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# EFFECTS OF ABSORPTIVE CAPACITY ON ORGANIZATIONAL PREDISPOSITION TOWARD INFORMATION SYSTEMS

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## Abstract

*This paper draws on the theory of absorptive capacity and related work to identify its dimensions and examine its impact on organizational propensity to adopt novel, complex interorganizational technologies. Specifically, it seeks to examine the causal pathway through which absorptive capacity affects organizational adoption intention. Survey-based research was carried out to test this theory. Data was collected from the CEO, the CFO, and the CIO to measure the level of absorptive capacity and its dimensions, and their intentions to adopt financial electronic data interchange (FEDI). A firm-level structural model was developed. LISREL and PLS were used for testing the measurement and structural models respectively. The results indicate that absorptive capacity's relationship with adoption intention is mediated by decision-makers' attitudes toward using FEDI. Preexisting related knowledge and aggressiveness of technology policy contribute significantly to absorptive capacity's impact on adoption intention. Implications for theory and practice are discussed.*

**Keywords:** Absorptive capacity, innovation adoption, attitudes, EDI, financial electronic data interchange

## Introduction

Recent studies on the organizational adoption and use of complex technologies have suggested that prospective users encounter significant challenges in learning how to effectively harness the technology to achieve performance gains (Fichman and Kemerer 1997; Vinding 2000). It is suggested that to deploy these new complex technologies and apply them to commercial ends, adopting organizations generally have to undergo a learning process aimed at obtaining sufficient knowledge to narrow the gap between their current state of knowledge and that required by the novel, complex technology (Fichman and Kemerer 1997). Indeed, recent technological innovations and their applications have become increasingly knowledge-intensive, and organizations have to improve their capabilities to assimilate them effectively in order to remain viable in this hypercompetitive, knowledge-based economy (Von Hippel 1988).

Toward this end, it becomes paramount that we understand how an organization's capabilities to assimilate the technology are formed, and how they affect organizational intention to adopt novel, complex technologies. This paper thus draws on the theory of *absorptive capacity* (Cohen and Levinthal 1990) and related work to identify its dimensions and examine its impact on organizational propensity to adopt novel, complex technologies. An organization's *absorptive capacity*, defined as the *ability* to appreciate, adopt, and apply an innovation to achieve its organizational objectives (Cohen and Levinthal 1990, 1994), has profound influence on innovative behavior, which in turn affects the competitiveness and viability of the organization. Indeed,

past research has pointed out that the source of most innovations stems from borrowing rather than inventing (Von Hippel 1988). Conversely, an organization without this *ability* would be less likely to take a more proactive stance toward that innovation for fear of making the wrong judgment or not being able to implement that innovation appropriately.

To test the predictions of this theory, data was collected from 222 Singapore-based organizations to investigate the impact of absorptive capacity on intent to adopt an information system—*financial electronic data interchange* (FEDI). Using structural equation modeling, we examine the causal pathways through which an absorptive capacity could influence adoption intention: one in which it has a direct effect and another where its effect is mediated by an intervening variable, attitudes toward using FEDI. FEDI, an interactive technological innovation that facilitates the electronic transmission of structured payment and remittance information between a corporate payer, corporate payee, and their respective banks (O’Hanlon 1993), is a strategic system that could potentially enhance the efficiency and effectiveness of cash disbursement and collection processes. Because various EDI systems are regarded as complex innovations that impose knowledge and work-process reengineering burdens on the adopting organization (McGowan and Madey 1998), FEDI represents a good test case for the application of the theory of absorptive capacity.

Overall, our study has several important implications. The validation of absorptive capacity impact on adoption intention and the concomitant enumeration and the understanding of organizational factors that form it would (1) provide to diffusion practitioners a basis for more targeted marketing and promotion, (2) encourage potential adopters to make a more critical self evaluation in terms of their readiness to adopt new technology; and (3) help focus attention on building necessary internal capabilities to be able to absorb new technologies. From a theoretical standpoint, this research throws some light on the causal pathway through which absorptive capacity affects adoption intention.

## Conceptual Foundation and Hypotheses

### *Dimensions of Absorptive Capacity*

The absorptive capacity of an organization has attracted tremendous attention from organizational and innovation researchers. While much attention has focused on the relationship between absorptive capacity and innovative behavior, very few studies have identified clearly the dimensions of absorptive capacity that would contribute to innovative behavior, particularly in the domain of information technology adoption. Toward this end, our review of the literature on absorptive capacity, information system and technology adoption, and organizational innovation yields the following dimensions of absorptive capacity: preexisting related knowledge (Cohen and Levinthal 1990, 1994; Fichman and Kemerer 1997), managerial proclivity to change (Damanpour 1991), aggressiveness of technology policy (Ettlie et al. 1984) and the degree of existing information technology (IT) infrastructure sophistication (Boynton et al. 1994; Colombo and Mosconi 1995). These dimensions should serve as the bases upon which organizations can be differentiated in their ability to appreciate, adopt, and implement FEDI.

### **Preexisting Related Knowledge**

Preexisting related knowledge is the extent of abstract knowledge, know-how, and skills possessed by the organization in areas related to the focal innovation (Fichman and Kemerer 1997). Cohen and Levinthal (1990) argued that a firm’s absorptive capacity is a function of its level of prior related knowledge accumulated in the history of the organization. Possessing some knowledge related to the new technological domain will allow the organization to better evaluate external, new technological advances and predict more accurately the commercial potential of such advances. Indeed, empirical studies have found that cumulative knowledge in a particular domain will make it much easier for organizational decision makers to assess and adopt the focal innovation. For instance, Kemerer (1992) found that organizations that already had a methodology in place deployed a supporting CASE tool more successfully than those organizations that did not. In the context of FEDI adoption, preexisting related knowledge refers to an organization’s set of skills and experience with implementing information technology and (other) EDI applications, performing electronic data processing auditing, and using computerized accounting systems. Possessing these knowledge and skills should enhance an organization’s ability to acquire and exploit new knowledge required for FEDI adoption.

### **Managerial Proclivity to Change**

Managerial proclivity to change represents the extent to which managers or members of the dominant coalition are in favor of change (Damanpour 1991). The orientation of the management team has significant shaping effects on organizational culture.

Managerial proclivity to change could lower organizational inertia. A pro-change management team could foster an internal climate supportive and conducive of activities of assimilating, exploring, and applying new trends and technologies related to the business. On the contrary, the organization may develop resistance to learning new knowledge if the management team has a negative attitude to change. Therefore, the presence of managerial proclivity to change would allow the organization's members to develop receptive attitudes to change.

Managerial attitude to change may also influence the organization's decision-making in areas important to assimilate innovative knowledge (Damanpour 1991). For example, it could affect resource allocation in research and development, which is critical for developing organizational ability to innovate and learn (Lenox and King 2002). The open attitude to change in management team may help the organization to build some mechanisms that encourage individual members to engage in activities that contribute to its absorptive capacity. These mechanisms may include environmental scanning systems to acquire new knowledge and trends as well as regular dialogues across functional and hierarchical boundaries to ease knowledge sharing and integration. Through these mechanisms, organization members' knowledge base and ability could be enhanced and eventually transform into organizational absorptive capacity.

### **Aggressiveness of Technology Policy**

An aggressive technology policy, defined as a preemptive, long-range strategy for technological innovation or as a set of actions taken by an organization to keep itself technologically ahead of other organizations, is generally considered to promote innovative efforts. An aggressive technological posture can signal specific competitive initiatives and resources (Lefebvre et al. 1997; Porter 1985). As such, organizations with an aggressive technology policy tend to expend greater effort on trying out new technologies and scanning the technological sectors for new technological developments (Ettlie and Bridges 1982). During the trial and assimilation processes, organizations may develop the skills that are essential for absorbing new knowledge and technology, which may directly promote organizational absorptive capacity. As the same time, aggressive technology policy allows organizations to expand and enhance their knowledge bases in the processes of new technology assimilation. The gained knowledge would produce reciprocal effects, which facilitate organizational future knowledge absorbing since the learning distance organizations have to travel has been substantially shortened (Cohen and Levintal 1990; Fichman and Kemerer 1997).

### **IT Infrastructure Sophistication**

IT infrastructure represents the underlying system resources (hardware and software components) that could be harnessed by an organization to achieve its organizational and information system objectives. Prior research has proposed that any technological innovation adoption should be based on an organization's technological strengths (Damanpour and Evan 1984). Having the necessary infrastructure in place may improve the absorptive capacity of an organization by facilitating its access to new discoveries and knowledge from the external environment when adopting the technological innovation (Weiss and Birnbaum 1989). Sophisticated infrastructure channels and invention process conditions also help reduce the costs and risks, and leverage the synergistic and complementary resources during the innovation adoption process (Colombo and Mosconi 1995), leading to higher confidence and more receptive attitudes toward the innovation among organizational decision-makers. Shortage of system resources has been found to inhibit the assimilation of information technology (Ferguson et al. 1990). In the context of using of FEDI, IT infrastructure involves hardware, software, and computer networks, and good communication links with banks and trading partners.

### ***Absorptive Capacity and Adoption Intention***

The conceptual framework depicted in Figure 1 illustrates the main features of our theoretical model. Attitude toward using the focal innovation acts as the mediating variable, without which we would have a conventional regression model approach whereby the effects of absorptive capacity together with the control variables are estimated. Our theoretical model, besides estimating absorptive capacity's direct impact on adoption intention, however, also suggests that it could affect attitude toward using the focal innovation, which in turn influences adoption intention.

Many studies examining the theory of absorptive capacity have argued that the innovative behavior of an organization is determined largely by its ability to appreciate, adopt, and implement an innovation (Cohen and Levinthal 1990). The greater an organization's absorptive capacity, the more sensitive and proactive it is toward emerging technological opportunities. Organizations with higher levels of absorptive capacity tend to have higher aspiration level, regardless of the current performance.

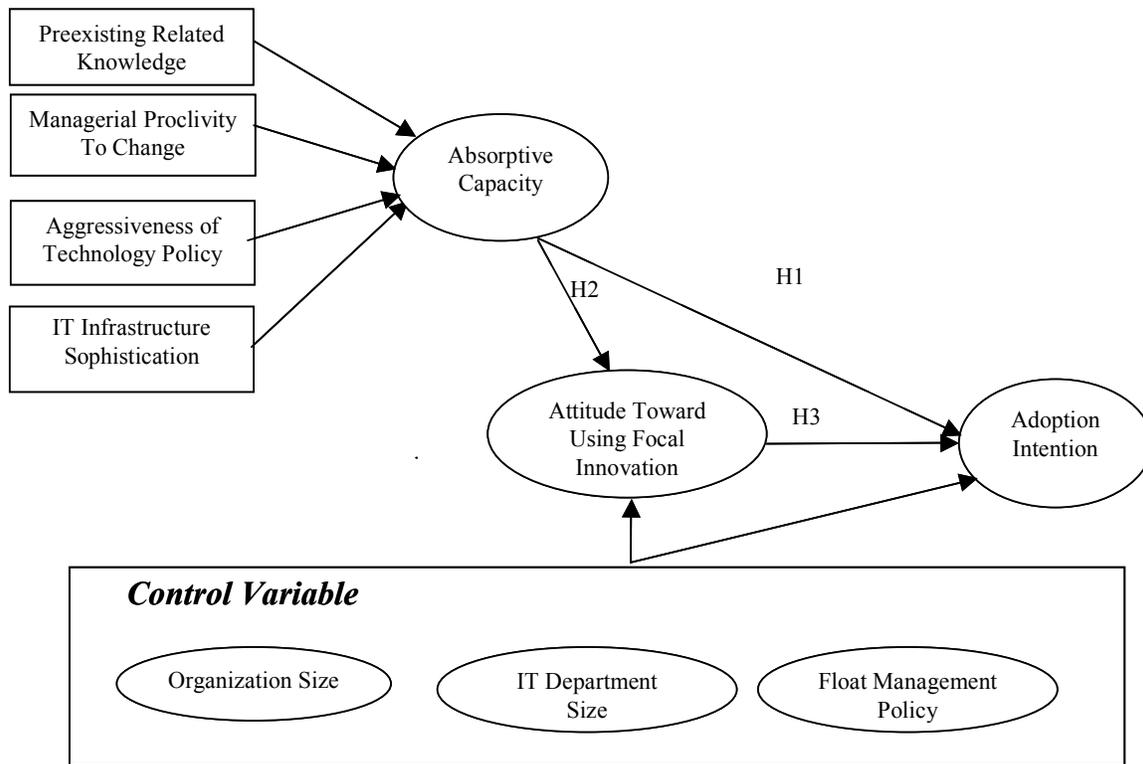


Figure 1. Research Model

In contrast, organizations with a modest or low absorptive capacity are likely to be reactive and passive, and usually search for new technologies from outside only in response to difficulties and failures. Greater in-house absorptive capacity would motivate an organization to invest more on research and development and information gathering, which would in turn improve their ability to adopt and exploit external technological opportunities (Becker and Peters 2000; Knudsen et al. 2001). Overall, organizations with greater absorptive capacity tend to be more ready to understand and exploit new advances in a particular knowledge domain, and should have a stronger intention to adopt a technological innovation. Thus, we hypothesize:

*H1: Higher level of absorptive capacity will lead to greater intent to adopt FEDI.*

The main thrust of existing studies on absorptive capacity centers on the direct relationship between absorptive capacity and adoption intention, and ignores the possibility that an organization's absorptive capacity could shape the attitudinal perspectives of the organizational decision-makers, which would in turn affect their adoption intention. Several researchers have suggested that organizational characteristics may shape the attitudes and thus constrain the technological choices of organizational decision-makers (e.g., Eveland and Tornatzky 1990; Jelinek and Burnstein 1982). Similarly, the organization-innovation fit literature argues that organizational decision-makers adopt technologies that are deemed appropriate and compatible for the organization (e.g., Boynton et al. 1994). Thus, organizational decision-makers are likely to possess more receptive attitudes toward an innovation if an organization is well-positioned to exploit it effectively. The attitudes of key organizational decision-makers on an innovation are particularly important in organizational adoption decisions (Rogers 1995). Indeed, theories and empirical studies of IT innovation adoption at the individual level have emphasized and validated the importance of attitude in influencing behavioral intention and usage behavior (e.g., Davis et al. 1989; Taylor and Todd 1995). Hence, we hypothesize:

*H2: Higher level of absorptive capacity should lead to more positive attitudes toward FEDI.*

*H3: More positive attitudes toward using FEDI should lead to a higher intent to adopt FEDI.*

## Construct Operationalization

### *Absorptive Capacity*

Based on existing literature on absorptive capacity and organizational innovation (e.g., Cohen and Levinthal 1990; Damanpour 1991), and the interview results with industry executives, we measured absorptive capacity as a formative, emergent construct formed from four subconstructs: preexisting related knowledge (*PRK*), managerial proclivity to change (*MPC*), aggressiveness of technology policy (*ATP*), and IT infrastructure sophistication (*ITI*).

As the definition of preexisting related knowledge implies, measures of this construct would always be context-specific (Fichman and Kemerer 1997). Hence, questions to gauge this construct were generated in the context of FEDI research covering the extent of (1) general IT knowledge of the senior management and the auditing and accounting staff, and (2) EDI implementation experience of the auditing, accounting, and IT staff. We tapped the knowledge level of multiple departments because the redundant knowledge possessed by people from different areas could enhance the absorptive capacity.

Managerial proclivity to change was assessed using Neal's (1965) battery of values that favored change. Modification was done because the psychometric properties of this three-item scale failed to meet desired levels. Considering the pervasive impact an IT innovation has on an organization (Keen 1991), we operationalized this construct by assessing senior managers' readiness to change the organization structure and interorganizational processes, and by assessing their beliefs on whether innovative staff should be handsomely rewarded and changes in environmental trends should be constantly monitored.

Questions on aggressiveness of technology strategy were drawn from Etlie (1983) and Grover (1993). We operationalized this construct at the cash management function level because FEDI is a technological innovation that would be most likely adopted by cash management. Hence, aggressiveness of technology strategy was measured by determining whether the cash management function spends more than others in the industry in acquiring new technologies, recruits personnel conversant with technologies, and keeps abreast of new technological developments in the banking sector.

EDI researchers have pointed out the importance of having strong underlying telecommunications infrastructure, and integrated databases for various application systems (e.g., Premkumar and Ramamurthy 1995; Swatman and Swatman 1992). Hence, questions on information technology infrastructure sophistication were adapted from Grover and from Premkumar and Ramamurthy to include these aspects.

### *Attitude Toward Using Focal Innovation*

Taylor and Todd (1995) suggested that attitudinal belief dimensions could be derived from the studies on the perceived characteristics of an innovation. Based on Rogers (1985) and Moore and Benbasat (1991), we measured attitude toward using focal innovation as a formative, emergent construct formed from three subconstructs: relative advantage (*ADV*), compatibility (*COM*), and complexity (*CPX*).

Relative advantage is the degree to which using an innovation provides more benefits than using its precursor (Rogers 1983). Drawing on the cash management literature (Baker 1991; Thierauf 1990), we operationalized this construct as improvements to the cash receipt, disbursement, planning, and forecasting processes, excess cash use, and financial image.

Compatibility represents the degree to which using the innovation is consistent with the existing organizational values, experiences, and needs (Rogers 1985). We altered Rogers' definition slightly to reflect the organizational context in generating the questions. Besides the organizational compatibility, technical compatibility is also covered as suggested by several researchers (Grover 1993; O'Callagan et al. 1992). Thus, compatibility was measured as the degree of consistency with existing IT infrastructure and data resources, organization objectives, and information systems objectives and policies.

Complexity refers to the degree to which understanding and operating an innovation is perceived to difficult (Rogers 1983). Adapting from Bouchard (1993), Dickerson and Gentry (1983), and Grover (1993), questions assessing difficulties in areas such as understanding and using FEDI from both a technical and a business perspective were used to operationalize complexity.

### **Adoption Intention**

The intention to perform a particular behavior has been suggested to be a reliable predictor of a person's actual behavior (Ajzen and Fishbein 1980). Since the primary objective of this study was to understand organizational innovation with information technology, organizational intention to adopt the focal technology was measured.

We operationalized intention to adopt FEDI as a reflective construct, incorporating the following essential elements of intention and behavior: actions (contemplating to adopt, likely to adopt), target (FEDI), context (organization), and time (within a year). Respondents were asked to indicate whether (1) they were contemplating adoption of FEDI and (2) they were likely to adopt it within a year.

### **Control Variables**

We included organization size, IT department size, and the existence of float management in the research model as control variables. The inclusion of control variables could address the suspicion that explanatory power of the theoretical variables is a spurious result of their covariation with some potentially significant variables. The primary potential confound to be controlled is related to size since organization size and IT department size serve as proxy for variables such as slack resources, professionalism, and education (DePietro et al. 1990) and may covary with the absorptive capacity and thus account for the variances in organizational IT adoption. The use of float management policy may also affect the perceived relative advantage and compatibility of FEDI and thus covary with organizational attitude to the technology. Hence, these three variables were captured and included to provide for greater quasi-experimental control.

Organization size was measured using the total number of employees of the organization. IT department size was gauged by the total number of IT personnel. Because their data were skewed, natural logarithms of the two variables were used in the data analyses. Existence of float management policy was determined by a binary variable indicating whether the organization practiced float management (1 = yes, 0 = no).

### **Data Collection**

The survey method was used because it provides a basis for establishing generalizability, allows replicability, and has statistical power. Extensive literature was reviewed to identify questionnaire items covering the domains of these constructs. Short interviews with 15 finance managers were conducted to assess their face validity followed by a process of conceptual validation. All items in the questionnaire were anchored on appropriately labeled 1 through 7 scales unless otherwise indicated. Samples were drawn from Dun and Bradstreet (Singapore), which lists the information of key businesses operating in Singapore.

A packet containing a cover letter stating the study objective, a copy of the questionnaire, and a prepaid reply envelope was sent to each CEO, CFO, and CIO of 1,021 organizations listed in the Dun and Bradstreet directory (Singapore) with complete information. The CEO, the CFO, and the CIO were selected because they are the key people making FEDI adoption decisions. Follow-up calls were made to increase the response rate. Additional packets were sent to respondents who had misplaced theirs. The response rates at the individual and organizational levels were 26.2 percent and 26.0 percent respectively. This response rate is considered reasonable because the survey was unsolicited and it involved senior management.

Among the 583 individual returns received, 35 questionnaires were discarded for providing unreliable data. The remaining 548 were segregated according to non-adopters and adopters of FEDI. Of all the returned and usable questionnaires, only responses from the 222 non-adopting organizations (160 CEOs, 177 CFOs, and 155 CIOs) were used for data analyses in order to have predictive value on adoption intention, and avoid the problem of respondent-recall and correlating today's variables with yesterday's innovativeness.

### **Data Analyses and Results**

Since absorptive capacity and adoption of information technology are both organizational phenomena, the responses from the CEO, CFO, and the CIO were aggregated within each organization for data analysis. Aggregation of responses can be justified

based on a theoretical basis (Langbein and Lichtman 1978). Meanwhile, an analysis of variance (ANOVA) was carried out on the dependent variable—organizational adoption intention—and no significant differences in the correlations between independent and dependent variables among the three groups of respondents were observed. Thus we are confident that the response aggregation did not introduce any bias.

A firm-level model was developed and executed to examine the effect of absorptive capacity on organizational predisposition toward FEDI. Structural equation modeling (SEM) was adopted for data analyses. LISREL was chosen to perform confirmatory factor analyses of the measurement items that capture the dimensions of the subconstructs. The confirmatory factor analyses provide a more rigorous assessment of the fit between the collected data and the theoretical factor structure (Bagozzi 1980).

PLS was selected for testing the structural model because it allows latent constructs to be modeled as either reflective or formative indicators. Reflective indicators *reflect* an unmeasured latent construct which is deemed to exist before it is measured, and are invoked to account for the observed variances and covariances. Formative indicators *form* a superordinate construct where the individual indicators are weighted according to their relative importance in forming the construct (Chin 1998; Law et al. 1998), and are also invoked to minimize residuals in the structural relationships. In this model, absorptive capacity and attitude toward using focal innovation were operationalized as formative, emergent constructs formed from first-order reflective subconstructs.

### ***Evaluating the Measurement Model***

Using LISREL 8.51, we performed confirmatory factor analyses of the seven multiple-items constructs. Unidimensionality and convergent validity ensures that all items measure a single underlying construct (Bagozzi and Fornell 1982). As shown in Table 1, all indicator loadings were close to the criterion of 0.707 and significant (Hair et al. 1998). The five indicators with a loading below 0.707 were significant, had no cross-loading problem, and did not minimize convergent validity and internal consistency. Thus they were retained. The model fit indices (Table 2) also provide adequate evidence of the unidimensionality of the items. All indices were quite close to their criterion level.

Cronbach's alpha, composite reliability, and the average variance extracted were computed to assess the internal consistency of each dimension (Hair et al. 1998). The results in Table 3 show that all Cronbach's alpha and composite reliabilities exceeded Nunnally's (1978) criterion of 0.7 while the average variances extracted for these constructs were above the recommended 0.5 (Hair et al. 1998), with ATP as the only exception whose average variance extracted is very close to 0.5. Discriminant validity reflects the extent to which the measures for each construct are distinctly different from each other (Anderson 1987). Table 4 provides strong evidence of discriminant validity as the  $\chi^2$ -value of the unconstrained model is significantly lower than that of the constrained model for all constructs.

### ***Testing the Structural Model***

PLS was used to test the hypotheses in the firm-level structural model. The significance of path coefficient and the  $R^2$  were estimated by a bootstrapping procedure with 250 random samples of size of 220. Hypotheses were assessed at 5 percent level of significance using one-tailed t-tests because of their unidirectional nature.

Figure 2 depicts the path coefficients and weights of the formative constructs and subconstructs respectively. Both the path linking the absorptive capacity with attitude and the one linking attitude with adoption intention are significant. A higher level of absorptive capacity leads to more positive attitudes toward using FEDI, which in turn results in stronger adoption intention. In contrast, the path directing absorptive capacity toward adoption intention is not significant. This suggests that absorptive capacity plays an influential role in determining the intent to adopt FEDI through attitude toward using FEDI. Organization size, IT department size, and existence of float management policy do not significantly impact adoption intention and attitude. Together with the control variables, absorptive capacity accounts for 20.0 percent of attitude variance, and attitude explains 29.6 percent of adoption intention. Overall, H2 and H3 were supported.

The results indicate that only preexisting related knowledge and aggressiveness of technology policy contributed to absorptive capacity's impact on attitudes toward using FEDI. Our conceptualization of managerial proclivity to change and IT infrastructure sophistication as dimensions of organizational absorptive capacity was not validated by the data. Similarly, compatibility and complexity contribute significantly to attitude's impact on adoption intention.

**Table 1. Operationalization of Multiple-Item Subconstructs: Evidence of Undimensionality**

Construct Items	Standardized Parameter Estimate	t-value
<b>PRK – Preexisting Related Knowledge</b>		
PRK1	0.73	11.88
PRK2	0.75	12.32
PRK3	0.75	12.15
PRK4	0.85	14.48
<b>MPC – Managerial Proclivity to Change</b>		
MPC1	0.79	13.62
MPC2	0.87	15.73
MPC3	0.88	16.06
MPC4	0.83	14.72
<b>ATP – Aggressiveness of Technology Policy</b>		
ATP1	0.68	9.87
ATP2	0.69	9.98
ATP3	0.74	10.90
<b>ITI – IT Infrastructure Sophistication</b>		
ITI1	0.67	10.66
ITI2	0.92	10.77
<b>ADV – Relative Advantage</b>		
ADV1	0.63	9.89
ADV2	0.78	13.07
ADV3	0.77	12.81
ADV4	0.62	9.77
ADV5	0.88	15.63
<b>COM – Compatibility</b>		
COM1	0.76	12.97
COM2	0.98	19.19
COM3	0.88	16.16
<b>CPX – Complexity</b>		
CPX1	0.96	18.21
CPX2	0.84	14.84
CPX3	0.77	13.16

**Table 2. Goodness of Fit Indices for the Measurement Model**

Goodness of Fit Indices	Model	Desired Levels
$\chi^2$	512.85 (p=0.00)	Smaller
df	322	-
$\chi^2/df$	1.59	<3.0
GFI	0.86	>.90
AGFI	0.82	>.80
Standardized RMR	0.062	<.05
RMSEA	0.052	.05-.08
NFI	0.86	>.90
CFI	0.94	>.90
IFI	0.94	>.90
Number of Latent Variables	8	-
Total Number of Items	27	-

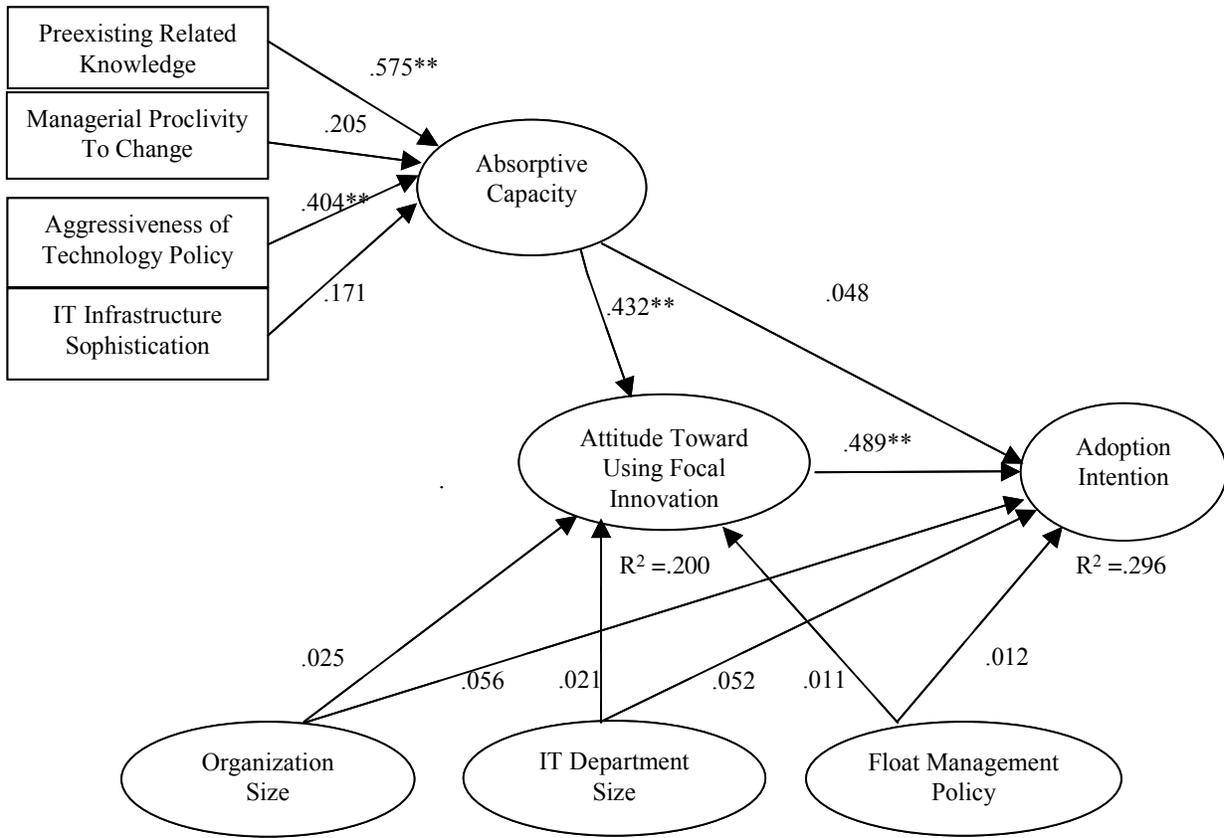
**Table 3. Assessment of Internal Consistency and Convergent Validity**

Dimensions	Number of Items	Cronbach's alpha	Composite Reliability	Average Variance Extracted
PRK	4	0.845	0.850	0.588
MPC	4	0.939	0.937	0.715
ATP	3	0.733	0.739	0.486
ITI	2	0.760	0.769	0.624
ADV	5	0.906	0.909	0.557
COM	3	0.933	0.946	0.815
CPX	3	0.892	0.894	0.740

**Table 4. Assessment of Discriminant Validity**

Dimensions	Constrained Model	Unconstrained Model	$\Delta\chi^2$
	$\chi^2(df)$	$\chi^2(df)$	
<b>PRK</b>			
MPC	400.90 (20)	35.03 (19)	365.87*
ATP	258.08 (20)	19.65 (19)	238.438*
ITI	82.72 (9)	14.62 (8)	68.1*
ADV	525.60 (27)	58.96 (26)	466.64*
COM	416.72 (14)	10.10 (13)	406.62*
CPX	390.04 (14)	25.60 (13)	364.44*
<b>MPC</b>			
ATP	216.38 (20)	32.38 (19)	184*
ITI	86.55 (9)	16.48 (8)	70.07*
ADV	653.70 (27)	44.55 (26)	609.15*
COM	648.56 (14)	19.87 (13)	628.69*
CPX	371.80 (14)	15.75 (13)	356.05*
<b>ATP</b>			
ITI	75.66 (9)	5.84 (8)	69.82*
ADV	256.43 (27)	24.08 (26)	232.35*
COM	250.99 (14)	10.44 (13)	240.55*
CPX	267.36 (14)	10.45 (13)	256.91*
<b>ITI</b>			
ADV	96.85 (14)	18.43 (13)	78.42*
COM	96.83 (5)	9.53 (4)	87.3*
CPX	87.62 (5)	6.71 (4)	80.91*
<b>ADV</b>			
COM	507.11 (20)	65.15 (19)	441.96*
CPX	407.14 (20)	35.62 (19)	371.52*
<b>COM</b>			
CPX	345.52 (9)	10.20 (8)	335.32*

All differences in  $\chi^2$  are significant at  $p < .05$ )



\*\*Significant at 5 percent level of significance

Figure 2. PLS Analyses Results

## Discussion

The goal of this study was to assess the causal pathway through which absorptive capacity impacts on organizational adoption intention toward an IT-based business-to-business linkage (FEDI), and to identify the organizational dimensions that contribute to its impact. In general, our empirical results provide strong support for the relevance of absorptive capacity construct in IT innovation adoption studies. Our study clearly demonstrates that absorptive capacity affects organizational adoption intention through shaping organizational decision-makers’ attitudes toward using an innovation. This finding, a significant departure from the body of literature on absorptive capacity in which a majority of the studies assume a direct causal relationship between absorptive capacity and adoption intention, calls for greater attention to be focused on how absorptive capacity actually influences an organization’s innovative behavior.

In line with studies on absorptive capacity (e.g., Cohen and Levinthal 1990), our findings indicate that preexisting related knowledge and technology policy contribute to absorptive capacity’s impact on decision-makers’ attitudes while IT infrastructure sophistication and managerial proclivity to change do not. One plausible explanation is that preexisting related knowledge and technology policy plays an active role in fostering an organization’s ability to appreciate, adopt, and implement an innovation while IT infrastructure sophistication and managerial proclivity to change act on organization’s absorptive capacity in a passive, second-order fashion.

Our study has some important implications. First, the finding that the attitudes held by key decision-makers play a significant role in influencing their adoption intention suggests that diffusion practitioners or vendors should attempt to understand these attitudes and how these attitudes are being shaped. Attitudes toward using an innovation, while often mentioned in individual

adoption of innovation, tend to be ignored when making organizational adoption decision (Fichman 2000). This study, however, suggests attitudinal variables are significant in the context of organizational IT adoption as well. Second, it would appear that diffusion practitioners stand a better chance of inducing organizational adoption of their innovation if they could identify, through field visits and surveys, organizations that have high preexisting related knowledge to the focal innovation and an aggressive technology policy. Decision-makers in these organizations are more likely to have receptive attitudes toward using the innovation, compared to those that are lacking in them. Where resources permit, diffusion practitioners should also help organizations improve their preexisting related knowledge base, because doing so may help that innovation diffuse much quicker. Indeed, this role is particularly important because the two most significant indicators contributing to decision-makers' attitude toward using that innovation is its compatibility and complexity.

Caution, however, should be exercised when interpreting these findings because the nature of this study may reduce the generalizability of its findings to other economic and cultural environments. Replication of this study in other contexts would be extremely useful to validating the role of absorptive capacity in organizational adoption of innovation, especially the causal pathway through which it affects adoption intention. Additionally, other variables such as the institutional variables in the environment, or other organizational characteristics such as its structure and its degree of formalization could be included to increase the variance in the dependent variables. In this study, we included only variables that could be subject to managerial intervention.

## Conclusions

This study contributes to understanding the profile of potential adopters that may be more inclined to adopt IT-based business-to-business linkages. It reaffirms the critical roles preexisting related knowledge and technology policy play in influencing an organization's ability to appreciate, adopt, and implement an innovation (Fichman and Kemerer 1997). It also adds to the theory of absorptive capacity (Cohen and Levinthal 1990, 1994) by showing that an organization's absorptive capacity impact on its innovative behavior is mediated by the key decision-makers' attitudes toward using the innovation. Overall, our findings suggest that diffusion practitioners should pay heed to key decision-makers' attitudes toward the innovation, and attempt to understand how these attitudes are shaped by organizational characteristics.

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