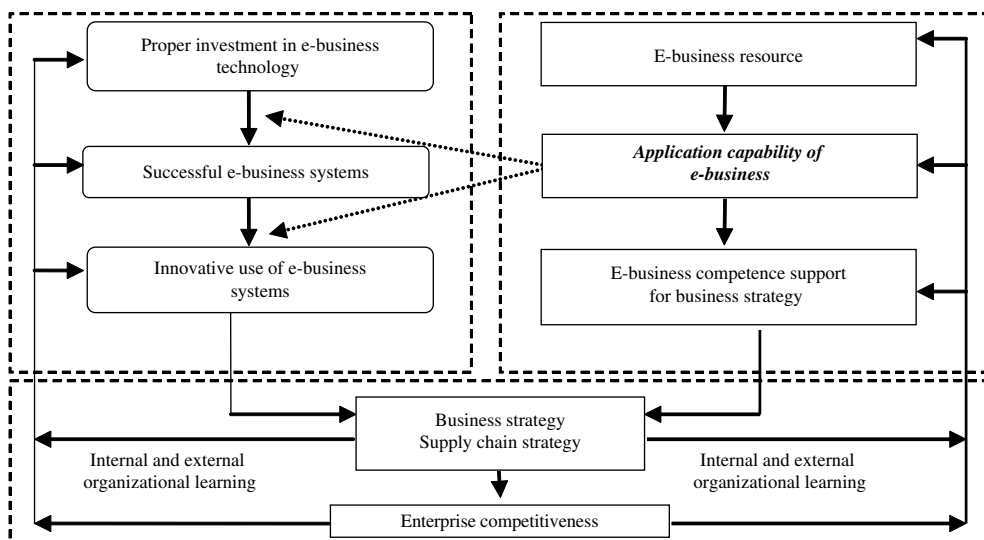


Fig. 1. A process model of application capability of e-business.

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