NORTHERN ARIZONA UNIVERSITY
The W. A. Franke College of Business

Reseller Adoption of Manufacturers' E-Business Tools:
The Impact of Social Enforcement, Technology-Relationship Fit and the Mediating Role of Reseller Benefits
Working Paper Series—08-16 | October 2008

Talai Osmonbekov

Northern Arizona University
The W. A. Franke College of Business
Flagstaff, AZ 86011
928-523-7365
Talaibek.Osmonbekov@nau.edu

October 13, 2008

Reseller Adoption of Manufacturers' E-Business Tools: the Impact of Social Enforcement, Technology-Relationship Fit and the Mediating Role of Reseller Benefits

Introduction

When Renault wanted to share information with its network of more than 14000 dealers in Europe they turned to Oracle's Siebel brand of Partner Relationship Management (PRM) software. Using this web-based software Renault was able to streamline its communications with dealerships, improve dealer sales lead-conversion rates by 30 percent for new cars and by 25 percent for used cars, and become more responsive to customer requests via web-site by following through with emails to dealers in the customer's area. In addition, Renault was able to provide the dealerships with automated self-service 24/7 technical support for dealers, and standardize business processes across its dealer network (Oracle 2006). As this example illustrates, manufacturer-reseller relationships are undergoing a dramatic transformation as manufacturers attempt to capitalize on the proliferation of web-based business software, commonly referred to as e-business tools (Wu et al. 2003). The proliferation of similar web-based software packages has been surveyed in previous research (Lee et al. 2005; Bello et al. 2002; Mirani et al. 2001). These studies suggest that information exchange between channel members may be becoming more sophisticated than e-mail and less expensive than traditional Electronic Data Interchange (EDI) systems. While the PRM benefits to manufacturers are well understood, there is little understanding on what drives the adoption of PRM and related tools by the downstream channel partners.

Extant marketing research examines various antecedents of e-business adoption by a firm. For example, Srinivasan et al. (2002) study technological opportunism, institutional pressures and ownership of complementary assets and Wu et al. (2003) examine firm characteristics, customer power and normative pressures. However, e-business adoption has not been studied in the channel context, nor have supplier relationship variables been posited to influence e-business adoption by a firm. For instance, in the Wu et al. (2003) study only half an item is devoted to the influence of suppliers on the e-business adoption by a firm. The relational context in which the firms make e-business adoption decisions is very important, as e-business tools are becoming a de-facto *inter*organizational information sharing, communication and payment system in the channels of distribution. O'Callaghan et al. (1992, p. 45), in the context of EDI systems, note: "Interorganizational systems employing information technology may be the most important technological breakthrough in channels of distribution since air transport." Given the superiority of e-business tools to traditional EDI in terms of cost, flexibility and openness, the dearth of empirical research on e-business in the channels context is surprising. Additionally, there are no previous marketing studies on e-business adoption that examine the mediating role of a firm's perceived benefits from technology, although information science literature paradigms suggest that technology usefulness is one of the primary drivers of adoption in an organizational setting (Venkatesh et al. 2003).

This research attempts to contribute to the emerging literature on e-business technology (Srinivasan et al. 2002; Wu et al. 2003) by extending the governance theory (Heide 1994; Heide and John 1992) into the domain of technology adoption in buyer-seller relationships. The study develops and tests a theoretical model by drawing from marketing and information science literatures as well as insights gained from in-depth interviews with managers at reseller firms. First, we examine e-business adoption in the channel context by incorporating social enforcement and relationship-technology fit as important factors contributing to reseller adoption of manufacturer's e-business tools. Second, we develop measures for reseller e-business adoption in demand and supply activities as well as reseller sales force and ordering benefits. Third, drawing from information science literature we examine the mediating role of reseller benefits, which has not been examined the in marketing literature.
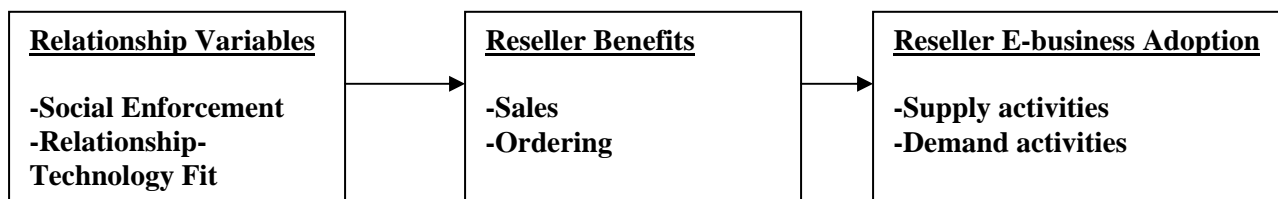
E-business Adoption by Resellers

For the purposes of this research, e-business adoption is defined as the extent to which a reseller uses e-business tools on a manufacturer's web site in its interactions with that manufacturer. Demand activities are intended to stimulate orders for the manufacturer's products. They cover promotions that are often performed by both reseller and manufacturer and thus constitute a relationship connector between them. Another such connector is activities intended to ensure adequate supply of manufacturer's products to end users. These supply-fulfillment activities include logistical and supply management activities. This fundamental separation between activities has been reflected in the discussions of Supply Chain Management (SCM) and Demand Chain Management (DCM) concepts by Frohlich and Westbrook (2002) and Hekkila (2002), among others. SCM emphasizes total cost reduction or efficiency aspect in the interorganizational chain, whereas DCM focuses on the customer satisfaction and improvements in demand generation and monitoring. These activities can be handled using traditional methods (i.e. telephone, fax, mail, EDI), but e-business tools can potentially streamline both categories of channel activities (Frohlich and Westbrook, 2002).

One of the interesting aspects of e-business tools in the channel context is that it is a shared resource (Boyd and Spekman, 2004), because it is implemented and owned by a manufacturer but is also used by the channel members. Therefore, e-business tools are unlikely to create switching costs for resellers because they are not invested in those tools. Web-based tools reduce transactions costs, but are not likely to be viewed as a transaction specific investment that ties resellers to a particular manufacturer, as the tools could be used by any reseller. The only investment on the reseller side is the time and effort involved in learning to use the tools. However, our depth interviews with reseller managers revealed that this is not a particular concern for resellers because the tools are generally easy to use and similar across manufacturers. So, we concluded that learning costs are negligible in this situation. Additionally, channel research generally views power-dependence relationships between channel members as an antecedent condition to the emergence of a particular type of governance (Heide 1994). As discussed in the next section, we focus on the bilateral governance process of social enforcement as a predictor of e-business adoption by resellers.

Theoretical Model and Hypotheses

We developed the model (Figure 1) by combining insights from our depth interviews and examination of channels and information science research. The model reflects our thesis that resellers are more likely to adopt e-business tools if they perceive benefits for themselves and their perceptions of benefits are impacted by the relationship with the manufacturer, both in terms of technology and the social enforcement of the relationship.

Figure 1. Relationships Variables, Reseller Benefits and E-business Adoption

Relationship Variables -Social Enforcement -Relationship- Technology Fit	→	**Reseller Benefits** -Sales -Ordering	→	**Reseller E-business Adoption** -Supply activities -Demand activities

Social Enforcement

Social enforcement is defined as the extent to which parties' shared expectations and norms serve as an enforcement mechanism in a manufacturer-reseller relationship. According to Heide (1994), firms may establish and share common values that direct their behaviors in a certain way. Such common values are often referred to as 'relational norms' (Heide and John 1992) and may be indicative of bilateral governance in a relationship. Heide (1994) notes that market and bilateral means of enforcement may be similar as they "are designed to achieve compliance by means of making certain behaviors desirable or undesirable…" (p. 78). Social enforcement, as a bilateral means of enforcement, also could be described as self-enforcement because parties in the relationship are relying on existing social norms to guide their behavior.

Social enforcement may be a catalyst to reseller's adoption of the manufacturer's e-business tools, as they have shared expectations about improving and streamlining their business relationship. These shared norms guide reseller's adoption of manufacturer's e-business tools, as it is understood that it is a desirable type of behavior in this relationship. Additionally, if a reseller values its relationship with a manufacturer it is more willing to adopt manufacturer's new initiatives such as the roll out of manufacturer's e-business tools. Overall, if resellers think that they have a good working relationship with a manufacturer, evidenced by the existence of social enforcement, they are more likely to use e-business tools provided by that manufacturer. Thus, the following hypothesis is proposed:

H1a. Social enforcement is positively related to e-business adoption by reseller.

Relationship-Technology Fit

Manufacturer-reseller relationships may take various forms based on a variety of factors. For instance, Cannon and Perreault (1999) identify eight different types of business-to-business relationships based on six different relationship connectors. The universe of business-to-business relationships is diverse and complex with varying degrees of information exchange, operational linkages, legal bonds, cooperative norms and adaptations by the parties (Cannon and Perreault 1999). In addition to Cannon and Perreault's (1999) classification, there are other classifications of business relationships (Heide 1994; Dwyer et al. 1987). It would be too simplistic to assume that e-business tools in each of the different business relationships would operate similarly. Therefore, it is important to know how e-business tools fit into the existing manufacturer-reseller relationship.

Relationship-technology fit is defined as the extent to which the e-business tools are consistent with the current interactions between the organizations. Adapted from the concept of job fit (Speier and Venkatesh, 2002) and the compatibility factor in innovation diffusion literature (Rogers, 1995), this construct is designed to capture the interorganizational dynamics of using e-business tools by a reseller in its interactions with a manufacturer. Specifically, it is designed to measure the extent to which e-business tools fit into the existing pattern of interaction between the manufacturer and reseller. To illustrate, in our depth interviews we observed a high variance in the type of interactions that reseller firms have with manufacturers. One manager described his relationship as very personal, where he interacts only with a certain person on the manufacturer's side, they share family news, jokes, and do business as well. Another manager's interactions are not as personal; when he calls he always gets different people with differing levels of expertise, knowledge about his business, etc. The latter relationship has a better technology-relationship fit, as their existing interactions are as impersonal as interacting through e-business tools. Therefore, we propose the following hypothesis:

H1b. Relationship-technology fit is positively related to e-business adoption by reseller.

Reseller Benefits

The introduction of e-business tools in manufacturer-reseller relationships may also benefit resellers. Two types of benefits examined here are sales force benefits and ordering benefits.

Sales Force Benefits. Sales force automation (SFA) potential benefits and drawbacks have been examined in previous research in marketing (Bush et al. 2007; Honeycutt 2005; Johnson and Bharadwaj 2005; Speier and Venkatesh 2002; Engle and Barnes 2000; Hill and Swenson 1994). One of the primary benefits perceived by reseller organizations is the increased efficiency of the sales force. SFA tools are accessible through web sites for the manufacturer's salespeople as well as for resellers' sales personnel. This serves as a relatively inexpensive alternative to EDI systems (Soliman and Janz 2003). The informational tools, product configuration tools, and ability to download collateral and templates for product presentations from the manufacturer's web site helps the reseller sales force to be more efficient (Hunter et al. 2004). Many manufacturers offer online sales force training, making resellers more flexible in terms of not requiring their sales force to physically travel to sales seminars, potentially increasing valuable face time with customers. Our depth interviews with resellers revealed that many resellers are taking advantage of these opportunities that are made available through manufacturer's web sites.

Ordering Benefits. Many business processes could become more efficient with the use of e-business tools. For example, digital document storage and management is much more efficient than paper document storage and management. In our depth interviews, managers pointed out similar efficiencies in the most common interorganizational process they are involved in with a manufacturer: the ordering process. Ordering benefits are defined as the increased efficiency of ordering and ordering related activities. These include direct expenditure of time in filling out and faxing or telephoning an order to the manufacturer as well as the cost of actually transmitting the order to the manufacturer (Hunter et al. 2004). With the advent of online ordering, online submission is cost-free and completing an order online is a familiar and easy process, especially with features such as saving a typical order and ability to resubmit an old, filled-out order as a new one with minor changes.

The reseller benefits from e-business adoption are inextricably linked with the relationship that the reseller has with a particular manufacturer. As noted above, manufacturers attempt to achieve certain operational and marketing benefits by implementing e-business tools with their resellers. If a reseller perceives that a focal relationship is based on honesty and mutually shared goals and expectations, the reseller is more likely to perceive that the e-business tools implemented by the manufacturer are likely to benefit the reseller as well. In contrast, if the reseller thinks that there are no social norms in this relationship, the reseller will likely perceive that e-business tools will only benefit the manufacturer. Resellers' perceptions are important here since the design, implementation and customization of e-business tools are fully under control of the manufacturer, as the owner of this shared resource. Thus:

H2a. Social enforcement is positively related to reseller benefits from e-business adoption.

Concurrently, e-business tools need to be compatible with the existing relationship with the manufacturer so that the benefits from e-business adoption outweigh the costs of learning to operate the new system of interactions. This would suggest that the attainment of benefits is dependent on the overall state of the relationship as well as the matching of the e-tools with the pattern of interaction between the parties. For instance, if the parties do not have shared values a reseller may not perceive e-business tools as being able to provide benefits for itself, but perhaps only for the manufacturer. Similarly, if the reseller does not perceive that the e-business tools are consistent with the existing interactions with the manufacturer, the reseller may not see the potential benefits, but only the costs of learning how to use the new e-business tools. Hence, the following hypothesis is advanced:

H2b. Relationship-technology fit is positively related to reseller benefits from e-business adoption.

Mediating Role of Reseller Benefits

A closer examination of reseller benefits in the manufacturer-reseller relationship may help to lead to a clearer explanation of e-business adoption by the reseller. Information science research suggests that the usefulness of information systems usually intervenes between organizational, personal or technology specific variables and the actual use of the system (see Venkatesh et al. 2003 for a comprehensive review). For instance, Karahanna and Straub (1989) posit that the impact of such variables as social presence and social influence is mediated by a perceived usefulness variable in the context of use of an email system. Empirical evidence that a similar pattern of mediation may hold true in the interorganizational setting is scarce. For example, O'Callaghan et al. (1992), studying EDI adoption, found direct effects between the expected benefits of a system and the decision to adopt, but found no support for the hypothesized link between supplier influence and reseller's decision to adopt. We believe the explanation is in the mediated pattern of effects, i.e. the reseller's perceived benefits of technology intervene between relationship variables and technology adoption. Although resellers may value their relationships with manufacturers, ultimately their self-interest as independent economic entities is a higher priority and their perceptions of their own benefits, either sales or ordering, from e-business tools will play a major role in their decisions to use manufacturer's e-business tools. Therefore, the following hypothesis is advanced:

H3. Reseller benefits mediate the link between relationship variables (social enforcement and relationship-technology fit) and e-business adoption by reseller.

Methodology

Data Collection

Pilot Study and Field Interviews. As noted earlier, the empirical test is focused on the perspective of a reseller at the e-business adoption process. First, we examined the software companies and products that are focused on providing e-business tools to a channel. We visited several software firms, studied the functionality of their packages, and participated in demonstrations of their products. We felt this was an important step, as these companies (e.g. Siebel Systems) conduct research in manufacturer-reseller interactions in order to produce appropriate tools. Next, a pilot study was conducted with 25 purchasing and marketing managers of value added resellers (VAR) in the computer and network equipment industry. There was sufficient diffusion of e-business tools in manufacturer-reseller interactions as well as variance among the resellers in using them to warrant an extended study. A series of 28 field interviews were then conducted with VAR's marketing and purchasing managers responsible for direct dealings with the manufacturers. The interviewees provided insights and feedback on the questionnaire items as well as reflected on how e-business tools may be changing their interactions with manufacturers. Field work provided support for using key informants as persons interviewed had a working knowledge about using e-business tools in their interactions with the manufacturers.

Measures. The scales (see Table 1) were adopted and adapted where appropriate from previous studies. For instance, measures for social enforcement were derived from Heide's (1994) conceptualization of mutuality of interest enforcement mechanism and adopted from previous empirical research in distribution channels (Gilliland 1997). Technology-relationship fit was adapted from the measures of job fit (Speier and Venkatesh 2003) and made more appropriate to a relationship setting while maintaining consistency with Rogers (1995) conceptualization of compatibility. The scales for sales and ordering benefits and e-business adoption in supply and demand activities were conceptualized and developed for this study following the general guidelines provided by Churchill (1979). The results of our software package examination, pilot study and field interviews were used as inputs for developing scales for reseller benefits and e-business adoption in supply and demand activities. We measured e-business adoption on a continuous scale, as we realize that resellers could use e-business tools to perform

all of their activities dealing with the manufacturer or only some of them, as they choose to complete some offline, or based on the availability of only certain e-business tools. We developed a pretest questionnaire and posted it on a password protected web-site. A pretest was then conducted using a fresh sample of reseller representatives (N=29). After collecting the results of the pretest, we followed up with the respondents with clarification questions that enabled us to purify our scales and reduce the number of items to a manageable pool. The final questionnaire instrument was also posted on a password protected web site.

Final Sample. The sampling frame was 2 lists purchased from publishers of trade journals and other business information. Computer and computer network components resellers were selected for this study because this industry is more likely to employ and understand e-business tools than other industries and it has a large impact on the economy. For the main study, a list of 4342 names of executives from computer integrator and VAR companies (SIC 7373) was used. After the removal of duplicates, firms that had gone out of business, merged companies, misclassified companies etc., the usable list was reduced to approximately 1700. Executives were contacted by phone and qualified to ensure that their company was in computer and network components resell business and were using e-business tools with the manufacturers of these products. The respondent's e-mail address was obtained and each was sent a link to the web survey with the appropriate instructions and a respondent password.

A total of 614 prospects qualified for the study and agreed to receive an email containing a link to the survey. 224 responses were received constituting a response rate of a little over 36%. This compares well to around 20% response rate in similar studies. Overall, the final sample of resellers had a fairly long relationship with the manufacturers (mean of 9.2 years). The share of the focal manufacturer in the reseller's business averaged 36% of sales. The share of the overall manufacturer-reseller interaction accounted for by the Web is almost 36% of all interactions, indicating the importance of Internet tools in manufacturer-reseller relationships.

We assessed the impact of non-response bias, using a method by Armstrong and Overton (1977). We considered first 25 percent of respondents as early and last 25 percent as late respondents. The means of six constructs of the study were compared between the two groups and no statistically significant differences were found, suggesting that nonresponse bias is not significantly affecting the results of the study.

Several procedures suggested by Podsakoff et al. 2003, were implemented to address common method bias in executing the study. Predictor and independent variables were located on different pages (screens) of the online questionnaire, thus providing for a certain level of psychological separation between them. We also guaranteed response anonymity. Finally, standard one factor method was used to examine for common method variance and it was concluded that common method problems were insignificant.

Data Analysis and Results

The data analysis followed a standard procedure in structural equation modeling recommended by Anderson and Gerbing (1988). First, a confirmatory factor analysis with the 20 measures statistically assessing the discriminant and convergent validity of 6 constructs in question was employed using Lisrel 8.54 (Joreskog and Sorbom 1996). Means, standard deviations, and correlations among constructs are provided in Table 2. The parameters were estimated using the maximum likelihood estimation technique. The results demonstrate that the measurement model provides a reasonable fit for the data. Positive diagnostics of the model include Chi-square of 235.03 with 155 df, a goodness of fit index (GFI) of .90, comparative fit index (CFI) of .99, a parsimony normed fit index of (PNFI) of .79, and a non-normed fit index (NNFI) of .99. The root mean square error of approximation (RMSEA) is .048. The measures demonstrated adequate reliability (Hair et al. 2006) since composite scale reliabilities (ρ) ranged from .85 to .94 and variance extracted (VE) ranged from .63 to .84 (See Table 1). Face validity was examined by 2 professors and 1 doctoral student who judged the consistency between theoretical definitions of constructs and their respective measurement items. In the pretest stage, 2 items for supply, 3 items for demand, 5 items for sales, and 4 items for ordering were eliminated, as they demonstrated low test-retest

reliability. Convergent validity was evidenced by the large significant loadings (t-values > 2) of all the 20 items on their latent constructs; discriminant validity was indicated since the confidence interval (+/- two standard errors) around the correlation estimate between any two latent constructs included 1.0 (Anderson and Gerbing, 1988, p. 416).

Table 1. Measurement Items (7-point, anchored by "Strongly Disagree" and "Strongly Agree")

Social Enforcement (ρ=.85, VE=.65)	Mean	SD	Loading
For both parties in this relationship it is expected that…			
We keep our promises to each other because we value our partnership	5.55	1.49	0.78
Our shared expectations serve to enforce our business agreements	5.29	1.49	0.83
The strength of our relationship will keep the parties honest in dealing with each other	5.26	1.59	0.80
Relationship-Technology Fit (ρ=.89, VE=.74)			
Online tools fit well with our existing relationship with this manufacturer	5.23	1.44	0.84
Online tools match the type of activities we are engaged in with this manufacturer	5.18	1.51	0.93
Online tools complement our existing modes of interaction with this manufacturer	5.26	1.47	0.80
Sales Force Benefits (ρ=.87, VE=.63)			
With e-business tools we…			
Reduce our sales force down time	4.37	1.90	0.74
Reduce our administrative expenses	4.43	1.82	0.72
Increase our sales force efficiency	4.82	1.76	0.86
Increase our sales force responsiveness to customers	5.03	1.78	0.84
Ordering Benefits (ρ=.94, VE=.84)			
With e-business tools we…			
Reduce time of order submission to this manufacturer	4.55	2.02	0.92
Reduce our costs of order submission	4.33	1.99	0.91
Make our ordering process more efficient	4.55	2.01	0.92
E-business Adoption in Demand Activities (ρ=.88, VE=.66)			
We use E-Business tools provided by this manufacturer in…			
Marketing activities with this manufacturer	4.03	1.96	0.71
Promotional activities with this manufacturer	4.14	1.97	0.78
Market development activities with this manufacturer	3.67	1.93	0.89
Advertising activities with this manufacturer	3.60	1.97	0.85
E-business Adoption in Supply Activities (ρ=.87, VE=.69)			
We use E-Business tools provided by this manufacturer in…			
Order fulfillment activities with this manufacturer	4.16	2.32	0.79
Order processing activities with this manufacturer	4.17	2.30	0.92
Physical distribution activities with this manufacturer	3.80	2.19	0.77

Table 2. Means, Standard Deviations, and Correlations

	Mean	Standard Deviation	1	2	3	4	5	6
1. Social Enforcement	5.38	1.40						
2. Relationship Technology Fit	5.22	1.40	.11					
3. Sales Force Benefits	4.67	1.67	.25**	.52**				
4. Ordering Benefits	4.47	1.95	.20**	.48**	.62**			
5. e-business Adoption in Demand Activities	3.86	1.82	.19**	.24**	.49**	.28**		
6. e-business Adoption in Supply Activities	4.04	2.15	.35**	.35**	.48**	.66**	.47**	

**. Correlation is significant at the 0.01 level (2-tailed).
N=224

After checking the appropriate metrics and performing additional analysis per Hair et al. (2006), we came to the conclusion that multicollinearity was not a concern in our data. The standard errors are fairly small (not inflated), estimates did not change radically when we excluded some variables, and simple correlations were not greater than .7. Additionally, none of the eigenvalues approached zero and Variance Inflation Factors (VIFs) were within appropriate range.

After verifying that confirmatory factor analysis model diagnostics were acceptable, we proceeded to the second step: structural models specification and testing. The results of the first test are described in Table 3 (direct model). This model was designed to test H1 positing that both social enforcement and relationship fit positively relate to e-business adoption. The chi-square for this model is 447.24 with 161 degrees of freedom, GFI is .83, CFI is .97, PNFI is .80, NNFI is .96, and RMSEA is .090. All the structural paths in the model were significant and in the expected positive direction. For instance, both paths from social enforcement to reseller e-business adoption variables were significant (t=3.47 and t=3.16) and have moderate associations (SE=.30 and SE=.28). Relationship fit was significantly associated with e-business adoption in demand activities (t=3.35 SE=.32) and e-business adoption in supply activities (t=5.45, SE=.54). These results provide support for H1 which posited association among relationship variables and reseller e-business adoption.

The second test was of the theoretical model with the perceived benefit variables mediating the impact of the relationship variables on e-business adoption variables. Overall the theoretical model fits the data well. The chi-square is 323.97 with 161 degrees of freedom, GFI is .88, CFI is .98, PNFI is .82, NNFI is .98, and RMSEA is .065. All the structural paths except one were significant and in the direction expected. Social enforcement positively influenced perceived sales benefits (t=3.10) as well as perceived ordering benefits (t=2.58) equally (SEs=.21). Relationship fit significantly (t=8.36) and strongly (SE=.67) affected perceived sales benefits and its effect on perceived ordering benefits was even stronger (SE=.74) and significant (t=7.94). These findings suggest support for H2, which posited associations among the relationship variables and reseller benefits. The path from perceived ordering benefits to e-business adoption in demand activities was insignificant.

Table 3: Structural Models Statistics and Unstandardized Path Coefficients

| Measure	Direct	Indirect	Saturated
χ^2	447.24	323.97	315.40
Df	161	161	157
Social Enforcement $\rightarrow$ Perceived Sales Benefits	.22**	.21**	.21**
Social Enforcement $\rightarrow$ Perceived Ordering Benefits	.22**	.21**	.21*
Social Enforcement $\rightarrow$ e-business Adoption in Demand	.31***		.18*
Social Enforcement $\rightarrow$ e-business Adoption in Supply	.29***		.13
Relationship-Technology Fit $\rightarrow$ Perceived Sales Benefits	.69***	.67***	.67***
Relationship-Technology Fit $\rightarrow$ Perceived Ordering Benefits	.76***	.74***	.74***
Relationship-Technology Fit $\rightarrow$ e-business Adoption in Demand	.35***		-.07
Relationship-Technology Fit $\rightarrow$ e-business Adoption in Supply	.58***		0.03
Perceived Sales Benefits $\rightarrow$ e-business Adoption in Demand		.60***	.59***
Perceived Sales Benefits $\rightarrow$ e-business Adoption in Supply		.13*	.10
Perceived Ordering Benefits $\rightarrow$ e-business Adoption in Demand		-.01	-.01
Perceived Ordering Benefits $\rightarrow$ e-business Adoption in Supply		.62***	.61***

[*] $p<.05$. **$p<.01$. ***$p<.001$

Testing for Mediation

We conducted mediational analysis using LISREL following the procedures described in prior research (Mayer and Davis, 1999; Sapienza and Korsgaard 1996) that are based on Baron and Kenny's (1986) general principles. The procedures compare alternative models in terms of their fit indices as well as path coefficients. The results of the procedures are illustrated in Table 3. We compared three different models: a direct model, an indirect model and saturated model. We can compare only nested models (Sapienza and Korsgaard 1996) so we can make only 2 comparisons. When we compared the direct model and the saturated model the chi-square difference of 131.84 with 4 degrees of freedom was significant ($p<.001$). This indicates the impact of relationship variables on e-business adoption was mediated by reseller benefits. The comparison between the indirect model and saturated model provided a chi-square difference of 8.57 with 4 degrees of freedom (*ns*). This insignificance suggests that the more complex saturated model did not improve the fit in comparison with simpler, more parsimonious indirect model. This is consistent with the Occam's razor and the principle of parsimony, therefore we can conclude that our theoretical model is superior (see Figure 2).

To complete the mediational analysis it was necessary to examine the individual structural path estimates in the saturated model. None of the direct paths from relationship-technology fit to e-business adoption variables was significant, while its links with perceived reseller benefits remained significant ($p<.001$). The path from social enforcement to e-business adoption in supply was insignificant but the path to e-business adoption in demand was significant ($p<.05$). All the paths from social enforcement to reseller benefits were significant ($p<.005$). The paths from sales benefits to e-business adoption in demand and from ordering benefits to e-business adoption in supply were significant (both at $p<.001$), while sales benefits did not significantly affect adoption in supply nor did ordering benefits significantly affect adoption in demand.

Figure 2. Saturated mediation model of relationship variables on reseller e-business adoption.*
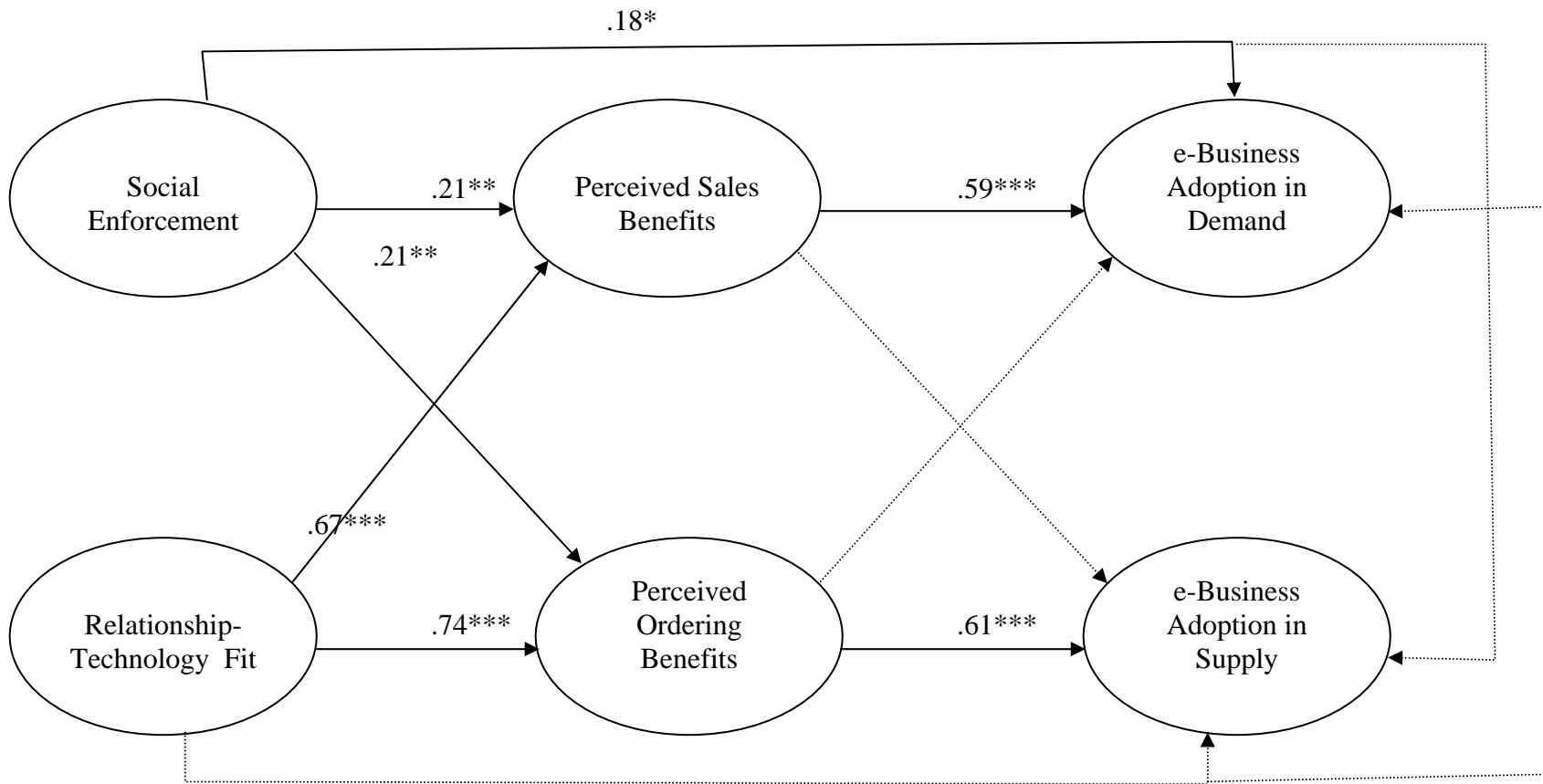
Note: Dotted arrows represent insignificant paths and solid lines represent significant paths. p<.05. **p<.01. ***p<

The results of chi-square difference tests and examination of structural paths suggest the link between relationship-technology fit and e-business adoption was fully mediated by reseller benefits. On the other hand, the relationship between social enforcement and e-business adoption was partially mediated by reseller benefits. Social enforcement impacts e-business adoption in supply only indirectly through reseller benefits and impacts e-business adoption in demand both directly and indirectly. Thus, the results of our mediational analysis provide partial support for H3 proposing that the impact of relationship variables on e-business adoption would be mediated by reseller benefits.

Discussion

The main purpose of the present study was to examine e-business adoption in the channel context by incorporating relevant relationship variables of social enforcement and technology relationship fit. In general, our findings support our thesis that both variables are important in determining the e-business adoption of manufacturer's e-tools by resellers. We find that social enforcement and technology relationship fit affect the perceptions of resellers about the benefits from e-tools, and perceptions of these benefits affect their e-business adoption. This finding provides support for the general notion that new, technology enabled business processes and procedures do not function in isolation from 'old' organizational variables (Jap and Haruvy 2008). It also underscores the importance of developing strong relationships with the channel members, as it affects their technology adoption decisions. Future research should examine other relationship variables, such as trust and commitment, various governance processes (Heide 1994) as antecedents to adoption of technology by the downstream channel partners. Additionally, our understanding of technology adoption within the channel context could be enriched if traditional adoption variables of relative advantage, compatibility etc., could be included in the model. It would be interesting to compare the explanatory power of the traditional adoption variables with that of the relationship variables.[1]

The study develops and validates the scales to measure the perceived sales force and ordering benefits that could be used in future research. Previous research has suggested that these particular channel processes be streamlined with the advent of e-business tools, and this study provides empirical evidence of such effect. We find that these perceived benefits drive the adoption of PRM tools. Future research could expand the list of the benefits by adding other interorganizational processes, such as logistics and even negotiation and execution tasks (Boyd and Spekman 2004), as well as various promotional, including co-op advertising, planning joint trade show booths, etc. All these interorganizational processes are well within the scope of modern PRM technologies.

We also find that relationship-technology fit construct's impact on e-business adoption is fully mediated by the reseller benefit variables. This finding suggests that reseller benefits from e-business adoption play an intervening role between how well the technology fits a given relationship and resellers actual deployment of that technology. The impact of social enforcement on e-business adoption in supply activities is also fully mediated by reseller sales and ordering benefits. Again, this underscores the importance of the relational aspects of adoption of technology. If a relationship is not well suited to the technology, resellers are not likely to derive any benefits from it and therefore may not use it, no matter how sophisticated that technology may be. This suggests that a match between a relationship and technology may be an important consideration in the channel context. Future research should try to replicate our findings and possibly expand upon them by including other fit variables such as technology-firm fit, which could be used as a control variable. Some firms may have technophobe cultures that make them extra-resistant to using modern technology.

A more surprising finding is that social enforcement also directly impacts on e-business adoption in demand activities. We find that it affects e-business adoption in demand activities both directly and indirectly through sales benefits. Social enforcement is by definition a bilateral norm (Heide 1994) and parties in bilateral relationships tend to change their behavior for the sake of the relationship even in the

---

[1] We thank an anonymous reviewer for this valuable idea.

absence of short-term gains for the individual party. But why doesn't social enforcement impact e-business adoption by reseller in supply activities? One possible explanation is that demand generation may require more interactions between manufacturer and reseller to coordinate various promotional and marketing activities. As manufacturers and resellers try to coordinate the timing and extent of joint marketing activities, it becomes a major part of their relationship. On the other hand, for supply activities, resellers often have large distributors as an alternative to deliver the same manufacturers' products to end customers, therefore making supply activities less important for the focal relationship with the manufacturer. Future research could explore this explanation by utilizing a network analysis approach to the study of e-business adoption in the channel of distribution by including a distributor-reseller relationship in the analysis.

Managerial Implications

This research reaffirms the importance of developing strong business relationships with downstream channel partners. This study demonstrates that the relationship norms lead to the realization of the benefits from technology adoption, and affect both directly and indirectly the actual adoption of technology by the downstream partner. Resistance to change, especially resistance to introduction of new technology in business relationships could be a strong force that could make or break the deployment of PRM technology. Our research suggests that cultivation of good relationships can help the manufacturers to overcome such resistance from the reseller firms.

As manufacturers attempt to migrate their resellers to online interfaces they should consider segmenting resellers based on their perceptions of the benefits that the *resellers* may derive from such migration. If a group of resellers perceive high benefits in the areas of their sales force and ordering efficiencies, they are very likely to complete the transition without additional incentives from the manufacturer. Additional segmentation bases may include whether the type of interactions with resellers is suitable to the migration to an online platform, as well as the existence of social enforcement in relationships. Manufacturers may consider fostering social enforcement mechanism in their reseller relationships since it impacts resellers' adoption of e-business tools, both directly and indirectly through perceptions of benefits.

For supplier firms of e-business tools, the results of the study suggest a slight change to their current marketing strategy. Currently, the software companies market their e-business packages designed for channel management, directly to the big manufacturers emphasizing the benefits that the *manufacturer* will derive. The suppliers may complement such sales pitches by informing the manufacturers about various benefits that the *resellers* will be deriving from e-business tools because ultimately, e-business adoption is driven by both sides of a channel dyad. Consequently, the design and upgrades to the software should be made with the interest of the both sides in mind.

References

Anderson, James C., and David W. Gerbing (1988), "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," *Psychological Bulletin,* 103(3), 411-23.

Armstrong, Scott J. and Terry S. Overton (1977), "Estimating Nonresponse Bias in Mail Surveys," *Journal of Marketing Research,* 14, 396-402.

Baron, Reuben M., & Kenny, David A. (1986), "The moderator-mediator variable distinction in social psychology research: Conceptual, strategic, and statistical considerations," *Journal of Personality and Social Psychology,* 51*,* 1173-1182.

Bello, Daniel C., Talai Osmonbekov, "Frank" Tian Xie, and David I. Gilliland (2002), "e-Business Technological Innovations: Impact on Channel Processes and Structure," *Journal of Marketing Channels,* 9 (3): 3-25.

Boyd, Eric D. and Robert Spekman (2004), "Internet Usage within B2B Relationships and Its Impact on Value Creation: A Conceptual Model and Research Propositions," *Journal of Business-to-Business Marketing,* 11-1/2, 9-32.

Bush, Alan J. Victoria D. Bush, Linda M. Orr, and Richard A. Rocco (2007), "Sales technology: Help or hindrance to ethical behaviors and productivity?" *Journal of Business Research,* 60, 1198-1205.

Cannon P. Joseph, and William D. Perreault Jr. (1999), "Buyer-Seller Relationships in Business Markets," *Journal of Marketing Research,* 36 (November), 439-460.

Churchill, Gilbert A., Jr. (1979), "A Paradigm for Developing Better Measures of Marketing Constructs," *Journal of Marketing Research,* 16, 64-73.

Dwyer, F. Robert, Paul H. Schurr, and Sejo Oh (1987), "Developing Buyer-Seller Relationships," *Journal of Marketing*, 51 (April), 11-27.

Engle, Robert L., and Michael L. Barnes (2000), "Sales force automation usage, effectiveness, and cost-benefit in Germany, England and the United States," *Journal of Business & Industrial Marketing,* 15-4, 216-242.

Frohlich, Markham T. and Roy Westbrook (2002), "Demand chain management in manufacturing and services: web-based integration, drivers and performance," *Journal of Operations Management,* 20, 729-45.

Gilliland, David I. (1997), "Manufacturers' Commitment to Industrial Distributors: Governance Implications and Performance Consequences," Doctoral Dissertation, Georgia State University.

Hair, Joseph F. Jr., Williams C. Black, Barry J. Babin, Rolph E. Anderson, and Ronald L. Tatham (2006), *Multivariate Data Analysis,* 6th Edition, Prentice-Hall: Upper Saddle River, NJ.

Heide, Jan B. (1994), "Interorganizational Governance in Marketing Channels," *Journal of Marketing*, 58 (1), 71-85.

_____, ___ _., and George John (1992), "Do Norms Matter in Marketing Relationships?" *Journal of Marketing,* 56 (2), 32-45.

Hekkila, Jussi (2002), "From supply to demand chain management: efficiency and customer satisfaction," *Journal of Operations Management,* 20, 747-67.

Hill, Ned C. and Michael J. Swenson (1994), "The Impact of Electronic Data Interchange on the Sales Function," *Journal of Personal Selling and Sales Management*, 24 (Summer), 79-87.

Honeycutt, Earl D. Jr (2005) "Technology improves sales performance –doesn't it? An introduction to the special issue on selling and sales technology" *Industrial Marketing Management,* 34, 301-304.

Jap, Sandy D. and Ernan Haruvy (2008) "Interorganizational Relationships and Bidding Behavior in Industrial Online Reverse Auctions," *Journal of Marketing Research,* 45 (5), 550-561.

Johnson, Devon S. and Sundar Bharadwaj (2005), "Digitization of Selling Activity and Sales Force Performance: An Empirical Investigation," *Journal of the Academy of Marketing Science*, 33 (1), 3-18.

Joreskog, Karl G., and Dag Sorbom (1996), *LISREL 8: User's Reference Guide,* Chicago: Scientific Software International.

Karahanna, Elena and Detmar W. Straub (1999), "The psychological origins of perceived usefulness and ease-of-use," *Information & Management*, 35, 237-250.

Lee, Hae Young, Yong-Ki Lee and Dowan Kwon (2005) "The intention to use computerized reservation systems: the moderating effects of organizational support and supplier incentive," *Journal of Business Research,* 58, 1552-1561.

Mayer Roger C. Davis James H. The Effect of the Performance Appraisal System on Trust for Management : A Field Quasi-Experiment. Journal of Applied Psychology 1999; 84 (1): 123-136.

Mirani, Robert, Deanne Moore and John A. Weber (2001), "Emerging Technologies for Enhancing Supplier-Reseller Partnerships," *Industrial Marketing Management,* 30, 101-14.

O'Callaghan, Ramon, Patrick J. Kaufmann and Benn R. Konsynksi (1992) "Adoption Correlates and Share Effects of Electronic Data Interchange Systems in Marketing Channels," *Journal of Marketing*, 56 (2), p. 45-56.

Oracle (2006), "Enabling Partner Value Networks Through Partner Relationship Management," White Paper, August (updated), accessed on www.oracle.com on March 11, 2007.

Podsakoff, Philip M., Scott B. MacKenzie, Nathan P. Podsakoff and Jeong-Yeon Lee (2003), "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology*, 88(5), 879-903.

Rogers, Everett (1995), *Diffusion of Innovations*, New York: Free Press.

Sapienza Harry J. Korsgaard Audrey M. Procedural Justice in Entrepreneur-Investor Relations. Academy of Management Journal 1996; 39 (3): 544-574.

Soliman, Khalid S. and Brian D. Janz (2004), "An exploratory study to identify the critical factors affecting the decision to establish Internet-based interorganizational information systems," *Information & Management*, 41, 697-706.

Srinivasan, Raji, Gary L. Lilien, and Arvind Rangaswamy (2002), "Technological Opportunism and Radical Technology Adoption: An Application to E-Business," *Journal of Marketing,* 66 (July), 47-66.

Speier, Cheri and Viswanath Venkatesh (2002), "The Hidden Minefields in the Adoption of Sales Force Automation Technologies," *Journal of Marketing*, 66 (July), 98-111.

Venkatesh, Viswanath, Michael G. Morris, Gordon B. Davis, Fred D. Davis (2003), "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly*, 27-3, 425-478.

Wu, Fang, Vijay Mahajan and Sridhar Balasubramanian (2002), "An Analysis of E-Business Adoption and Its Impact on Business Performance," *Journal of the Academy of Marketing Science,* 31 (4), 425-47.