

## Association for Information Systems AIS Electronic Library (AISeL)

AMCIS 2009 Proceedings

Americas Conference on Information Systems  
(AMCIS)

2009

# IT Capabilities and Firm Performance: The Moderating Role of Institutional Pressures and the Mediating Role of IT Innovation Success

Minghao Huang

*Seoul National University, hmh625@snu.ac.kr*

JoongHo Ahn

*Seoul National University, jahn@snu.ac.kr*

Dongwon Lee

*Korea University, mislee@korea.ac.kr*

Follow this and additional works at: <http://aisel.aisnet.org/amcis2009>

### Recommended Citation

Huang, Minghao; Ahn, JoongHo; and Lee, Dongwon, "IT Capabilities and Firm Performance: The Moderating Role of Institutional Pressures and the Mediating Role of IT Innovation Success" (2009). *AMCIS 2009 Proceedings*. 653.  
<http://aisel.aisnet.org/amcis2009/653>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2009 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# IT Capabilities and Firm Performance: The Moderating Role of Institutional Pressures and the Mediating Role of IT Innovation Success

**Minghao Huang**  
Seoul National University  
hmh625@snu.ac.kr

**Joongho Ahn**  
Seoul National University  
jahn@snu.ac.kr

**Dongwon Lee**  
Korea University  
mislee@korea.ac.kr

## ABSTRACT

A review of the literature shows that the underlying mechanisms through which IT capabilities lead to improved firm performance are by no means clear, and IS researchers call for future research which develops better metrics for evaluating IT resources and examines the intermediate variables and context-related variables between IT capabilities and firm performance. This study integrates the moderating role of institutional context and the mediating role of IT innovation success into one structural model. The survey method has been conducted to test the proposed model and the results have been discussed in detail. This research helps identify the full chain of variables connecting IT capabilities to firm performance by adding an intermediate variable and a moderating variable. As a result, we suggest that firms should adapt to the different contexts with the distinct levels of institutional pressures in order to facilitate its IT capabilities to outperform than its competitors.

## Keywords

Firm performance, institutional pressures, institutional theory, IT capabilities, IT innovation success, resource-based view.

## INTRODUCTION

The relationship between technology and organization appears to be developing as one of the fundamental research topics in a new and ever more challenging way in the twenty-first century (Allen and Morton 1994). Among the majority of articles forming the early debates on technology and organization since the 1960s, there is a series of papers which focuses on a certain type of technology, namely, computers and information technology (IT) due to their revolutionary role in the way we live, work, communicate, and organize our activities (Preece et al. 2000). Despite the growing consensus on the definite and far-reaching impact of IT on managerial organization, academic researchers and industry practitioners have found it difficult to link IT with the anticipated benefits for an organization (Wade and Hulland 2004; Carr 2003).

With the comprehensive literature review, we claim that the resource-based view (RBV) alone cannot explain the impact of IT capabilities on firm performance exhaustively. Instead, we argue that a combined perspective obtained by adding insight from the institutional theory to RBV can fill the gap between the theory and the phenomena. RBV and the institutional theory differ in that RBV argues that the purpose for resources is to acquire a competitive advantage whereas the institutional theory suggests that organizations need resources to acquire legitimacy. But these two theories are not mutually exclusive. Substantial bodies of research from RBV (e.g. Barney 2001; Fahy and Smithee 1999) and the institutional perspective (e.g. DiMaggio and Powell 1983; Meyer and Rowan 1977) suggest that each provides useful insights for advancement. However, I find few empirical studies that apply such a combined perspective to study the IT capability and its relationship with firm performance. Therefore there is a need for developing an integrated perspective of RBV and the institutional theory into a single conceptual model that would explain the relationships between institutional pressures, IT capabilities, and firm performance.

With these in mind, we raise three important research questions: (1) Do IT capabilities explain the variance in firm performance? (2) Does IT innovation success mediate the relationship between IT capabilities and firm performance? (3) How do different institutional contexts, constituted through different configurations of regulatory, normative, and cognitive pressures, affect the RBV logic of IT capabilities on IT innovation success?

## LITERATURE REVIEW

### IT Capabilities and Firm Performance

#### *Resource-Based View and IT Capabilities*

Within IS discipline, Wade and Hulland (2004) have reviewed existing studies on RBV and categorized the major IT resources by figuring out six key resource attributes and sorting into three types of processes. Specifically, the studies on RBV generally tend to define resources broadly by including assets (Ross et al. 1996), core competencies (Prahalad and Hamel 1990), marketing resources (Capron and Hulland 1999), IT infrastructure (Duncan 1995), managerial IT skills (Mata et al. 1995), and IT capabilities (Bharadwaj 2000). Bharadwaj et al. (1998) integrate the scattered conceptualization of IT capability as a multidimensional construct which encompasses both the technical and organizational dimensions, and empirically investigated the nature and structure of IT capabilities. Bharadwaj et al. (1998) have suggested and subsequently validated a measure of IT capability with the following six dimensions: IT/business partnerships, external IT linkages, business IT strategic thinking, IT business process integration, IT management, and IT infrastructure. Each dimension has been found to be reliable and valid using psychometric testing on a sample of senior IS executives. We extend the empirical settings of Bharadwaj et al. (1998) to reorganize the IT capability construct by conducting a rigorous exploratory research on the six dimensions and to link with business performance as well.

#### *IT Capabilities and Firm Performance*

Early studies began their explorations on the potential of IT as a source of sustained competitive advantage by investigating the relative cost position of a firm (Porter 1980), a firm's ability to differentiate its products (Caves and Williamson 1985), and power relations with buyers and suppliers (Porter 1985). On the other hand, according to Powell and Dent-Micallef (1997), IT has a tight linkage with strategy. Porter and Miller (1985) and Bakos and Treacy (1986), for example, critically demonstrate the transformation of value-added chain, product, and industry structure to imply a changed competitive rule and the changed strategic behavior of firms. Further, Kettinger et al. (1994) conduct an analysis on the "classic cases" of strategic IT to figure out the sustainability factors and to imply that "an established technological base along with substantial capital availability may be a prerequisite for effective technology-based competition." The characteristic of the studies in that period is that case studies, anecdotes, and conceptual frameworks have been prevailed to support success stories of IT implementations (Powell and Dent-Micallef 1997; Mata et al. 1995).

We adopt the conceptual and operational definitions of IT capabilities developed by Bharadwaj et al. (1998) as well as their terminology except the fact that the second-order IT capability has been changed to plural form. As for the firm performance, Venkatraman (1989) disaggregated the firm performance into two different dimensions: growth (effectiveness) and profitability (efficiency). For each of these perceptual primary measures, senior managers are requested to indicate their relative position compared with their major competitors in the market. Thus, this study adopts the perceptual assessments of senior executives as the acceptable operationalizations of firm performance.

#### *Mediating Role of IT Innovation Success*

Because both IT capabilities and firm performance have multi-dimensional nature, it tends to mask the underlying relationships among the different sub-dimensions (Venkatraman and Ramanujam 1986). Therefore, it is necessary to explore the intermediate variables to make underlying mechanisms through which IT capabilities impact firm performance clearly (Barua et al. 1996; Barua and Mukhopadhyay 2000). Ray et al. (2005) suggest that enterprise-level impact of IT can be measured only through their intermediate (i.e., process) level contributions (Barua et al. 1995; Mukhopadhyay et al. 1997). The argument here is that IT is embedded into the specific activities and processes to form IT capabilities, and therefore, the impact of IT capabilities should be assessed where the intermediate effects are expected to be realized. In searching of the process-level rent creation intermediate variable, IT innovation success has been a good candidate, since the terminology of the IT capability is cross-used with IT innovation in this paper, compromising the slightly different definitions between them.

IT innovation success is defined as the extent to which a firm perceives the commercial success of IT-related innovations at the organizational level (Gatignon et al. 2002). Tarafdar and Gordon (2007) suggest that organizations can enhance the contribution of their IS in their innovation efforts by developing and strengthening relevant IT capabilities. Firms that fail to efficiently and effectively translate their IT capabilities into commercial success of IT innovation cannot expect to realize the potential of competitive advantage from these capabilities. Although there is no rich legacy in the extant literature, some of the efforts can still be found in both IS literature and marketing discipline. Ray et al. (2005) empirically examine the direct impact of IT capabilities on the customer service process at the intermediate level. Thus, the IT innovation success can be a mediating variable between IT capabilities and firm performance.

## Institutional Pressures and IT Capabilities

### *Combining RBV and Institutional Theory*

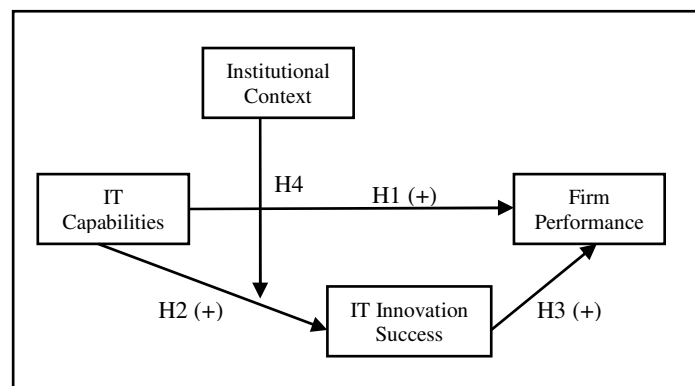
Oliver (1997) is one of the forerunners who try to combine the insights of RBV with the institutional perspective from the organization theory. She, from another perspective, criticizes the RBV logic in that it has not looked beyond the properties of resources and resource markets to explain enduring firm heterogeneity. In particular, RBV has not examined the social context within which resource selection decisions are embedded (e.g., firm traditions, network ties, regulatory pressures) and how this context might affect sustainable firm differences (Ginsberg, 1994). Nor has RBV addressed the process of resource selection, that is, how firms actually make, and fail to make, rational resource choices in pursuit of economic rents (Fernandez-Alles and Valle-Cabrera 2006). Fernandez-Alles and Valle-Cabrera (2006) claim that neo-institutionalism could help resolve the paradox. The combination of the institutional theory and RBV has emphasized the strategic dimension of the institutional theory and provides a better understanding of organizational behavior and market imperfections (Tolbert 1985; Oliver 1997). Due to the lack of resources to execute a longitudinal study on the strategic dimension of the institutional theory, we just focus on the moderating effect of institutional contexts, as well as the impact of IT capabilities on the organizational outcomes.

### *Institutional Pressures and IT Capabilities*

IT activities can be regarded as one of the organizational rational activities which reflect and are constrained by myths of institutional environments instead of the instrumental demands of their work activities (Meyer and Rowan 1977; Miranda and Kim 2006). IT activities spread so ubiquitously within the organization and across the organizations that we can hardly separate the pure organizational activities by neglecting IT activities. IT combined with the complementary resources is forming an innovative process. With this assumption and literature review (Bharadwaj et al. 1998; Bharadwaj 2000; Wade and Hulland 2004), we conceptualize the IT capability as a multidimensional construct embracing both the technical and organizational dimensions. However, both institutional factors and IT innovations have been studied in a fragmented way, and these studies neglect the fact that the regulatory, normative, and cognitive structures are inextricably intertwined in the constitution of institutional contexts (Miranda and Kim 2006). Although the three institutional factors affect the specific IT innovation individually, they are considered to be interdependent in forming different institutional contexts (Miranda and Kim 2006). Based on different research subjects (i.e., firms) and a distinct logic (i.e., RBV), we differentiate the concept of institutional contexts with Miranda and Kim (2006) by constituting it into high or low institutional pressures. Thus, we focus on how different levels of institutional pressures, constituted through different configurations of regulatory, normative, and cognitive pressures, moderate the effect of IT capabilities on IT innovation success.

## RESEARCH MODEL AND HYPOTHESES

We develop a research model based on the theoretical basis that has been discussed in the previous section as illustrated in Figure 1.



**Figure 1. Research Model**

IT capabilities, as valuable, rare and inimitable resources, help the firm to gain the competitive advantage. A firm's IT infrastructure capabilities, IT managerial capabilities, and IT strategic capabilities serve as firm-specific IT capabilities. While each of the individual first-order IT capabilities are complex to acquire and difficult to imitate, firms achieve competitive advantage by effectively and efficiently combining their first-order IT capabilities to create an overall IT

capabilities which reflect a firm's overall ability to sustain IT innovation and respond to changing market conditions (Bharadwaj et al. 1998). For example, IT infrastructure capabilities when combined with IT managerial capabilities become potent organizational capabilities. Likewise, successful firms employ their IT infrastructure base and IT managerial skills for developing IT strategic capabilities such as risk-taking climate, consistency of IT policies, and vision of IT business value. Although these capabilities themselves create superior applications, they can also form higher order capabilities to create above normal rents which are embedded in organizations in the form of bundles of routines (Nelson and Winter 1982), further bolstering the IT infrastructure base of the firm. Therefore, we develop the following hypothesis between IT capabilities and firm performance at the aggregate level.

*H1: IT capabilities will positively affect firm performance.*

As suggested earlier, one reason comes from the distinction between ex-ante and ex-post limits to competition in RBV (Peteraf 1993; Wade and Hulland 2004). As a result, the conceptualization of IT innovation success may act as the proxy of the initial competitive position of a firm. Specifically, a firm may commercially excel in some of its IT innovation, be only average in others, and be below average in still others. The overall perception on the success of IT innovations at the organizational level may be the prerequisites to get a superior competitive advantage which can be sustained. Tarafdar and Gordon (2007) suggest that organizations can enhance the contribution of their IS in their innovation efforts by developing and strengthening relevant IT capabilities. Firms that fail to efficiently and effectively translate their IT capabilities into commercial success of IT innovation cannot expect to realize the potential of competitive advantage from these capabilities. Thus, we hypothesize the following.

*H2: IT capabilities will positively affect IT innovation success.*

To figure out the relationship between IT innovation success and the superior competitive position, two conditions have to meet. The first condition assumes that a superior competitive position is the more than the results of net effect by aggregating the value of specific IT innovation successes (Meyer 2002). The second condition can be assumed and met from the result of the causal relationship between aggregate and single level measurements which is derived from Mittal et al. (1998) on customer satisfaction. Thus, we suggest the following hypothesis.

*H3: IT innovation success will positively affect firm performance.*

The institutional pressures here refer to three specific mechanisms or forces that engender consistencies within or across organizations over time, and they are regulatory/coercive forces, normative forces, and cognitive/mimetic forces which are considered by both lines of institutional theorists in sociology (Berger and Luckmann 1966; DiMaggio and Powell 1983; Meyer and Rowan 1977; Scott 1987; Zucker 1987; Miranda and Kim 2006). Borrowing the insights from the sociologists, Miranda and Kim (2006) view the institutions as interdependent structures of domination, legitimation, and signification and assume the institutionalization of organizations. The focus of this study is on the different levels of institutional pressures culminating from intersection of those three elements, rather than on the extent to which they individually influence IT capabilities (Zucker 1987; Miranda and Kim 2006).

This paper structurally analyzes the institutional contexts with high and low institutional pressures. The institutionalization of IT activities is imperfect, however, with the requirement to rapidly response to changing market competition and "bounded rationality" of the firm under the uncertainty and information asymmetry. Consequently, firms in different context of institutional pressures tend to form a variously legitimized and institutionalized IT capabilities as a routine of activities. Thus, the institutional pressures moderate the way IT capabilities impact IT innovation success through alternate institutional contexts constituted through inextricably intertwined regulatory, normative and cognitive structures (Giddens 1979, Miranda and Kim 2006). Therefore, rather than investigating the individual moderating effects of institutional pressures, we suggest a hypothesis that the different level of institutional pressures is considered in terms of institutional contexts culminating from intersection of those three institutional pillars (Zucker 1987; Miranda and Kim 2006).

*H4: The effect of IT capabilities on IT innovation success is moderated by alternate institutional contexts.*

## **RESEARCH METHODS AND DATA**

A survey was administrated to collect data from the large-sized firms in Korea. A sample was drawn from the alumni of AMP (Advanced Manager Program) of a well-known university in Korea. We have drawn 300 alumni who have registered in the four academic terms as potential respondents of the questionnaire. The revised survey was sent to about 217 alumni who are fit for this research design. By following up the 17 returned questionnaires by phone, we confirmed that two of them had errors in spelling of e-mail address and have been resent, and the other fifteen returned questionnaires were caused by the turnovers of the advanced managers. As a result, the questionnaire has been delivered to 202 alumni. Of the 202

questionnaires distributed, 86 questionnaires were returned and 80 questionnaires were completed and usable for the data analysis, showing an effective response rate of 39.6 percent. Cluster analysis was used to classify alternate institutional contexts, and PLS analysis was used to test the measurement model and the structural model.

## ANALYSIS AND RESULTS

### Cluster Analysis

The procedures to identify the institutional context of each firm were adapted mainly from the way suggested by Miranda and Kim (2006). To ascertain their institutional context, firms were subjected to a cluster analysis of their regulatory, normative, and cognitive pressures to ascertain their underlying institutional contexts. Instead of exploratory factor analysis (EFA) used by Miranda and Kim (2006), we extracted the latent variable scores by performing a confirmatory factor analysis (CFA) in PLS. We used the latent variable scores to ascertain the institutional context. We also followed most of the procedures used by Miranda and Kim (2006) without seeding the initial cluster centers obtained from the hierarchical cluster analysis for the lack of sample size.

### Measurement Model

Item reliability, convergent validity, and discriminant validity serve to evaluate measurement properties in PLS. Individual item reliability can be examined by observing the item-to-construct loadings. All the factor loadings are greater than 0.750 and exhibit acceptable quality of item reliability. The values of Cronbach's Alpha, composite reliability, and AVE indicate that all the other constructs in this study meet tests of convergent validity. The values of Cronbach's Alpha, composite reliability, and AVE of the constructs in each institutional context are also presented to meet the tests. According to Gefen and Straub (2005), discriminant validity is assured when (1) each item's correlation with its own construct greater than its cross-correlation with other constructs, (2) the value of the square root of the AVE of each construct is larger than the correlations of this construct to all other constructs, and (3) correlation between pairs of constructs is below 0.9. The results of our study demonstrate that the above conditions for discriminant validity hold. The values of cross factor loadings and the comparison between the values of the square root of the AVE of each construct in each institutional context are also presented to meet the tests.

### Structural Model

The proposed research model is assessed by examining the significance of paths in the structural model. Because the PLS method does not directly provide significance tests and confidence interval estimates of path coefficients, a bootstrap procedure with 500 subsamples is used to generate t-statistics and standard errors (Chin, 1998).

In Figure 2, the results of PLS analysis of the research model have been demonstrated. First, the coefficient from IT capabilities to firm performance in the model is not statistically significant ( $t = .256$ ), and the H1 is rejected. H2 and H3 are accepted with the values of path coefficients  $.738$  ( $t=13.370$ ) and  $.656$  ( $t = 4.97$ ) respectively which are significant at the level of 0.01.

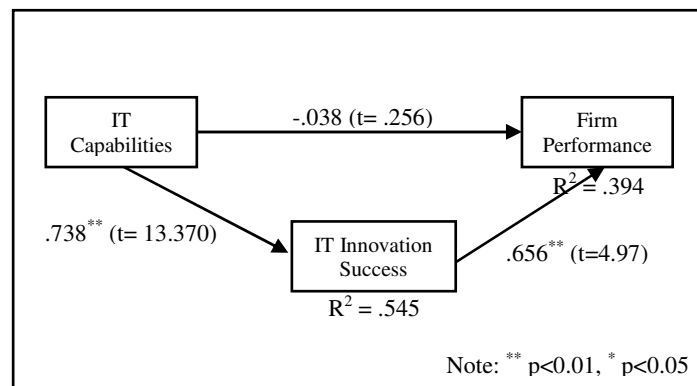


Figure 2. Results of PLS Analysis

### Mediating Effect of IT Innovation Success

Support of H2 and H3 signifies the mediation effect of IT innovation success between IT capabilities and firm performance. Based on the theoretical exploration, we follow the process that Baron and Kenny (1986) provide for testing the mediating effect of IT innovation success between IT capabilities and firm performance. The results show that IT capabilities affect firm performance through IT innovation success as a mediator (Baron and Kenny 1986). These results hold both for complete data and for each individual context.

### Moderating Effect of Institutional Context

To analyze the predicted moderation of RBV logic by the institutional context, multiple group analysis with PLS (Chin 2000) is conducted on each individual cluster respectively. This approach treats the estimates of the re-sampling in a parametric sense via t-tests. We make a parametric assumption and take the standard errors for the structural paths provided by PLS-Graph in the re-sampling output and calculate the t-test for the difference in paths between groups. Essentially, we run bootstrap re-samplings for the various groups and treat the standard error estimates from each re-sampling in a parametric sense via t-tests (Chin et al. 2003). By comparing the path coefficients between the two different institutional contexts and computing the t-value, H4 is accepted with the t-value = 5.285 which is significant at the level of .01 (See Table 1).

Path	PC&SE	High	Low	t-value	Results
IT Capabilities → IT Innovation Success	Path Coefficient	.803**	.680**	5.285	Accepted
	Standard Error	.086	.103		

Note: \*\* p<0.01, two-tailed test

**Table 1. T-test for the Difference in Path between Groups**

### DISCUSSION AND CONCLUSION

Combining the institutional theory and RBV, this research integrates the moderating role of institutional pressure context and the mediating role of IT innovation success on studying the relationship between IT capabilities and firm performance into one structural model. We reconcile the isolated “material” and “social” dimensions which are the result of different epistemologies between the fields of IS and organizational studies (Orlikowski and Barley 2001). Our theoretical framework reconciles divergent purposes of the two theories and further extends the related and complementary potentials that have proposed by Oliver (1997). To unmask the ambiguous underlying mechanism between IT capabilities and firm performance, this study explores the existence of mediating role of IT innovation success and further tests the moderating effect of institutional pressures context. Empirical results from 80 Korean firms support most of the hypothesized relationship in the model except the hypothesis 1 that IT capabilities will positively affect firm performance. However, the mediating role of IT innovation success and the moderating effect of institutional pressures context are both confirmed. This research contributes to the literature on IT capabilities and institutional forces by examining the relationship between institutional pressures, IT capabilities, and firm performance in a structural model and extending and enriching the extant literature on constructing IT capabilities and combining institutional theory and RBV. This study confirms the importance of adapting to different institutional pressures contexts to facilitate IT capabilities for above normal rents. This research also highlights the mediating role of IT innovations success through which IT capabilities impact the firm performance. Despite the limitations and flaws that the paper has, the empirical efforts have enriched the relationship between institutional pressures, IT capabilities, and firm performance theoretically and practically.

### REFERENCES

1. Allen, T. J. and Morton, S. M. (1994) Information technology and the corporation in the 1990s: Research studies, Oxford University Press, New York.
2. Bakos, J. Y. and Treacy, M. E. (1986) Information technology and corporate strategy: A research perspective, *MIS Quarterly*, 10, 2, 107-119.
3. Barney, J. B. (2001) Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view, *Journal of Management*, 27, 6, 643-650.
4. Baron, R. M. and Kenny, D. A. (1986) The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations, *Journal of Personality & Social Psychology*, 51, 6, 1173-1182.

5. Barua, A., Kriebel, C. and Mukhopadhyay, T. (1995) Information technologies and business value: An analytic and empirical investigation, *Information Systems Research*, 6, 1, 3-24.
6. Barua, A., Lee, C. H. S. and Whinston, A. B. (1996) The calculus of reengineering, *Information Systems Research*, 7, 4, 409-428.
7. Barua, A. and Mukhopadhyay, T. (2000) Information technology and business performance: Past, present, and future, in R.W. Zmud (Ed.) *Framing the Domains of IT Research: Projecting the Future through the Past*, Cincinnati, OH, Pinnaflex Educational Resources, 65-84.
8. Berger, P. L. and Luckmann, T. (1966) *The social construction of reality: A treatise in the sociology of knowledge*, Anchor Books, New York.
9. Bharadwaj, A. S. (2000) A resource-based perspective on information technology capability and firm performance: An empirical investigation, *MIS Quarterly*, 24, 1, 169-196.
10. Bharadwaj, A. S., Sambamurthy, V. and Zmud, R. W. (1998) IT capabilities: Theoretical perspectives and empirical operationalization, in R. Hirschheim, M. Newman, and J. I. DeGross (Eds.) *Proceedings of the Nineteenth International Conference on Information Systems*, Helsinki, Finland, 131-148.
11. Capron, L. and Hulland, J. (1999) Redeployment of brands, sales forces, and general marketing management expertise following horizontal acquisitions: A resource-based view, *Journal of Marketing*, 63, 2, 41-54.
12. Carr, N. G. (2003) IT doesn't matter, *Harvard Business Review*, 81, 5, 41-49.
13. Caves R. E. and Williamson, P. J. (1985) What is product differentiation, really? *Journal of Industrial Economics*, 34, 113-132.
14. Chin, W. W. (1998) The partial least squares approach to structural equation modeling, In: G.A. Marcoulides (Ed.) *Modern Methods for Business Research*, Mahwah, NJ, Lawrence Erlbaum, 295-336.
15. Chin, W. W. (2000) Frequently asked questions: Partial least squares and PLS-Graph, Home Page.
16. Chin, W. W., Marcolin, B. and Newsted, P. R. (2003) A partial least squares variable modeling approach for measuring interaction effects: Results from a monte carlo simulation study and an electronic-mail emotion/adoption study, *Information Systems Research*, 14, 2, 189-217.
17. DiMaggio, P. J. and Powell, W. W. (1983) The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields, *American Sociological Review*, 48, 147-160.
18. Duncan, N. B. (1995) Capturing flexibility of information technology infrastructure: A study of resource characteristics and their measure, *Journal of Management Information Systems*, 12, 37-57.
19. Fahy, J. and Smithee, A. (1999) Strategic marketing and the resource-based view of the firm, *Academy of Marketing Science Review*, 10, 1-21.
20. Fernandez-Alles, M. D. and Valle-Cabrera, R. (2006) Reconciling institutional theory with organizational theories: How neoinstitutionalism resolves five paradoxes, *Journal of Organizational Change Management*, 19, 4, 503-517.
21. Gatignon, H., Tushman, M. L., Smith, W. and Anderson, P. (2002) A structural approach to assessing innovation: Construct development of innovation locus, type, and characteristics, *Management Science*, 48, 9, 1103-1122.
22. Gefen, D. and Straub, D. (2005) A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example, *Communications of the Association for Information Systems*, 16, 91-109.
23. Giddens, A. (1979) *Central problems in social theory: Action, structure and contradiction in social analysis*, University of California Press, Berkeley, CA.
24. Ginsberg, A. (1994) Minding the competition: from mapping to mastery, *Strategic Management Journal*, 15, 153-174.
25. Kettinger, W. J., Grover, V., Guha, S. and Segars, A. H. (1994) Strategic information systems revisited: A study in sustainability and performance, *MIS Quarterly*, 18, 1, 31-58.
26. Mata, F., Fuerst, W. and Barney, J. (1995) Information technology and sustained competitive advantage: A resource-based analysis, *MIS Quarterly*, 19, 487-505.
27. Meyer, M. W. (2002) *Rethinking performance measurement: Beyond the balanced scorecard*, Cambridge University Press, Cambridge.
28. Meyer, J. W. and Rowan, B. (1977) Institutionalized organizations: Formal structure as myth and ceremony, *American Journal of Sociology*, 83, 2, 340-363.



29. Miranda, S. M. and Kim, Y. M. (2006) Professional versus political contexts: Institutional mitigation and the transaction cost heuristic in information systems outsourcing, *MIS Quarterly*, 30, 3, 725-753.
30. Mittal, V., William, T. R., Jr. and Patrick, T. B. (1998) The asymmetric impact of negative and positive attribute-level performance on overall satisfaction and repurchase intentions, *Journal of Marketing*, 62, 1, 33-47.
31. Mukhopadhyay, T., Rajiv, S. and Srinivasan, K. (1997) Information technology impact on process output and quality, *Management Science*, 43, 12, 1645-1659.
32. Nelson, R. R. and Winter, S. G. (1982) An evolutionary theory of economic change, The Belknap Press of Harvard University, Cambridge and London.
33. Oliver, C. (1997) Sustainable competitive advantage: Combining institutional and resource-based views, *Strategic Management Journal*, 18, 9, 697-713.
34. Orlikowski, W. and Barley, S. (2001) Technology and institutions: What can research on information technology and research on organizations learn from each other? *MIS Quarterly*, 25, 2, 145-185.
35. Peteraf, M. A. (1993) The cornerstones of competitive advantage: A resource-based view, *Strategic Management Journal*, 14, 3, 179-191.
36. Porter, M. E. (1980) Competitive strategy, Free Press, New York.
37. Porter, M. E. (1985) Competitive advantage, Free Press, New York.
38. Porter, M. E. and Millar, V. E. (1985) How information gives you competitive advantage, *Harvard Business Review*, 63, 4, 149-160.
39. Powell, T. C. and Dent-Micallef, A. (1997) Information technology as competitive advantage: The role of human, business, and technology resources, *Strategic Management Journal*, 18, 5, 375-405.
40. Prahalad, C. K. and Hamel, G. (1990) The core competence of the organization, *Harvard Business Review*, 79-93.
41. Preece, D., McLoughlin, I. and Dawson, P. (Eds.) (2000) Technology, organizations and innovation: Critical perspectives on business and management. Routledge, London.
42. Ray, G., Muhanna, W.A. and Barney, J. B. (2005) Information technology and the performance of the customer service process: A resource-based analysis, *MIS Quarterly*, 29, 4, 625-652.
43. Ross, J. W., Beath, C. M. and Goodhue, D. (1996) Develop long-term competitiveness through IT assets, *MIT Sloan Management Review*, Sloan Working Papers, 1-24.
44. Scott, W. R. (1987) The adolescence of institutional theory, *Administrative Science Quarterly*, 32, 4, 493-511.
45. Tarafdar, M. and Gordon, S. (2007) Understanding the influence of information systems competencies on process innovation: A resource-based view, *Journal of Strategic Information Systems*, 16, 353.-392.
46. Tolbert, P. S. (1985) Institutional environments and resource dependence: Sources of administrative structure in institutions of higher education, *Administrative Science Quarterly*, 30, 1, 1-13.
47. Venkatraman, N. (1989) Strategic orientation of business enterprises: The construct, dimensionality, and measurement, *Management Science*, 35, 8, 942-962.
48. Venkatraman, N. and Ramanujam, V. (1986) Measurement of business performance in strategy research: A comparison of approaches, *Academy of Management Review*, 11, 4, 801-814.
49. Wade, M. and Hulland, J. (2004) Review: The resource-based view and information systems research: Review, extension, and suggestions for future research, *MIS Quarterly*, 28, 1, 107-142.
50. Zucker, L.G. (1987) Institutional theory of organization, *Annual Review of Sociology*, 13, 443-464.