



The synergistic effects of IT-enabled resources on organizational capabilities and firm performance

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ARTICLE INFO

Article history:

Received 26 April 2010

Received in revised form 30 July 2011

Accepted 22 January 2012

Available online 10 March 2012

Keywords:

IT value

IT resource synergy

Organizational capability

Resource based view of the firm

ABSTRACT

Computing the value of IT investments and clarifying how the portfolio of IT/IS resources affect a firm's performance and sustainable competitive advantage are critical issues today. We attempted to develop an effective measurement technique and use organizational theory to discover the strategic role of IT-enabled resources in the firm's competitive agenda. Based on a resource-based view of the firm, we proposed a way to evaluate the synergistic effect of such resources on the firm's capabilities, as they, influence the firms' strategic objectives and improve its financial performance. The technological, human, and organizational resources work together to generate sub-additive cost and super-additive value synergies. Operations, R&D, and marketing capabilities allow firms to implement a business strategy that reflects its customer needs. A survey was conducted to check our framework. Our findings should provide valuable decision guides for practitioners when choosing a portfolio of IT/IS resources for implementing business strategies.

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1. Introduction

Investment in IT resources has long been assumed to be essential in providing competitive advantage by implementing the firm's business strategies [17,19]. IT innovations used in the automation and reengineering of organizational processes have reformed customer-centric services and reduced cost, etc.

From a resource-based view (RBV), the firm can sustain its competitive advantages if it possesses valuable, rare, non-substitutable, and inimitable resources [25]. Nowadays, packaged applications or back-office suites are available in the open market. Such commodities are easy to adapt in the firm without much, if any, rework. However many have asked whether IT commodities can provide sustainable competitive advantage because they are easy to replicate in a competing firm. Even worse, firms may overspend if the resource is neither rare nor highly relevant to strategic advantage.

This point of view ignores the fact IT innovations may be fundamental drivers of organizational transformation for successful business outcomes [5]. Hence, the evaluation of IT should focus on the planning, execution, and management of all investments. Accordingly, a firm should (1) ensure that IT investments meet the strategic objectives of the new business model; (2) be innovative by continuously reviewing a firm's dynamic capabilities to cope with the transformation of industry; and (3) tightly interact IT resources with others to maximize the

overall value. Thus, the IT business value model must compute the value that the impact has on the organization' bottom line [12].

However, many questions remain and need to be answered:

- (1) When IT-dependent and complementary organizational resources are deployed in the business, how does the synergy between the resources affect organizational transformation?
- (2) How is a general intermediate web formed to improve the financial performance of the organization?
- (3) How can the firm examine and link dominant dynamic capabilities to fit the firm's sustainable strategic objectives and financial performance without producing causal ambiguity and social complexity [20]?

Accordingly, we hoped to develop a model for exploring the underlying mechanisms linking the synergistic effects of IT-enabled resources to organizational capabilities and firm performance. IT resources and complementary organizational resources are its first-tier factors. They also act as primary inputs in increasing organizational capabilities which help to create and deliver customer and shareholder value.

2. The research model

2.1. Strategic objectives and financial performance

Continuously improving financial performance (measured as a rate of a firm's ROI) and producing above-average economic rents are generally the goals of profit-seeking enterprises. Thus, a firm

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should either introduce productivity strategies to boost financial outcomes, or adopt revenue-growth strategies to enhance profitability.

Firms adopting a productivity strategy are usually sensitive to changes in their competitors' positions. They need to reexamine organizational structure, routines, tasks, and resource utilization periodically and actuate organizational change schemes, e.g. TQM and BPR. These make productivity a short-term competitor-oriented strategy because a firm's capability in operations is usually not sustainable.

In contrast, a revenue-growth strategy focuses on long-term sales and profit growth by increasing revenue and improving profitability. This strategy tends to focus externally, stressing a need to be aware of the market and change to consumer needs; it can be viewed as a long-term customer-oriented strategy, because firm-specific capabilities in product leadership and customer care are valuable, rare, non-substitutable, and thus inimitable.

Developing a business strategy should include differentiating customer value propositions that become strategic objectives of the firm [7]. Firms have to excel at the favorite disciplines while meeting threshold standards in the others. Operational excellence involves a set of strategic approaches that produce and deliver goods and services efficiently and flexibly. The firm should improve its productivity and obtain financial benefits from cost savings [16]. Product leadership is achieved when a firm continuously offers leading-edge products or services with great functionality, availability, quality and lower prices. A firm with product leadership will gain competitive advantages and achieve greater revenue-growth through differentiating its products or services from those of competitors. Based on these concepts, we posited that:

H1. The achievement of strategic objectives has a positive impact on financial performance.

2.2. Organizational capabilities

To gain sustainable competitive advantages and retain long-term survival, a firm needs to develop its controllable organizational resources and capabilities to satisfy the RBV of the firm. From this view of the firm, organizational capabilities enable a firm to sustain its competitive advantage as their development is best protected by isolating mechanisms such as socially complex, path-dependent, and unique historical conditions. Organizational resources are anything tangible or intangible that an organization uses to implement business strategies. Once a firm possesses the ability to integrate and utilize organizational resources to create customer and shareholder value, they become its core competencies [26].

Operations capability is a firm's ability to improve its business processes, manufacturing, and logistics to make a firm an efficient and effective provider with a minimum wastage of organizational resources [9,22]: disciplines such as JIT, Six Sigma, TQM, and BPR are ways to promote operations excellence [21]. For some industries, operations capability can be a source of competitive advantage. For example, a firm can make its operations capability inimitable and imperfectly mobile if the functions have great complexity and the firm can utilize process knowledge to create and refresh operations capability over time [10]. In this case, operations capability tends to be dynamic and complex and a source of sustainable competitive advantage.

An R&D capability allows a firm to develop and apply new technology to effectively invent new products and services. It also provides a means to innovate or redesign manufacturing processes that lower production costs and improve product quality. Through organizational learning, an R&D process can embed firm-specific

knowledge, experience, and tacit knowledge that make the capabilities extremely difficult to imitate.

Marketing capabilities allow a firm to deepen its customer relationships, expand its market share, and enjoy greater financial gains. Because knowledge assets are tacitly held across several people or groups and needs to be developed over time, the development of marketing capability tends to be socially complex, path-dependent, and firm specific. Thus, we posited:

H2. Operations capability has a positive impact on strategic objective.

H3. R&D capability has a positive impact on strategic objective.

H4. Marketing capability has a positive impact on strategic objective.

2.3. IT-enabled resources

A firm must investment in training employees, enhancing IT, and aligning organizational routines to eliminate the gap between capabilities and needs for improved performance. However, organizational resources usually have limited effect on increasing the effectiveness of organizational capabilities. IT-enabled resources are assumed to be a force for organizational change in its operational and management practices. Strategic investments in IT-enabled resources also contribute to creativity in products and services [1,4]. They may also be critical to a firm's market-sensing and customer-linking ability [24]. They also improve a firm's ability to explore and exploit market opportunities and quickly respond to customer needs [13,18]; they are generally classified into technological IT resources (psychical IT assets and information repositories) and human IT resources (technical and managerial IT skills) and complementary organizational resources (non-IT resources that can interact with IT-dependent resources to generate synergy) [14].

IT resources help to improve most business functions [3]. However, research results on the relationship between technological IT resources and firm performance have been seen as paradoxical in many studies. IT resource relatedness can only serve as the source of temporary competitive advantages [23]. Individual dimensions of IT resources relatedness, however, can be integrated or combined with other non-IT resources into a complementary resource system that provides unique value to the firm. We therefore posited that:

H5. IT-enabled resources have impact of sub-additive synergy on operations capability.

H6. IT-enabled resources have impact of sub-additive synergy on R&D capability.

H7. IT-enabled resources have impact of sub-additive synergy on marketing capability.

H8. IT-enabled resources have impact of super-additive synergy on operations capability.

H9. IT-enabled resources have impact of super-additive synergy on R&D capability.

H10. IT-enabled resources have impact of super-additive synergy on marketing capability.

3. Research design

To test all our hypotheses, we conducted a survey to collect empirical data. Public manufacturing and service firms in Taiwan were used as survey subjects.

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