SME's Perceptions of IOR Impact on Customer Loyalty in B2B E-Commerce: An Empirical Analysis

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ABSTRACT

This study is an empirical examination of the impact of the Internet's web tools on the inter-organizational relationships (IOR) between SMEs and their loyal customers. Data collected from 386 SMEs in North America (United States and Canada) and processed with Partial Least Square (PLS) show that the use of web tools (which include the level of web content and the level of security on the Internet) has a positive impact on the relation between cooperation and interdependence, and customer loyalty. However, the impact of the Internet's web tools on the relation between trust and customer loyalty is different, because the use of non-secure web tools reduces the impact of trust on customer loyalty, and surprisingly, the use of secure web tools doesn't increase or decrease the impact of trust on customer loyalty. The implications of the results for the study are discussed.

INTRODUCTION

Small and medium-sized enterprises (SMEs) are the fastest growing segment of most economies and are perceived to be more flexible and adaptable in terms of structure and speed of response than larger organizations (Caldeira and Ward, 2002). Large companies already exploiting electronic commerce applications offer multiple new services and receive significant benefit from them (Tagliavini et al., 2001). This success is not limited to large corporations because the lower-cost Internet technologies have diminished the advantages previously held by large multinational corporations (Lituchy and Rail, 2000). SMEs are also set to benefit from electronic commerce on the Internet (Poon, 2000).

The information systems (IS) community has given significant attention to inter-organizational relationships (IOR) supported by the Internet's web tools (the level of web content and the level of security on the Internet) (Cavusoglu et al., 2002). Several authors have argued that these concepts can provide a strategic advantage via customer loyalty to SMEs (Porter, 2001; Gefen, 2002; Lam et al., 2004). Another determinant of customer loyalty is the degree of trust that customers have in the vendor (Chow and Holden, 1997; Reichheld and Schefter, 2000). The use of the Internet's web tools may have an effect on the relation between trust and customer loyalty because trust is a precursor to customer loyalty.

This article focuses on B2B electronic commerce because according to a recent report, the value of goods and services sold via B2B electronic markets will reach $2.7 trillion by the year 2004, representing some 27% of the overall B2B market and almost 3% of global sales transactions (Gartner Group, 2000). While these figures give the impression that B2B electronic commerce is expanding fast, the fact remains that many SMEs are still sitting on the sidelines (Teo et al., 2003). Many SMEs that maintain IOR with their customers have difficulties achieving the benefits as suggested by media and early research (Poon, 2000). In addition, there is little existing research that has empirically tested the impact of the Internet's web tools on IOR which lead to customer loyalty.

The primary objective of this study is to examine the effects of the Internet's web tools on the IOR between SMEs and their loyal customers.

THEORETICAL RESEARCH MODEL & HYPOTHESES

The use of Internet technology to link SMEs to their customers can be demonstrated to have an effect on their loyal customer base. The Internet's web tools, such as the level of web content and the level of security on the internet, can support the formation and maintenance of IOR because they facilitate the way organizations cooperate with, depend upon, and trust each other. The quality of a web site can directly influence the type of relationships developed between SMEs and their loyal customers.

The key constructs of the research model, identified through the objective of this paper, are as follows: the dependent variable will be drawn from customer loyalty construct, the independent variables will be drawn from the IOR construct and the moderating variables will be drawn from the Internet's web tools construct.

Customer Loyalty

In this paper, loyalty is defined as building and sustaining a trusted relationship with customers that leads to the customers' repeated purchases of products or services over a given period of time (Gefen, 2002; Lam et al., 2004).

Customer loyalty, in general, increases profit and growth in many ways to the extent that increasing the percentage of loyal customers by as little as 5% can increase profitability by as much as 30% to 85%, depending upon the industry involved (Gefen, 2002).

IOR from SMEs Perspectives

In this study, an IOR is defined as the process whereby an SME builds long-term relationships with current customers so that both seller and buyer work toward a common set of specified goals (Evans and Laskin, 1994). The primary goal of an IOR is to achieve a competitive advantage via mutual loyalty in relation to companies outside their network. Therefore an IOR is heavily dependent upon relationships based on cooperation, interdependence and trust. Each of them is discussed.

Cooperation

It is defined in this study as coordinated actions taken by parties to achieve mutual outcomes (Lewin and Johnson, 1997). Cooperation

promotes effective relationship success. Cooperation is proactive because it suggests actively agreeing to advertise a partner's products.

Interdependence

Parties involved in an IOR become interdependent when there are significant switching costs associated with replacing the incumbent suppliers (Lewin and Johnston, 1997). Interdependence is an important relationship variable (Reichheld and Schefter, 2000). A loyal customer will remain with a vendor because the cost of switching to another vendor is too high (Reichheld and Schefter, 2000).

Trust

Trust is a willingness to rely on an exchange partner in whom one has confidence (Berry, 1995). Becoming a trusted partner of a customer is a key to maintaining IOR. Trust can be achieved by providing the customer with valuable information using a high quality web site.

Internet's Web Tools

The Internet's web tools range from simple associatively linked collections of static hypertext documents to interactive, integrated, customizable solutions and agent-based negotiation support (Gefen, 2002). There are essentially two variables that encompass the construct of the Internet's web tools: the level of web content and the level of security on the Internet.

The Level of Web Content

The level of web content is defined as the new Internet-based channels through which SMEs can display information about themselves and the products and services they offer or, better yet, as a dynamic interactive portal (Joseph et al., 2001).

The Level of Security on the Internet

The level of security on the web is defined as the risks associated with web technology assets such as loss, disruption, and unauthorized access of information, data, and Internet resources (Cavusoglu et al., 2002). One of the greatest concerns about doing business on the Internet is the level of security in transactions (Cavusoglu et al., 2002). The perception of unsatisfactory security on the Internet is one of the primary hindrances of IOR. Despite advances and endeavors in Internet security mechanisms, companies are still concerned about using an impersonal transaction medium like the Internet for secure transactions (Cavusoglu et al., 2002). Although organizational acceptance of the risk of conducting transactions over the Internet is growing, it is still wavering.

Figure 1. Theoretical Research Model

The Research Model

This research model enables us to test the following hypotheses.

H1: Cooperation will have a positive effect on customer loyalty.
H2: Interdependence will have a positive effect on customer loyalty.
H3: Trust will have a positive effect on customer loyalty
H4: The level of web content will have a positive effect on the relation between IOR and customer loyalty.
- **H4a:** The level of web content will have a positive effect on the relation between cooperation and customer loyalty.
- **H4b:** The level of web content will have a positive effect on the relation between interdependence and customer loyalty.
- **H4c:** The level of web content will have a positive effect on the relation between trust and customer loyalty.

H5: The level of security on the Internet will have a positive effect on the relation between IOR and customer loyalty.
- **H5a:** The level of security on the Internet will have a positive effect on the relation between cooperation and customer loyalty.
- **H5b:** The level of security on the Internet will have a positive effect on the relation between interdependence and customer loyalty.
- **H5c:** The level of security on the Internet will have a positive effect on the relation between trust and customer loyalty.

METHODOLOGY

Study Sample

The sample consists of 1700 SMEs in the USA and Canada, each having a website and an e-mail address. Company size is measured by number of employees (Chow and Holden, 1997). In this study, an SME is one with less than 500 employees. The senior sales representative, company executive, or president of each of the above companies was sent a cover letter through the Internet (by e-mail) along with the URL of the web site containing the research instrument (questionnaire). As an incentive, respondents were told that a summary of the results would be sent at their request. A total of 386 SMEs responded, producing a 22.7% response rate. The response rate achieved is acceptable, given the length of the research instrument, the technical and confidential nature of the information requested and the nature of the respondents.

Measures

All of the measures were selected from the survey instrument used by Lawson-Body (2003) in his study. After slight modification, the questions measuring all of the variables, except loyalty, used a scale of 1 (never) to 5 (always). The questions measuring Interdependence used a scale of 1 (disagree very strongly) to 6 (agree very strongly). The scale used to measure Loyalty was 1 (decreasing sharply) to 5 (Increasing sharply). Since the instruments have been slightly revised from the original ones, reliability coefficients have been obtained.

Table 1 presents the reliability coefficients Rho. Its first column presents the independent and dependent variables of the research model. The second column of table 1 presents the indicator of the reliability of a measure which is the Rho coefficient. Aubert et al., (1994) report that the guidelines established by Nunnally (1978) for the interpretation of Cronbach's alpha also apply to the Rho coefficient. These guidelines estimate that acceptable reliability coefficients must be higher than 0.6. It can be seen that all Rho coefficients are ranged between 0.735 and 0.869. This is considered very satisfactory.

To measure the Internet web tools variables, the evaluation grid, mounted according to the guidelines offered by Kassarjian (1977) and found in the study of Lawson-Body (2003) was used. Internet's web tools such as the level of web content and the level of security on the Internet were evaluated by two judges: the researcher and a graduate student. The inter-judges reliability coefficient is 81%. Berelson (1952; cited in Kassarjian, 1977) claimed a range located between 66% and 95% for acceptable inter-judges reliability coefficients. The ratio of 81% appeared to be satisfactory.
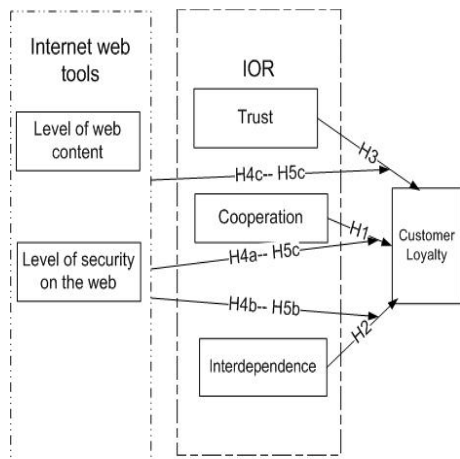
Table 1. Reliability Coefficient Rho

Variables	Coefficients Rho
Interdependence	0.869
Cooperation	0.754
Trust	0.726
Loyalty	0.735

Table 2. Path Coefficient and Student's T (T values)

	Loyalty (R² = .78)	
	Path coefficient	T-Statistic
Interdependence	0.3458	2.2856*
Cooperation	0.2273	2.0041*
Trust	0.193	1.7780*

*T-Student significant at 1.64 (P<= 0.05)

Table 3. Coefficients of T-Statistic, Weights and Loadings

Items and variables	Weight	Loading	T-Statistic
Loyalty			
LOYA VE[1]	0.1888	0.3712	1.7615*
LOYREGS	0.4517	0.5702	2.2299*
LOYPERP	0.7817	0.5455	2.3671*
LOYPERT	-0.0041	0.4002	1.5039
LOYPERF	0.3652	0.5189	2.8707*
LOYPERH	0.5170	0.4520	1.8856*
LOYEXP	0.0014	0.1737	1.2700
LOYNBF	0.0147	0.2415	1.5203
LOYGEN	0.3280	0.5521	2.5801*
Interdependence			
INDCOST	0.6698	0.2244	2.4208*
INDTERM	0.3585	0.5718	1.7997*
INDDIFF	-0.4661	0.1251	0.4473
INDBENEF	1.2068	0.4113	2.8384*
Cooperation			
COOPHELP	0.2262	0.4271	2.4766*
COOPDECI	0.5961	0.8303	1.8230*
COOPOLIC	-0.2407	0.0030	0.6745
COOPRECO	0.5889	0.5543	2.0624*
Trust			
TRUSTPRO	0.0968	0.2306	1.0420
TRUSTHON	0.8102	0.6166	1.9185*
TRUSTIME	0.7682	0.6064	2.4812*
TRUSTCOU	0.7490	0.5259	1.9207*
TRUSTINT	0.3333	0.1423	1.7671*
TRUSTEXP	0.4895	0.3952	2.3651*

*T-Student significant at 1.64 (P<= 0.05)

ANALYSIS AND RESULTS

Procedures for Testing the Hypothesis
In this research, Partial Least Squares (PLS), a second generation multivariate method was used to process and analyze the data. The PLS method simultaneously evaluates both the measurement model and the theoretical model. It adjusts the relationships among the variables accordingly (Aubert et al., 1994). PLS was selected in this research because it presupposes no distributional form on the data.

Hypothesis Testing (H1, H2 and H3)
The test of Hypothesis H1, H2 and H3 on the sample of the 386 respondents was carried out with a statistical tool named PLS-GRAPH. Table 2 shows that Student's T (t value) of impacts of interdependence (2.2856), cooperation (2.0041), and trust (1.7780) on customer loyalty are higher than 1.65 (P<=0.05). This first hypothesis test shows that these three variables of the IOR have a positive and direct impact on customer loyalty. In other words, customer loyalty is increased (R² = .78) by interdependence, by cooperation, and by trust, supporting H1, H2, and H3 respectively.

Table 4. Path Coefficient and Student's T (T values) for the Interaction Effect

	Loyalty	
	Path coefficient (Beta standardized)	T-Statistic
Interdependence	0.2364	2.7410*
Cooperation	0.3331	2.7010*
Trust	0.3104	3.1170*
Level of security on the Internet X Interdependence	0.2895	1.8902*
Level of web content X Interdependence	0.2960	1.7523*
Level of security on the Internet X Cooperation	0.3419	2.4560*
Level of web content X Cooperation	0.3459	3.1107*
Level of security on the Internet X Trust	0.3108	3.1114*
Level of web content X Trust	0.2419	1.5641

*T-Student significant at 1.64 (P<= 0.05)

The coefficient of T-statistic and the weights presented in table 3 show that only some indicators (items) contribute to the formation or creation of the variable customer loyalty and the three variables (interdependence, cooperation and trust) which have impact on customer loyalty. The indicators with (*) asterisks in table 3 bring their contribution to the creation of the variable they are connected to. According to the values of their T-statistics, some indicators contribute more than others to the formation of their variables. The indicators presented in table 3 which do not have (*) asterisks do not play enough role in the formation of their corresponding variables.
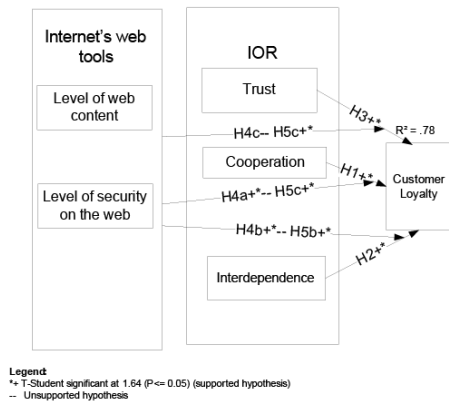
The results from the survey of 386 SMEs in North America concur: because of the significant value of T-statistics in the last column of table 4, the Internet's web tools (which include the level of web content and the level of security on the Internet) have a positive impact on the relation between cooperation and interdependence, and customer loyalty. However, that impact is debatable for trust. The path coefficient with interaction is lower for the impact of the level of web content on the relation between trust and customer loyalty; this indicates a lower size of the interaction effect. That impact differs from the impact of the level of security on the Internet on the relation between trust and customer loyalty. For example, the beta for the impact of trust on customer loyalty is 0.3104. The interaction betas for the impact of the Internet's web tools on the relation between trust and customer loyalty are 0.3108 and 0.2419 respectively. In consequence, the use of non-secure web tools reduces the impact of trust on customer loyalty and the use of secure web tools doesn't increase or decrease the impact of trust on customer loyalty. There are improvements with the interactions between the use of web tools and interdependence, and the use of web tools and cooperation on loyalty. The betas for the impact of interdependence on loyalty and for the impact of cooperation on loyalty are 0.2364 and 0.3331. The interaction betas for the impact of the Internet's web tools on the relation between interdependence and loyalty are 0.2895 and 0.2960. The interaction betas for the impact of the Internet's web tools on the relation between cooperation and loyalty are 0.3419 and 0.3459.

DISCUSSION AND CONCLUSION
We found support for eight of our nine hypotheses. More importantly, we found that the use of web sites increases cooperation and interdependence between SMEs and their loyal customers. We also found that the impact of the use of secure web sites on the relation between trust and customer loyalty is neutral. However, we failed to find support for the impact of the use of non-secure web sites on the relation between trust and customer loyalty. That means, if SMEs use non secure web sites to maintain a relationship with their customers, trust in SMEs will decrease, therefore customers will be less loyal to SMEs.

The main contribution of this study has been to provide empirical evidence on the impact of the Internet's web tools on the relation

Figure 2. Results of PLS Analysis

Legend:
*+ T-Student significant at 1.64 (P<= 0.05) (supported hypothesis)
-- Unsupported hypothesis

between cooperation, interdependence, and trust and customer loyalty. In fact, business is based on trust between two parties, whether the business is conducted in person, by phone, or over a web site. The customer can get a sense of the company and the person from face-to-face discussions or from the appearance and location of the office; but this element of trust is difficult to reconstruct in electronic transactions because all the customer knows about the supplier is what can be seen on the web site. Therefore, creating trust via the web depends on fostering IOR through electronic means of well-established web tools. When SMEs treat the web as more than just a communication tool, the trust between companies will grow, an IOR will be developed and maintained, and customer loyalty will develop.

The findings of this research will help SMEs identify the IOR factors which they should emphasize when the Internet's web tools are used to augment customer loyalty:

Future research is necessary because Internet technology evolves so rapidly and its evolution may likely affect in different ways the relationship between trust and customer loyalty. Additional research should also expand the range of the Internet's web tools variables and examine their effects on the link between IOR and customer loyalty.

REFERENCES

Aubert, B., S. Rivard and M. Patry (1994). "Development of Measures to Assess Dimensions of IS Operation Transactions," *ICIS*, Vancouver, December 14-17, pp.13-26.

Berry, L. L. (1995). "Relationships Marketing of Services- Growing Interest, Emerging Perspectives," *Journal of Academy of Marketing Science* 23, 236-245.

Caldeira, M. M. and M. J. Ward (2002). "Understanding the successful adoption and use of IS/IT in SMEs: an explanation from Portuguese manufacturing industries," *Information Systems Journal* 12, 121-125.

Cavusoglu, H., S. Raghunathan and B. Mishra (2002). "Optimal design of information technology security architecture," *Twenty-Third ICIS*, 749-756.

Chow, S. and R. Holden (1997). "Toward An Understanding Of Loyalty: The Moderating Role Of Trust," *Journal Of Managerial Issues* 9, 275-298.

Evans, J. R. and R. L. Laskin (1994). "The Relationship Marketing Process : A Conceptualization and Application," *Industrial Marketing Management*, 23, 439-452.

Gartner Group. "GartnerGroup Forecasts Worldwide Business-to-Business E-Commerce to Reach $7.29 Trillion in 2004, "press release, February 17, 2000 (available at http://gartner11.gartnerweb.com/public /static/aboutgg/pressrel/pr012600c.html

Gefen, D. (2002). "Customer Loyalty in E-Commerce," *Journal of the Association for Information Systems*, 3, 27-51.

Joseph V. B., R. W. Cook., and R. G. Javalgi (2001). "Marketing on the Web: How Executives Feel, What Businesses Do," *Business Horizons*, 44, 32- 40.

Kassarjian, H. H. (1977) "Content Analysis in Consumer Research", *Journal of Consumer Research,* 4, 8-18.

Lam, S., V. Shankar, K. Erramilli, and B. Murthy, (2004). "Customer Value, Satisfaction, Loyalty, and Switching Costs: An Illustration From a Business-to-Business Service Context," *Journal of the Academy of Marketing Science*, 32, 3, 293-311.

Lawson-Body A., (2003). "An Instrument for Measuring the Effect of Trusted Electronic Inter-organizational Relationships on Customer Loyalty", *Proceedings of the 2003 Americas conference on Information Systems (AMCIS 2003),* Tampa, Florida, USA, August 4-6, 2003.

Lewin, J. E. and W. J. Johnston (1997). "Relationship Marketing Theory in Practice: A Case Study," *Journal of Business Research*, 39, 23-31.

Lituchy, T., R. and A. Rail (2000). "Bed and Breakfasts, Small Inns, and the Internet: The Impact of Technology on the Globalization of Small Businesses," *Journal of International Marketing*, 8, 86-97.

Poon, S. (2000). "Business environment and internet commerce benefit—a small business perspective", *European Journal of Information Systems*, 9, 72-81.

Porter, M. E. (2001). "Strategy and the Internet," *Harvard Business Review*, 79, 63-78.

Reichheld, F. F. and P. Schefter (2000). "Your Secret Weapon on the Web," Havard Business Review, 78, 105-113.

Tagliavini, M., A, Ravarini and A. Antonelli (2001). "An evaluation model for electronic commerce activities within SMEs," *Information Technology and Management,* 2, 211-230.

Teo, H. H., K. K. Wei and I. Benbasat (2003). "Predicting Intention to Adopt Interorganizational Linkages: An Institutional Perspective", *MIS Quarterly*, 27. 19-49.

APPENDIX A: FULL DEFINITION OF ITEMS

	Loyalty
Items	Questions
LOYA VE	The average number of years during which your firm maintains business relationships with its customers
LOYREGS	Your firm maintains business relationships with its customers
LOYPERP	The percentage of sales to regular customers (customers with whom your firm maintains business relationships) out of your firm's total sales
LOYPERT	The percentage of sales from regular customers instead of one time sales
LOYPERF	The frequency of sales from your firm's regular customer
LOYPERH	The total dollar value sales from your firm's regular customer
LOYEXP	The average yearly revenue per regular customer
LOYNBF	The number of your firm's regular customers
LOYGEN	In general, your firm's customers repeat purchases of products and/or services.
	Interdependence
Items	Questions
INDCOST	In your judgment, the total costs to your firm in switching to a competitor's product line would be
INDTERM	The average length of time your firm relationship lasts with your customers
INDDIFF	Differences of opinion between your firm and its customers will probably be viewed as just a part of doing business
INDBENEF	Differences of opinion between your firm and its customers will likely results in benefits to both of them
	Cooperation
Items	Questions
COOPHELP	Your firm helps out its customers in whatever ways they ask
COOPDECI	Customers have considerable latitude in deciding how much technical support they get from your firm for their products
COOPOLIC	Your firm complies with the policies that customers establish for the marketing of their products
COOPRECO	Customers follow whatever recommendations your firm makes regarding the marketing and selling of its product line
	Trust
Items	Questions
TRUSTPRO	I have found that my firm's customers can rely on it to keep the promises that it makes
TRUSTHON	My firm is basically honest toward its customers
TRUSTIME	In my firm's relationship with its customers, it cannot be trusted at times
TRUSTCOU	In my firm's relationship with its customers, it can be counted on to do what is right
TRUSTINT	In my firm's relationship with its customers, it has high integrity
TRUSTEXP	My firm enjoys a high level of trust with its customers

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