



# Application of information technology in creative economy: Manufacturing vs. creative industries<sup>☆</sup>



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## ABSTRACT

The primary purpose of this paper is to review the historical development of the application of IT, its relationships with corporate strategy, and its influence on corporate performance. The secondary purposes are to empirically investigate the above relationships and the differences in these relationships between creative and manufacturing industries and to identify the most powerful IT traits for a firm's success in each industry in Korea. The research findings confirmed that application of IT provides several kinds of competitive advantage such as efficiency, threat, functionality, attack, and integration, and that it significantly contributes to corporate performance. Application of IT plays significant roles in mediating between corporate strategy and performance. The research findings indicate that IT traits of efficiency and integration are the two most powerful competitive advantages for corporations. These research results indicate that corporate strategy is essential in delivering high corporate performance in both creative and manufacturing industries. Firms in creative industries should seriously consider IT traits of efficiency and threat, while firms in manufacturing industries should deeply take IT traits of efficiency and integration into account.

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## 1. Introduction

Information technology (IT) is a critical element for today's business. It supports corporate strategy and consumes a significant amount of a corporate's resources. Worldwide IT spending reached \$3.7 trillion in 2011, a jump of almost 8% from the previous year, and is projected to continue to increase (Pearson and Saunders, 2013). However, IT represents a significant investment for any corporation in today's business environment and the results can be disastrous if the IT investment does not support the organization in strategically outperforming its competitors. IT has intrinsic traits that can be utilized differently for different contingencies. For example,

one of IT traits, efficiency, is a critical component of the corporate's cost leadership strategy (Sethi and King, 1994). Thus a careful evaluation of relationships among application of IT, corporate strategy, and corporate performance is essential for organizational survival and growth.

The term creative economy first coined by Howkins (2001), has attracted worldwide attention. Creative economy may be defined as a policy that aims to generate new growth through economic operations that promote creativity, knowledge convergence, and advanced scientific technology based on coordinate learning, consequently creating a new market and new jobs. This may be inferred as representing a new paradigm in economic development that has evolved out of the chase-and-imitate economic model followed by most developing countries until now (National Information Society Agency, 2013). According to Howkins (2001), creative economy comprises advertising, architecture, art, crafts, design, fashion, film, music, performing arts, publishing, R&D, software, toys and games, TV and radio, and video games. An examination into noticeable differences in the application of IT in creative and manufacturing

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industries promises to be valuable as the results may better elucidate the nature and characteristics of creative economy.

The primary purpose of this paper is to review historical development of the application of IT, its relationships with corporate strategy, and its influence on corporate performance. The secondary purposes are to empirically investigate the above relationships and the differences in these relationships between creative and manufacturing industries and to identify the most powerful IT traits for a firm's success in each industry in Korea.

## 2. Theoretical background

### 2.1. Application of information technology (IT)

As early as the late 1970s, information system (IS) researchers recognized the competitive advantage being gained by some firms as they utilized IT and/or IS innovatively to decrease costs and/or increase revenues. Despite being theoretically premature, Gerstein and Reisman (1982) were the first to examine IT traits. Parsons (1983) published the first research on IT framework and proposed a three-level impact of IT on industry, firm, and strategy levels. McFarlan et al. (1983) introduced a strategic grid model to evaluate the strategic importance of existing and target IS. Later, McFarlan (1984) suggested opportunities to build strategically on Porter's (1980) five competitive forces by utilizing IS.

More sophisticated frameworks have been introduced with the progress in IT research. The customer resource life cycle model was developed by Ives and Learmonth (1984) and the strategic opportunity framework was suggested by Benjamin et al. (1984). Porter and Millar (1985) introduced the value chain analysis model, which became the most cited IT framework. More fundamental and theoretical works that began to appear from 1987 expanded the research framework to include field experiments, mathematical models, empirical studies, and in-depth case studies. Bakos and Treacy (1986) developed a causal model of IT traits. Malone et al. (1987) introduced electronic markets and the electronic hierarchy theory. In-depth case studies were reported by Johnston and Carrico (1988). Bakos (1991) and Barua et al. (1991) developed mathematical models to evaluate the economic aspect of IT investments. A new IT-based radical movement, Business Reengineering (BR), began to emerge in the 1990s. Despite the controversies over whether BR could be classified as IT-based methodology, most IS researchers agreed that BR was an important tool possessing strategic traits of IT (Hammer, 1990; Hammer and Champy, 1993; Davenport and Short, 1990; Davenport, 1993).

With the progress in both academic and management sectors, more systematic and theory-building papers were published. Feeny and Ives (1990) presented a framework for evaluating sustainability based on a competitor's anticipated response time, differences among competitors, and the potential of the application to preempt competitive responses. Bergeron et al. (1991) applied and compared two well-known methodologies (Porter's value chain and Wiseman's strategic thrust) for identifying IS traits from the competitive advantage perspective.

Another stream of research investigated the factors in the development of strategic application of ITs (Krcmar and Lucas, 1991; King and Sabherwal, 1992; Teo and King, 1994; King and

Teo, 1996). In contrast, real world strategic application cases were well documented by Clemens and Row (1991a) and Kettinger et al. (1994). Clemens and Row (1991b) maintained that firms seeking competitive advantage through innovative application of IT usually rely upon the unique resource strengths of the innovating firm, rather than upon competitors' difficulty in duplicating technology, in order to protect and sustain this advantage. Similarly, resource-based analysis was attempted by Mata et al. (1995). Neumann et al. (1992) sought to construct a measure capable of allowing an organization to find its position on the strategic grid by analyzing a small number of measurable organizational and IS variables. Regarding risk issues, McGaughey et al. (1994) maintained that the implementation of IT involves significant risks from both external sources and the technology and process of implementation. The appropriate risk management strategy depends on the nature of the risk and other situational variables that influence the organization's range of choice.

Although the aforementioned research identified and analyzed various IT traits, little comprehensive work has been conducted on measuring the impact of application of IT until the 1990s when Sethi and King (1994) published their landmark article. They firstly introduced empirically tested measures to assess the extent to which IT provides competitive advantage and secondly identified the following seven traits of IT dimensions: primary activity efficiency, support activity efficiency, resource management functionality, resource acquisition functionality, threat, preemptiveness, and synergy. These empirically tested measure of IT traits provide a basis for future IT research to justify, evaluate, and verify IT contributions to organizations.

Research on IT traits and IT competitiveness research have recently emerged. Tanriverdi et al. (2010) studied IT traits and commented on the quest of IS for complex adaptive business. Interestingly, the boundary-spanning role of IT was the main focus of Dewan and Ren's (2011) research, in which they examined the impact of IT on firm risk and return performance. Pavlou and El Sawy (2006) analyzed IT leveraging competence in turbulent environments based on new product development. The strategic value of IT was assessed conceptually and analytically by Oh and Pinsonneault (2007). Dehning et al. (2003) studied the value relevance of transformational IT investments. Wang and Ramiller (2009) focused on learning in IT innovations.

### 2.2. Alignment with strategy

The first paper relating IS or IT with corporate strategy was published by King (1978), who suggested that management information systems (MIS) strategic planning is the process via which an organization strategy set is converted into an MIS strategy set. This research emphasized the alignment between corporate strategy and MIS strategy. In 1980, Porter's (1980) "competitive strategy" introduced his competitive forces model and suggested three generic strategies, namely overall cost leadership, differentiation, and focus, to successfully defend against five competitive forces: rivals, potential entrants, substitutes, buyers, and suppliers. His book, along with "competitive advantage," (Porter, 1985) has become the foundation for strategy and IT research.

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