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Top Management Support of SISP: Creating Competitive Advantage with Information Technology

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Abstract

Top management's support for the IS function impacts the success of SISP and is especially vital to information intensive firms. Use of information technology in the electric utility industry is noteworthy because of the transitioning of the electric utility industry into a deregulated, more competitive environment. A strong relationship is hypothesized between top management support for SISP and the strategic use of IS. The relationship is expected to be stronger among electrics. A survey of CIOs and other members of top management from 161 companies, including 21 responses from electric utilities, reveals that top management's support of SISP does influence the use of IS for competitive advantage and supports study hypotheses.

Keywords: SISP, Competitive advantage, Top management commitment.

Introduction

A desirable consequence of strategic information systems planning (SISP) is the creation of an IS based competitive advantage. SISP is essential for companies that invest heavily in information systems and related technologies. Top management's support is a key determinant in the success of SISP. In the absence of this support, business strategies may be implemented with less than optimal information technologies. Electric utilities, undergoing increased competitive pressures, may use SISP to seek out IS-based strategic opportunities.

The Energy Policy Act of 1992 and mandates by state commissions have acted to dissolve the protection afforded service areas and move industry governance away from state and federal regulators and into the marketplace. CEOs of electric utility companies, beset with new demands for strategic decision-making, are beginning to recognize the increased importance of using IS strategically (Hansen, 1996; Gotschall, 1998).

A result of deregulation in the banking, airlines, and telecommunications industries, has been the increased value of information and information systems in countering market threats and creating market opportunities. IT has forced structural changes in the airline industry that have resulted in competitive advantages (Segars and Grover, 1995). Such change is having the same effect on electrics (Weiner et al., 1997).

The purpose of this study was to examine the influence of top management's support of strategic IS planning on the competitive use of information technology and determine if this relationship is different for the electric utility industry than for all other industries.

Literature Review

Top Management's Support of SISP

Research has shown that top management's support is vital to the successful implementation of IS strategies (Teo and King, 1997) and that progressive use of information technology is dependent upon top management's perception of the IS function (Jarvenpaa and Ives, 1990). Participation by the CEO in IS planning is vital in securing the participation of other members of top management (Lederer and Mendelow, 1988). Lack of top management involvement in IS planning can result in diminished returns on information technology investment and loss of market position (Bakos and Treacy, 1986).

Strategic IS Planning Practices

Organizations that align their business plans with IS strategies generally outperform those who do not (King, 1984; Das, Zahra and Warkentin, 1991). Most approaches to alignment assume that the IS plan is driven by and derived from the business plan (King, 1978). Unclear objectives, lack of top-down communication, absence of IS management from the business planning process, and absence of top management from the strategic IS planning process lead to poor alignment (Calhoun and Lederer, 1990). Alignment between the business plan and the IS plan (BP-ISP) versus alignment between the IS plan and the business plan (ISP-BP) is a dichotomy that reflects the integration of business knowledge with the knowledge of information resources and technology.

Optimum matching of technology and business processes requires the collaboration of other members of top management and a future vision for IT (Reich and Benbasat, 1996; Teo and King, 1997). Participation by all business executives supports coupling of tacit

knowledge with IS technology (Galliers, 1988). Participation by the CIO in the business planning process and organizational reporting status impacts IS effectiveness and alignment with organizational objectives and strategies (Raghunathan and Raghunathan, 1989). The synergistic combination of information technology with information systems and competencies can achieve an organizational competitive advantage.

Methodology

Survey Instrument

The research tool was a questionnaire mailed directly to 1,200 CIOs randomly selected from a list of over 12,000 U.S. firms. Government and non-profit institutions were excluded from the survey. The mailing included two questionnaires. The CIO (primary respondent) was instructed to hand the second survey to another member of top management (secondary respondent) who was separate from, but familiar with, the IS area. The secondary respondent was provided instructions and a separate return envelope to minimize any influential bias from the primary respondent.

Usable surveys were provided by 161 primary respondents and 107 secondary respondents. Survey questions all followed a seven-point Likert type scale with the following responses: (1) Strongly Disagree; (2) Mildly Disagree; (3) Disagree; (4) Neutral; (5) Mildly Agree; (6) Agree; (7) Strongly Agree. Study variables are summarized in Table 1.

Table 1 Study Variables and Literature Sources

Independent Variables	Name	Measured by
Top management perception of IS	TMPER	Top Mgmt
CEO participates in IS planning	CEOPART	CIO
Business plan is aligned with IS plan	BP-ISP	CIO
Dependent Variables		
CIO participates in business planning	CIOPART	CIO
IS plan is aligned with business plan	ISP-BP	CIO
Use of IS for competitive advantage	CA	CIO

Hypotheses and Operationalization of Study Variables

Top management support of SISP was represented by three independent variables: top management perception of IS (TMPER), CEO participation in SISP (CEOPART), and alignment of the business plan with the IS plan (BP-ISP). Executive involvement is influenced by the CEO's participation in SISP (Jarvenpaa and Ives, 1991). Knowledge of information assets and IS opportunities is essential to the optimal matching of technology with processes.

SISP practices were represented by three dependent variables: CIO participation in business planning (CIOPART); alignment of the IS plan with the business plan (ISP-BP); and the use of IS for competitive advantage (CA). When the CIO attends planning meetings, has frequent contacts with the CEO, and contributes to the formulation of business goals, IS investments are more likely to support business objectives (Rackoff, Wiseman and Ullrich, 1985).

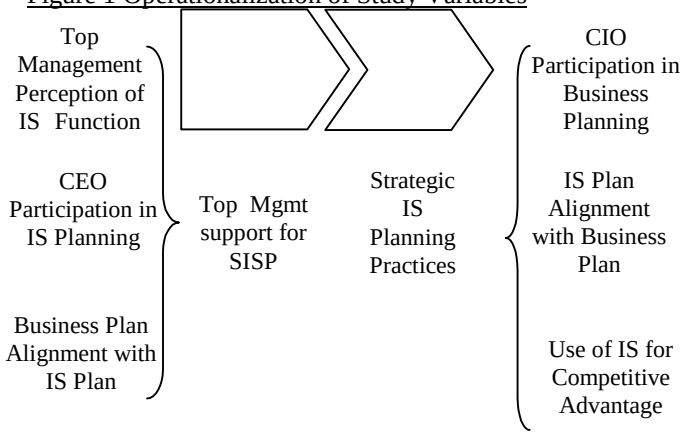
Porter's market forces model (1980) and subsequent extensions of the model for IS-based solutions provide measures for relating IS-based investment to organizational competitive advantage (McFarlan, 1984). The relationship between the study variables is depicted in Figure 1. This relationship provides the foundation for the first hypothesis:

H1: There will be a positive and strong relationship between top management's support for SISP and the competitive use of information technology.

Survey responses were separated into two groups: electrics and non-electrics (e.g., all other industries). Electrics represent an industry in transition similar to the past deregulation of airlines, banks, and telecoms. The 21 electric companies included in this study have experienced greater than average pressures from deregulation. These companies have experienced increased market competition and could be expected to seek increased strategic reliance on information systems and technology. Thus, the electric group might exhibit a stronger relationship between top management support for SISP and the competitive use of IT. This provides the foundation for the second hypothesis:

H2: The relationship between top management's support for SISP and the competitive use of information technology will be stronger for the electric industry than for all other industries combined.

Figure 1 Operationalization of Study Variables



Survey Results

Study data revealed a consistent difference between the perceptions of electric utility executives (n = 21) and executives from non-electrics (n = 140). Average responses for demographics and each of the survey variables appear in Table 2 for both electric and non-electric respondents. Average responses were calculated by averaging over all questions used as measure for the study variable. A discussion of these responses follows.

Profile of Chief Information Officers and Other Top Management

From Table 2, years of education, years in the functional area, years in the industry, and years with the company were profiled for both CIOs and other members of top management. Responses for CIOs from electrics showed significant differences for three of the four measures.

The ratio of IS employees to total employees was calculated as a measure of the importance of the IS function. The ratio demonstrates the electric utility industry's strong current reliance on information systems and technology where 3.4 employees per 100 are in the IS function as compared to 2.2 employees per 100 in other industries.

Top Management Support for SISP

Correlations between study variables appear in Table 3 for non-electrics and electrics. All nine correlation coefficients measuring the relationship between the three independent variables and the three dependent variables show moderate to strong associations for both groups. CEO participation in IS planning is strongly associated with the alignment of the business plan with the IS plan for both electrics (r = .855) and non-electrics (r = .525).

Table 2 Average Responses for Survey Variables

	Average Responses	
Responses have been averaged over survey questions for each of the variables. Responses range from 1 to 7.	Electrics (n = 21)	Non-Electrics (n = 140)
Other Top Management		
Years of education	5.0	5.5
Years in functional area	4.2	4.8
Years with company	16.1	14.6
Years in industry	18.2	18.6
Chief Information Officer		
Years of education	6.5	4.8
Years in IS area	25.0	20.1
Years with company	16.9	11.6
Years in industry	20.1	17.1
Reporting status	1.75	1.85
IS employees per 100 employees	3.4	2.2
Independent Variables		
Top mgmt's perception of IS function	5.20	5.66
CEO participation in IS planning	4.29	4.42
Business plan is aligned with IS plan	4.14	4.43
Dependent Variables		
CIO participates in business planning	4.92	5.16
IS plan is aligned with business plan	5.52	5.29
Use of IS for competitive advantage	4.46	4.62

For electrics, both CEO participation and BP-ISP alignment appear to be important determinants of the use of IS for competitive advantage. Five of the six correlated values for the electrics exceed those of the non-electrics for the CEOPART and BP-ISP variables.

Table 3 Correlation of Study Variables

	TMPER	CEOPART	BP-ISP
Non-Electric Responses*			
ISPART	0.386	0.710	0.496
ISP-BP	0.448	0.361	0.597
CA	0.504	0.474	0.438
Electric Responses*			
ISPART	0.641	0.618	0.625
ISP-BP	0.197	0.749	0.673
CA	0.47	0.727	0.789

*All coefficients significant at .01 level.

Strategic IS Planning Practices

The moderate to strong correlation coefficients between the independent and dependent variables serve to demonstrate the association of IS outcomes with the attitudes of executives outside the IS area. Surprisingly, top management's perception does not appear to have much influence on ISP-BP alignment in the electric utility industry (r = .197). If such alignment is already prevalent among electrics (as indicated by the average response of 5.52 in Table 2) then it may not be influenced by top management's perception of the IS area. Conversely, top management's support appears to have a strong influence upon the participation of electric CIOs in business planning (r_{TMPER} = .641, $r_{CEOPART}$ = .618, $r_{BP\text{-}ISP}$ = .625). All correlations between the independent variables and the CA variable were moderate to strong indicating the importance of management support of SISP to the use of IS for competitive advantage.

To further analyze the relationship between the independent and dependent variables, a multiple regression analysis was run separately for both groups. Results are presented in Table 4. Adjusted coefficients of determination (R^2) are high for electrics and non-electrics and all are highly significant. Electrics, however, show notably higher values of R^2 for the two dependent variables ISPART (R^2 = .783) and ISP-BP (R^2 = .595) than for non-electrics (R^2 = .545 and .401 respectively) while the R^2 for the CA variable is identical for both groups (R^2 = .423). Thus, there appears to be evidence that the associations are higher for electrics than non-electrics.

Table 4 Multiple Regression Between Independent and Dependent Variables

	Adjusted R^2	F
Results For Non-Electric Cos		
IS Participates in Bsns Plannning	.545	39.3
IS Plans are Aligned with Bsns Plans	.401	22.4
Use of IS for Competitive Advantage	.423	24.4
Results For Electric Cos		
IS Participates in Bsns Plannning	.783	14.3
IS Plans are Aligned with Bsns Plans	.595	6.40
Use of IS for Competitive Advantage	.423	5.86

Discussion

Support for Hypotheses

The survey data supported both hypotheses. Responses revealed that both groups exhibited moderate to high correlations between top management's perception of IS and the competitive use of information technology. Both groups also exhibited moderate to high regression coefficients between the independent variables and the dependent variables. These points were taken as evidence that there is a positive and strong relationship between top management's support of IS and the competitive use of information technology. Thus, H1 was supported.

H1: There is a positive and strong relationship between top management's support for SISP and the competitive use of information technology.

Overall, electrics had higher correlations (six of nine) than non-electrics between the independent and dependent variables. Also, for the electrics, two of the regression coefficients were notably higher than for the non-electrics while the third coefficient was identical. Thus, H2 was supported.

H2: The relationship between top management's support for SISP and the competitive use of information technology is stronger for the electric industry than for all other industries combined.

Contributions for Researchers and Practitioners

This study demonstrates that top management's support for SISP is highly related to the use of IS for competitive advantage. The study indicates that it is possible that top management does not realize greater alignment is possible due to the top-down nature of planning in many organizations. This study presented a dichotomy of alignment (BP-ISP and ISP-BP). Despite rapid changes in technology, strategic initiatives cannot adequately leverage available technology without the synchronization that is provided by both BP-ISP and ISP-BP alignment.

Finally, the study compared an industry in transition to a more hostile environment to other industries. For such industries in transition the further integration of business and IS strategies accomplished by BP-ISP alignment and the involvement of other top management in SISP, might lead to first-mover advantages similar to those experienced by other industries losing regulatory protection.

Future Research

Future research could amplify the findings of this study. As electrics move to a purely competitive model, a new survey might reveal increased attention from top management. If such were the case, then the impact of market hostility upon the relationships described in this study would become more apparent.

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