Discovering the Multifaceted Roles of Information Technologies with a Holistic Configurational Theory Approach

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Abstract

Information technologies enable organizations to successfully sense and manage market opportunities and threats in turbulent environments and therefore can enhance firm performance. On the other hand, IT can inhibit organizations from achieving high performance due to its inflexibility and the high cost of system implementation. This study explains the multifaceted roles of information technologies in enhancing firm performance by using a set-theoretic configurational theory approach. It investigates the holistic nature of the fused dynamic interactions among IT, organizational agility, and environmental turbulence. Specifically it focuses on explaining the opposing roles of IT as either an enabler or an inhibitor for competitive firm performance. Using field survey data from 106 Korean companies, this study empirically investigates configurations of high and low firm performance. By comparing similarities and differences between multiple configurations, we extract several patterns in a way that explains the different roles of IT in achieving competitive firm performance. We end by providing explanation for why this holistic approach is especially helpful in drawing new insights.

1. Introduction

Information technologies have great impacts on businesses in many different ways; for example, IT drives digital convergences [3] and changes the rules of the game in industries by providing new digital platforms [34]. IT creates a new governance mechanism for supply chains and a new way of communication between key stakeholders [21, 39]. Therefore, the impact of IT on firm performance has been a key issue in the IS literature [41]. While some studies argued that IT does not matter [4], IS studies have demonstrated the positive impact of IT on firm performance at the industry level [2].

However, we still continue to need and seek a better understanding of how individual organizations achieve different performance using information technologies. Studies on organizational capability argued that organizations can achieve competitive advantage by enhancing their dynamic capability to adapt to the rapidly changing environments [11]. Some studies argued that IT enables organizations to enhance dynamic capability [33, 38]. Pavlou and El Sawy [29] demonstrated that IT indirectly enhances firms’ competitive advantage through dynamic capability in the new product development context. On the other hand, some IS studies suggest an opposing role of IT as an inhibitor for organizational agility and performance. Due to its fixed artifacts and inflexibility in legacy systems, IT can hinder organizations from coping with rapidly changing environments [17, 32, 37]. Further, in stable environments IT-enabled agility can be costly because in slowly and predictably changing environments there are many alternative ways to achieve competitive advantage [9, 14] rather than rapid sense and response. Here, by organizational agility we mean an organizational ability to sense and respond to market opportunities and threats in a timely manner. It is considered a specific type of organizational dynamic capability [33].

The IS literature calls for rigorous empirical studies that investigate the role of information technologies in achieving competitive advantage with successful management of market opportunities and threats [14, 33]. This study responds to this call by empirically investigating how IT can help organizations to sense and respond to market opportunities and threats in a timely manner and achieve competitive firm performance. We adopt a configurational theory approach because it can effectively explain the holistic features of complex phenomena at a system level. We use the fuzzy-set qualitative comparative analysis (fsQCA) to describe how IT, organizational agility and environmental turbulence simultaneously and systemically combine to result in competitive firm performance. Using firm-level survey data, we find multiple configurations that result in competitive firm performance and configurations that result in low level of firm performance. By comparing the similarities and
differences between configurations, we extract several patterns that explain how IT plays different roles in achieving competitive firm performance depending on different environments.

In the following, we first explain a configurational theory approach and its benefits for studying complex dynamics of information technology, environmental turbulence and organizational capability. The research methods section describes construct developments, data collection and validity test. Next, we explain the empirical findings from a set-theoretic configurational analysis, followed by the insights and implications.

2. A holistic configurational theory approach

Digital ecodynamics, defined as “the holistic confluence among environmental turbulence, dynamic capabilities, and IT systems – and their fused dynamic interactions unfolding as an ecosystem” creates messy, complex phenomena, often resulting in nonlinear, discontinuous, and punctuated change [13]; for example, blurring existing industry boundaries [3], changing the rules of the game [34], and creating new organizational forms and structures [21, 39]. Such phenomena can be effectively captured by a configurational theory approach that can describe multi-way complex relationships in a holistic way [13]. Especially, a set-theoretic configurational theory approach can identify which elements are necessary and/or sufficient conditions for the outcome of interest, the two core building blocks of causality. Further, it expresses relationships by “half-verbal-conceptual and half-mathematical-analytical language [15, 30],” which can help more effectively describe the holistic complex fabric of digital ecodynamics. Therefore, this study uses a set-theoretic configurational theory approach to investigate the dynamic and complex interactions among information technology, organizational agility and environmental turbulence in a way that explains how they simultaneously and systemically combine to result in competitive firm performance.

Compared to the more popular correlation-based approach such as regression, this approach has many benefits for studying complex non-linear phenomena at a system level. In regression, all variables compete with each other in order to explain more portion of variance of a dependent variable. Therefore, it focuses on finding the net effect of individual variables on the dependent variable. On the other hand, a configurational approach treats a set of elements (i.e. a configuration) as a single predictor. All elements of a configuration together simultaneously explain the outcome of interest. Therefore, it can effectively explain complementary, synergetic effects of elements to produce an outcome. Further, the structure of configurations can change, meaning that individual configurations can have different elements playing different roles in producing an outcome. It focuses on finding the effect of a configuration on the outcome and finding patterns among elements of a configuration and/or patterns across configurations [13, 15]. The role of each element is presented as either core or peripheral and either present or absent, thus showing how individual elements play different roles in enabling a system to produce an outcome of interest. As such, rather than seeking the net effect of each variable on outcome variable, it seeks holistic patterns that show how elements systemically combine to produce an outcome, showing complementary and synergetic effects among elements [31]. Thus, it can effectively explore how a system or configuration can shift from one state to another state by changing its structure, meaning that it can capture the features of nonlinear change, jolt and disequilibrium.

This study uses fuzzy set qualitative comparative analysis, which is effective for exploring diversity of a complex system and building new theories [15, 30, 31]. Fuzzy set qualitative comparative analysis (fsQCA), an emerging set-theoretic configurational method, provides several unique benefits for advancing holistic and systemic understanding around digital ecodynamics [13]. This method can find out which elements of a configuration are core and essential to make the outcome of interest and which elements are peripheral. Core elements have a strong causal relationship with the outcome of interest, while peripheral elements are causal conditions of which causal relationships with the outcome are relatively weak [15]. It also shows which elements should present or absent in a configuration so that the configuration results in the outcome [15, 30]. With these properties, fsQCA can suggest several different configurations that result in the same outcome, meaning that a system can reach the same outcome through different paths from different initial conditions -- equifinality [15]. In digital ecodynamics, multiple configurations of IT, organizational dynamic capability, and environmental turbulence can result in competitive firm performance [13] and fsQCA can effectively capture a holistic and detailed causal dynamics within a configuration and between configurations regarding performance. Another attractive feature of fsQCA is that it can handle fuzzy variables of which values range from 0 to 1. fsQCA calibrates an interval scale variable into a fuzzy membership score ranging from 0.0 to 1.0 [30]. Calibration is a process of transforming interval scale values to fuzzy set membership scores based on three qualitative anchors: full membership, full non-
membership, and the crossover point of maximum ambiguity regarding membership in the set of interest [15, 31]. The set membership score represents the extent to which each case is a member of, for example, a high level of performance. Since the calibration process is based on both existing knowledge of the context and cases and the empirical data, it can more exactly define a group of cases that have similar memberships [15, 31]. The fsQCA software (available at www.fsqca.com) automatically rescales the interval scale into a fuzzy membership score using the direct method of calibration with three anchors [31, p. 86]. Direct calibration transforms an interval variable using the distance of the variable value from the crossover point, with the values of full membership and full non-membership as the upper and lower bounds [15]. Then, the distance is transformed into the metric of log odds, which is centered around zero and has no upper or lower bound. As such, calibration can tie attributes of cases to substantive theoretical concepts by infusing fuzzy sets with membership anchors based on empirical and theoretical knowledge.

Further, by comparing common and different features between cases, fsQCA can take out attributes that are not related to the outcome of interest. It uses a set-subset relationship to find out causal patterns [15, 31]. For example, to find out which configurations result in high performance, fsQCA examines cases that have membership in the set of high-performing organizations. Then, it identifies attributes associated with high performance using Boolean algebra and a set of algorithms that reduce logically numerous combinations into a small number of moderately parsimonious configurations (i.e., intermediate between too complex and too parsimonious configurations).

3. Research methods

3.1. Conceptual development

Based on the concept of “organization as flux and transformation with an information processing brain” from Morgan’s images of organization [25], this study synthesizes the existing environmental sensemaking and responding models [8, 12, 19, 36] and suggests an open-system event management model [Figure 1]. It explains how organizations sense business events generated from environmental changes and respond to them reactively or proactively. Based on this theoretical model, this study defines three event management tasks: sensing, decision-making, and acting, which are a series of interconnected activities to identify and manage market opportunities and threats.

The sensing task refers to the strategic scanning of environmental events that can have great impact on organizational strategy, competitive action, and future performance [8, 12, 36]. Sensing task includes such activities as acquiring information about events, in which environmental change is manifested, and filters out relatively unimportant information based on predefined rules [12]. This task initiates decision-making and acting tasks [8] that lead to organizational adaptation to environmental change or enact new environmental change [35].

![Figure 1. Open-system event management model](image)

The decision-making task consists of several inter-related activities that interpret the captured events and define opportunities and threats [36]. Organizations gather, aggregate, structure, and evaluate relevant information from diverse sources to understand the implications of the captured events to their business [36]. Through these activities, they define opportunities and threats. Then, they make action principles to maximize the effect of opportunities and minimize the effect of threats [19]. Action principles are guidelines to reconfigure resources and adjust business processes, and to initiate new competitive actions in the market.

The acting task consists of a set of activities to recombine organizational resources and modify business processes based on the action principles made from the decision-making task to address environmental change [11]. Organizations can change business processes with different procedures and resources, or redesign organizational structure [36]. The acting task also includes organizations’ new competitive actions to the market by introducing new products/services and new pricing models, and by changing policies with strategic partners and major customers [7, 36]. These enacted events are new environmental changes to which other market players like competitors, key customers, and suppliers should
respond. Sometimes, regulators also need to respond to these competitive actions to maintain healthy market conditions.

3.1.1. Organizational agility. Organizational agility is defined as an organizational ability to successfully sense and respond to market opportunities and threats in a timely manner [33]. By definition, agility enables organizations to successfully execute a series of tasks defined in the open-system event management model [Figure 1] that sense and manage opportunities and threats embedded in business events, which give rise to new innovations. This study defines three types of agility that correspond to individual event management tasks: sensing, decision-making, and acting agility. Sensing agility is an organizational ability to scan, monitor, and capture events from environmental change (e.g., customer preference change, competitors’ new moves, and new technologies) in a timely manner. Decision-making agility is an ability to gather, aggregate, structure, and evaluate relevant information from diverse sources to interpret the implications of captured events to business without delay, define opportunities and threats based on the interpretation of the events, and make action plans that guide how to reconfigure resources and make new competitive actions. Acting agility is an ability to dynamically reconfigure organizational resources, modify processes, and restructure supply change relationships based on the action plans and introduce new products, service and pricing models to the market in a timely manner.

As such, each type of agility represents the unique aspect of organization-level agility, and the three together build a whole concept. This means that organizational agility is a formative higher-order construct consisting of three domains [10]. Defining organizational agility as a second-order construct is in the same vein with existing organizational dynamic capability studies [29, 33]. Therefore, this study defines an organizational agility as a second-order formative construct consisting of three first-order constructs: sensing, decision-making, and acting agility.

3.1.2. IT capability. The IS literature defines a number of different types of IT systems by considering specific task contexts because, according to the task-technology fit theory, some types of information technologies can support specific tasks better than other types of information technologies [43]. This study defines three types of IT systems specific to the event management task context--- business intelligence (BI) systems, communication and collaboration (CC) systems, and business process and resource management (BPRM) systems.

BI systems are defined as a type of IT system that provides a set of functions for supporting organizational sensemaking of environmental change and acting, including monitoring and alerting functions for business events, accessing enterprise-wide consistent data warehouse, and what-if analysis and data visualization functions [1, 6, 40, 42].

CC systems are defined as a type of IT system that provides a set of interactive communication and collaboration functions. CC systems support real-time information dissemination, two-way communications between co-workers, and information sharing with key stakeholders, such as supply chain partners, key customers [39, 43]. Thus, CC systems enable managers to collectively make sense of the market events in a timely manner.

BPRM systems provide functions that automate business processes, visually present the structures of processes, and provide real-time information about resources and their dependencies on tasks [26, 29]. Thus, these functions can help firms dynamically redesign a process, add a new process, and rearrange and streamline processes. Enterprise resource planning (ERP) systems, supply chain management (SCM) systems and inventory management systems are typical examples of BPRM systems.

IT capability is a firm’s ability to mobilize, reconfigure and deploy IT resources to support work processes and tasks [29, 38]. Organizations can use the suggested three types of IT systems to support event management tasks, so this study defines a firm’s IT capability as a second-order formative construct consisting of capabilities provided by the three types of IT systems. Each type of IT system represents the unique aspects of organizational IT capability to support event management tasks. This means that a firm’s IT capability is a formative construct [10]. Defining organizational IT capability as a higher-order formative construct is in the same vein with existing IS strategy studies [29].

3.1.3. Environmental turbulence. This study defines environmental turbulence with the velocity concept. The velocity of environmental change has become central to the study of strategic management, which creates a number of critical business issues [11, 14]. The environment velocity is a multi-dimensional construct consisting of distinct dimensions: the speed and the direction of change [24]. The speed of change is the rate at which new opportunities emerge [9], the rate at which new products and services are introduced [14]. Unpredictability as the direction of environmental change is the amount of disorder, showing no
consistent similarity or pattern [9]. The increasing environmental velocity implies that changes in consumers’ preferences, competitors’ competitive actions or technologies become faster and more unpredictable.

3.4. Top management team energy. Existing strategic management and IS studies demonstrated the importance of top managers’ role in getting important information about and adapting to business environmental change. For example, according to theories of top management team (TMT), TMT energy plays a critical role in the successful organizational sensing and responding to environmental change [12, 18]. TMT energy has also proved one of the most important factors for information systems success, including BI systems [6, 42]. Top managers’ energetic initiatives for changing their organizations can help employees overcome resistance to change [22], and successfully drive employees to adopt and use information systems for their business event management. Further, top management teams play an important role in fostering innovation by encouraging experimentation, communication, and collaboration [23]. This study investigates how TMT energy interacts with other constructs in digital ecodynamics.

3.5. Firm size. This study takes a firm’s size into consideration, since it is a well-known factor that influences firm performance. To decide whether a company is small/medium business or large, this study follows the definition provided by the Korean Government agency for administering small and medium companies, “Small and Medium Business Administration (http://eng.smba.go.kr/).” The definition considers not only the number of employees and sales revenue but also other factors such as gross capital, industry types, and whether it is a child company of a large company. Thus, this definition can more precisely measure the firm size effects, because the support by Korean government for a company is different depending on whether it is either SMB or large.

3.2. Data collection

This study administered survey questionnaires to managers in Korean companies in diverse industries differing in the level of changing velocity. South Korea is one of the fastest recovering countries from the global economic crisis started from 2008 according to the OECD statistics on Quarterly Growth Rates of real GDP (http://stats.oecd.org/index.aspx?queryid=350). Therefore, the data set from Korean companies is relevant for this study, allowing us to explore how organizations successfully cope with turbulent environments and achieve competitive performance. Korea is also famous for its advanced information technologies; for example, it ranks first in high-speed internet coverage in the world and its economy relies heavily on the high tech industry. The survey used two major sample frames: a sample of companies associated with a university research center and a sample of companies related with professors in major Korean business schools. In return for their participation in the survey, an executive summary was provided. These two sampling frames do not represent a specific group, because the main purpose of this study is not to explore one specific industry or any group of organizations that share the same velocity of change. Instead, this study aims to explore the dynamics of sensemaking and responding of companies in diverse industries of which changing velocity is different. Further, fuzzy-set methods do not need a representativeness of the sample because it does not assume that the data are drawn from a specific probability distribution. Also, calibration that we use in this study for rescaling the interval scale to a fuzzy membership score can reduce sample dependence because set membership is defined relative to substantive knowledge rather than the sample mean [15].

A total of 218 responses from 106 firms were collected. Most of the data (91%) has been collected in 5 weeks starting April 2010. All incomplete responses were excluded from data analysis. Firm level response rate was 93%, and individual level was 90%. This high response rate can be explained either by the sampling method or by the interesting topic of this research when considering the topic of this study about organizational agility in turbulent environments is related with the on-going global economic crisis. The response characteristics of the survey sample did not show any sampling problems such as a selection bias and non-representativeness in terms of both individual and firm level. When there was more than one response from a firm, average scores across items for each construct were calculated. This method averages out the biases of individual responses and justifies normality assumptions, making parametric statistical methods more appropriate. The intraclass correlation coefficient (ICC) was relatively large, 25.2%, meaning that 25.2 percent of the total variance in performance is accounted for purely by the grouping of responses into firms. Thus, the advantage of collecting more than one response from a firm is statistically justified.
3.3. Measurement validation

Composite reliabilities were greater than 0.7 for all constructs, indicating internal consistency [27]. All Cronbach alpha values were greater than 0.7, an evidence of reliability [16]. The square root of average variance extracted (AVE) for individual constructs was greater than its correlations with other constructs and it was greater than 0.5. Further, all standardized item loadings were greater than 0.7 and loaded on their corresponding factors. Thus, constructs have discriminant and convergent validity [5, 16]. Further, Harmon’s single-factor test showed no common method bias [28].

4. Discovering the multifaceted roles of IT in configurations

This section presents the configurations of IT capability, organizational agility, environmental turbulence, and other organizational factor such as organizational size and TMT energy (i.e., top managers’ strategic commitment to change), which were found from fsQCA. This study extracts several patterns embedded in the configurations by comparing structures of configurations based on John Stuart Mill’s concepts of the “method of difference” and the “method of agreement” [15]. The patterns explain how the elements combine simultaneously and systemically to results in high or low performance.

4.1. Configurations for achieving high performance

Figure 2 shows the configurations resulted from fsQCA. The configurations are expressed by the notation systems from Fiss [15]. The dark shaded circles indicate the presence of an element, crossed-out circles indicate the absence of an element, large circles indicate core elements, and small circles indicate peripheral elements. Blank spaces indicate a “don’t care situation,” in which the causal element may be either present or absent.

<table>
<thead>
<tr>
<th>IT Capability</th>
<th>Organizational Agility</th>
<th>Environmental Turbulence</th>
<th>Organization Size</th>
<th>TMT Energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistency</td>
<td>0.93</td>
<td>0.87</td>
<td>0.87</td>
<td>0.92</td>
</tr>
<tr>
<td>Raw Coverage</td>
<td>0.60</td>
<td>0.46</td>
<td>0.95</td>
<td>0.24</td>
</tr>
<tr>
<td>Unique Coverage</td>
<td>0.06</td>
<td>0.02</td>
<td>0.09</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Overall Solution Consistency = 0.86
Overall Solution Coverage = 0.78

Figure 2. Configurations for achieving high performance

This study set the minimum acceptable frequency of cases for solutions at 3, and the lowest acceptable consistency cutoff at 0.9, which is above the minimum recommended threshold of 0.75 [31]. Overall, 77 cases fell into configurations exceeding the minimum solution frequency. Of these cases, 66 also exceeded the minimum consistency threshold of 0.9 for higher performance.

There are five different configurations that result in high performance, meaning five different paths to the same outcome (i.e., equifinality). Consistency for five configurations ranges from 0.87 to 0.93, acceptable levels [31]. Consistency roughly means that the degree to which a configuration of conditions consistently result in the outcome of interest. Raw coverage roughly means the extent to which each configuration covers the cases of outcome, in other words, the proportion of cases having outcome to the total cases [31]. Therefore, it shows what percent of cases having the outcome follow the path. For example, in Figure 2 the first configuration covers 60 percent of high performing cases, in other words, 60 percent of high performing cases have this configuration. Unique coverage means the part of the coverage of a configuration for the outcome that does not overlap with other configurations. Generally, raw coverage implies the importance of each path (i.e., configuration) to the outcome [31]. But without an acceptable level of consistency, high coverage is meaningless. Therefore, configurations with high consistency need to be found first, and then coverage...
needs to be considered [31, p. 55]. Overall solution consistency roughly means that the degree to which these configurations consistently result in high performance. Therefore, we can roughly say that these five solutions can consistently result in high performance with 87 percent. Overall solution coverage roughly means that the extent to which these configurations cover high performing cases [31]. In a fuzzy set relation, it explains what percent of membership for the outcome set can be captured by the configurations of conditions. Thus, these five configurations can explain 78 percent of high performing cases.

By comparing these five configurations, we found four strong patterns:

**Pattern 1)** In turbulent environments, IT plays a core role in achieving high performance (1, 2a), and in stable environments, a high level of IT capability should be absent for a configuration to result in high performance (2c, 3).

**Pattern 2)** In turbulent environments, regardless of organizational size, organizational agility with IT capability and TMT energy can most effectively achieve high performance (1 – highest coverage with great consistency).

**Pattern 3)** Large organizations with agility and energetic TMT can achieve high performance (2b).

**Pattern 4)** TMT energy is possibly a necessary condition for high performance when considering it exists in all configurations of high performance.

4.2. Configurations for achieving low performance

When investigating relationships, set-theoretic approach is not based on correlations that assume causal symmetry, but instead it is based on set-theory and Boolean algebra that can capture one-way causal direction of a relationship by showing necessary and sufficient condition separately [15, 31]. Further, configurations resulted from fsQCA are expressed with core/peripheral elements and present/absent elements. Thus, the structures of configurations for high performance can be different from those of configurations for low performance, meaning that fsQCA can investigate causal relationships that are asymmetrical (causal asymmetry). Figure 3 shows the multiple configurations for low performance, which have different structures from configurations for high performance.

**Figure 3. Configurations for achieving low performance**

Overall, 89 cases fell into configurations exceeding the minimum solution frequency of 2. Of these cases, 24 exceeded the minimum consistency threshold of 0.75 for low performance.

By comparing these configurations for low performance, we found three strong patterns:

**Pattern 5)** In turbulent environments, firms without a high level of IT capability and agility achieve low performance (1a, 1b).

**Pattern 6)** A high level of IT capability in stable environments can inhibit organizations from achieving high performance (3b).

**Pattern 7)** A high level of TMT energy is a core absent element for low performance both in turbulent and stable environments (3a, 3b).

4.3. Multifaceted roles of IT

Pattern 1 and 6 describe the different roles of information technologies for firm performance: in turbulent environments IT can enable organizations to rapidly sense and respond to market opportunities threats and introduce new innovations in a timely fashion [29, 33]. Such timely coping with environmental change in turbulent environments result in competitive firm performance [9].

However, in stable environments a high level of IT capability can be an inhibitor for high performance. In such slowly and predictably changing environments, information technologies for event management tasks may not significantly help organizations achieve competitive advantage. There could be other alternative paths to competitive advantage in stable
changing environments [9, 14]. Thus, too much investment in IT may be costly in stable environments.

Based on these commonalities among these patterns, this study suggests a proposition about the multifaceted roles of IT as follows:

**Holistic Proposition.** Patterns extracted by a configurational theory approach can effectively explain the multifaceted roles of information technologies in digital ecodynamics as either an enabler or an inhibitor for competitive firm performance. Specifically, these two opposing roles of information technologies can be simultaneously captured by rich combinatorial expressions of core/peripheral and present/absent elements.

5. Insights and implications

This study describes the multifaceted roles of IT as either an enabler or an inhibitor for competitive firm performance from a holistic configurational theory perspective. By comparing differences and similarities among multiple configurations, this study extracts several patterns that explain the two opposing roles of information technologies in achieving competitive firm performance. It shows that IT can be either an enabler or an inhibitor for competitive firm performance depending on different contexts. For example, while in turbulent environments IT plays a core role in achieving high performance, in stable environments a high level of IT capability should be absent for a configuration to result in a high performance. This finding also implies a possible contingency effect of environmental turbulence.

This study contributes to the literature on strategic advantage in turbulent environments by suggesting a new holistic configurational way of thinking the nature of a competitive arena. In frequently punctuated nonlinear change, configurational theories can better explain how a system shifts from one state to another state [13, 15]. The results of fsQCA describe how multiple configurations could achieve a similar level of performance, either high or low firm performance (i.e., equifinality). By comparing configurations of high performance and configurations of low performance, which have possibly different structures with different roles of elements, the results of this study show how one configuration moves from one state (e.g. high performance) to another (e.g. low performance) by restructuring its elements. Therefore, this study suggests a configurational way to achieve competitive advantage in environmental jolts and disequilibria, which is under studied in the IS and the strategic management literature. Further, this study practically contributes to managerial knowledge by showing how organizations transform to the IT-enabled agile organization with the most affordable costs and risks through multiple alternative paths.

6. References


