

**e-TRUST: EMPIRICAL INSIGHTS
INTO INFLUENTIAL ANTECEDENTS**
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The purpose of this study was to examine determinants of e-Trust based on theories drawn from marketing, management, information systems, and e-Commerce literature. Regression analysis was used to test the proposed model. The results indicated that while constructs for web site information and web site experience were predictors of e-Trust, the construct for security and privacy of information was not. Web site information was the strongest predictor of e-Trust. This is the first such study to incorporate all of these predictors into a single model. This knowledge can provide the firm with ways to increase electronic trust and subsequent increased profit levels.

INTRODUCTION

According to eMarketer Report, a private sector consulting firm, electronic commerce is expected to increase dramatically. The business-to-consumer (B2C) market alone was forecasted by the Gartner Group to grow from \$49 billion in 2001 to \$ 329 billion in 2010 (corporate.exalead.com). A recent study by Lin et al. (2006) indicated that "online retail sales in the US will reach nearly \$230 billion by 2008" (p. 435). However, a study by JupiterResearch has indicated that 71 percent of the Internet users will use the Internet to shop by 2010 (sda-asia.com). These elements reflect the expanding importance of e-commerce.

e-Commerce is predicated on trust (Pavlou, Liang and Xue 2007; Hwang and Kim 2007; Chen and Barnes 2007). The establishment of trust in customers' minds is an important step in the process of creating sound business relationships with them. Failure of a company to deliver satisfactory products or services, for example, results in an overall distrust of the company itself with a loss of trust in a company (Gamma 2003). Internet-based commerce adds other dimensions to the bases for trust such as the security of customer's PCs and personal and financial information.

In order to participate in the unprecedented growth opportunity that the e-Business economy offers, organizations must have the key foundations of trust clearly in place. With the Internet, those bases start with sound security procedures and supporting technologies so that customers are confident they can trust that their personal information, such as credit card numbers, financial data or medical information, remains secure. In short, security fosters e-Business activity by establishing one of the foundations of trust.

Recent market surveys and research reports have shown that trust and security are still considered to be the main barriers for acceptance of e-Business (Van Slykes et al. 2007; Ratnasingam, Gefen and Pavlou 2005; Warrington, Abgrab and Caldwell 2000; Hoffman, Novak and Peralta 1999). When trust is well established, customers are more likely to share personal information. Thanks to trust and subsequent information sharing, companies like Amazon.com can successfully implement features like one-click shopping and thus enhance customers' online shopping experience (Morgan 2000).

Morgan (2000) defined E-trust as a qualified reliance on the information that customers get from the web site, so that they feel confident in doing business online. It results from the firm belief that a trustworthy company is one that is reliable, has high integrity, and that is associated with such qualities as consistency,

competency, honesty, fairness, responsibility, helpfulness, and benevolence (Altman and Taylor 1973; Dwyer and LaGace 1986; Rotter 1971).

Ngai and Wat (2002) reviewed the literature on e-Commerce and suggested that regardless of the product or service, a company can begin the process of building e-Trust with their web site viewers and potential customers by: (1) giving accurate and complete information on their web site to demonstrate to customers that the site is genuine, and (2) giving customers a positive experience.

A recent investigation revealed that of 275 published articles on electronic commerce only three were related to the topic of e-Trust (Thakur and Summey 2005; Ngai and Wat 2002). Even though an understanding of e-Trust is important for the success of e-Commerce, there have been only a few scholarly studies done on the subject and none of the studies have examined how site information, data security, and web site experience might lead to e-Trust. Most researchers in marketing, management, information systems, and e-Commerce would not agree that these three constructs are related to e-Trust and, none have incorporated all three predictors into a single model. The objective of this study is to find out how these factors are associated with e-Trust.

To fulfill that objective, the study is structured as follows. First, it briefly reviews existing literature on e-Trust and the theories behind e-Trust. The conceptual model developed for this study was derived from those theories. The presentation of the model is followed by research hypotheses, methodology, result and analyses, and discussion. The study concludes with some suggestions for future research.

LITERATURE REVIEW

Trust is a subjective matter, so it may differ from customer to customer. What some trust, others fear. Trust, when related to business, is built on the different aspects of how the firm

presents itself, how it manages its brand image, and its behavior in its relationships with its customers, for example with regard to privacy. Trust builds confidence in customers' minds hence they are more willing to engage in a purchase relationship with an organization they trust (Keen 2000). Research has shown that in e-Business, it is very difficult to trust one's partner because of the inability of partners to know each other on a personal basis (Morgan and Hunt 1994). This study proposes a model that explains important factors which contribute to e-Trust.

The conceptual model used in this study evolved from theories taken from multi-disciplinary literature including marketing, management, information systems, and e-Commerce. The following four theoretical perspectives were found to be relevant: trust in business relationships, trust and security based mechanisms in e-Commerce, expectation-confirmation theory, and social exchange theory.

These theoretical perspectives contributed to an understanding of the potential strengths and weaknesses of the relationships inherent in e-Commerce interactions. The following section discusses how these theories lead to the conceptual model.

Theories of Trust

Previous scholars who examined trust in business relationships identified trust to be a key factor in building long term relationships with customers and business partners (Brown and Pritchard 2006; Renner and Tyran 2004; Bordonaba-Juste and Polo-Redondo 2004). For example, trust has been found to increase cooperation, thus leading to communication openness and information sharing (Cummings and Bromiley 1996; Doney and Cannon 1997; Morgan and Hunt 1994; Ring and Van de Ven 1994; Smith and Barclay 1997). Other studies have shown that web sites which can provide high quality services, such as timely delivery of accurate information to their customers, achieve a high level of trust. McAllister (1995)

suggested that the customer's decision of which web site to patronize and under what conditions depended on the confidence that web site was able to create in the customer's mind.

The choice of a web site for engagement is cognitive based. It is predicated on the experience customers have had with that site. A positive experience contributes to a feeling of trust and hence to the perception that the site is reliable and dependable. When reliability and dependability expectations are met, trust moves to an affective foundation that includes emotional bonds such as care and concern. As a web site generates trust by meeting the expectations of customers and by giving them a positive experience, it builds a base of customer loyalty. A consistent, positive experience with a site fosters a foundation of familiarity and confidence, conditions that move customers to perceive the site to be more reliable, predictable, and, therefore, trustworthy.

Trust and Security Based Mechanisms

Trust is enhanced by security based mechanisms that provide protective measures for safeguarding individual information (Jamieson 1999). Customers will be more likely to trust e-Commerce and to be more willing to go forward with web transactions if the site provides them with high-quality information, in an efficient manner, and in a secure environment. These elements will contribute to a trustworthy image of the web site. When a firm fails to provide those minimal levels of service and security, perceived risks might escalate, eroding e-Trust in customers' minds.

Expectation-Confirmation Theory

"Expectation-confirmation theory is adopted from the consumer behavior literature" (Bhattacharjee 2001, p. 351). This theory states that a customers' satisfaction depends on their comparison of post-purchase evaluation of a product or a service with pre-purchase expectations (Kim, Ferrin and Rao 2003). In a similar way, one might say that when customers' positive expectations of a web site

match their actual experience in using that site, the result will be customer satisfaction and subsequent development of e-Trust. Expectation confirmation theory is widely used in marketing literature to study customer satisfaction (Bhattacharjee 2001; Dabholkar, Shepard and Thorpe 2000).

Social Exchange Theory

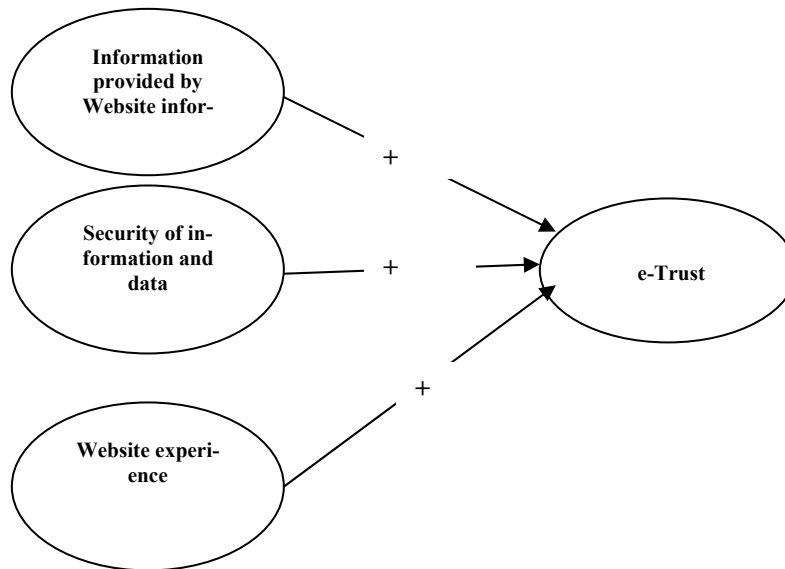
Social exchange theory (Blau 1964) suggests that consumer-supplier (client-vendor) relationships will continue or terminate depending on the positive or negative experiences in those relationships. A business' reputation may moderate negative experiences to some extent, but relationships are nevertheless damaged when they occur (Van de Ven 1976). Levinthal and Fichman (1988) studied the determinants of persistence in relationships basing their research on past exchanges that resulted in an increased likelihood of future exchanges. According to that study, the two important factors that would increase the likelihood of future exchanges were reputation of the business, which builds trust in the customers' minds, and experiences that customers had during their exchanges.

Thus, from the above it can be said that social exchange theory is a relationship maintenance theory based on both the past experience of the customer with transactions, and the viability and reputation of the business with which the customer made the exchange (Van de Ven 1976). This theory also looks at how people arrive at their decisions in such relationships. It posits a matrix system of measuring outcomes, taking into account the actions of others.

AN INTEGRATED FRAMEWORK OF DETERMINANTS OF e-TRUST

Based on the four theories presented above, a research model is presented in Figure 1 that proposes an integrated framework of determinants of e-Trust. The flow in that model suggests that the four theoretical frameworks have a positive impact on the development of trust. Using that theoretical

FIGURE 1
An Integrated Framework of the Determinants of e-Trust



foundation, a series of research hypotheses are presented which provide a basis for gaining insights into the conditions firms should expect when engaging in e-Commerce based relationships with their customers.

RESEARCH HYPOTHESES

In previous work on e-Trust, Hoffman et al. (1999) and Ratnasingam (1998) proposed that besides technical security infrastructure, other factors were strong indicators of consumers’ trust of a web site. They identified two variables that influenced consumers’ e-Trust. Those variables were: (1) information provided by the web site and (2) security of information and data provided by customers to the web site. In congruence with evolving technologies, other variables may also be seen as important determinants of e-Trust. In addition to information and security of data, variables such as customers’ past experiences with a web site should also be considered important in establishing e-Trust.

e-Trust

Trust pervades most personal and business activity. A clear and concise definition of trust

has been elusive. It is quite difficult to find a definition of “trust” that fits every case (McKnight and Chervany 2001). In the case of e-Business, trust has been defined as “the willingness of a party to be vulnerable to the actions of another party based on expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor and control the other party” (Mayer, Davis and Schoorman 1995, p. 712). e-Trust has also be defined as: “willingness to rely on an exchange partner in whom one has confidence,” (Moorman, Deshpande and Zaltman 1993, p. 82; Moorman, Zaltman and Deshpande 1992) and additionally that the other party is reliable, honest, consistent, and fair (Morgan and Hunt 1994). Recent studies have indicated that e-Trust is a matter of perception and is built around key important components such as security, company policies, and company publicity of those privacy policies that help them to safeguard customers’ confidential information (Van Dyke, Midha and Nemati 2007; Pan and Zinkhan 2006; Metzger 2006; Faja and Trimi 2006; Meinert et al. 2006; Pollach 2006; Pollach 2005; Ashrafi and Kuiboer 2005; Moores 2005; Hong-Youl 2004). Customers would probably be more willing to provide personal data online if their level of

trust justified their disclosing that data. To enable that outcome, Lotto (2001) suggested that enterprises should take five steps that can help to reduce customer concerns about privacy and thus build e-Trust. Those steps include:

- Providing clear and conspicuous notice concerning what sort of information is being collected, how it will be used, and whether it will be disclosed to other parties.
- Letting consumers choose whether, and by whom, their information can be reused.
- Encouraging consumers to review and amend their personal information files.
- Controlling, monitoring, and restricting access to consumers' personal information.
- Letting consumers know about the decisions being made about them, the information on which those decisions were based, and the implications of those decisions.

Information provided by the Web site

According to information processing theory, the most important determinant of e-Trust is how the information is presented on the web site is. Several studies have indeed shown that the mode of information presentation affects e-Trust and on-line shopping behavior (Chau, Au and Tam 2000; Hoffman, Novak and Chatterjee 1995; Palmer and Griffith 1998). A good user interface with an appropriate mode of information presentation is the key to acceptance and usage of a web site (Chau et al. 2000).

A study done by Hoffman et al. (1999) revealed that the primary barriers to customers providing demographic data to web sites were related to trust and the nature of the exchange relationship. That study found that nearly 63 percent of customers who declined to provide personal information reported that they did not trust the entity collecting the data. Customers simply may not trust most web providers enough to engage in a relationship with them.

Cheskin's (2000) study showed that e-Trust was a two-step process: (1) being 100 percent perfect in the attributes customers give more

importance to, and (2) showing that you are working to add something special to your offering. Trust is about more than just creating a secure place to make credit card orders. Shoppers give their trust to sites that are consistent from the start. Thus, we hypothesize:

H_{1a}: The more consistent the information the web site provides to their customers, the higher the e-Trust customers would have for that site.

H_{1b}: The more accurate the information the web site provides to their customers, the higher the e-Trust customers would have for that site.

Security of Data

Security of data means that no one other than the individual customer and the web site owner has access to the customer's personal information. A study done by Hoffman et al. (1999) found that 69 percent of web users did not provide data to web sites because the sites provided no information about how their data would be used. One study found that 86 percent of commercial web sites provided no information of any kind regarding how the demographic data they had collected would be used (Landesberg, Toby, Caroline and Lev 1998). Consumers respond accordingly, either by withholding their personal data or providing false data.

Hoffman et al. (1999) also found that 94 percent of web users had declined to provide personal information to web sites at least one time and 40 percent who had provided demographic data had gone to the trouble of fabricating it. Although data security was a major deterrent to providing personal information to web sites, concerns regarding the secondary use of information also discouraged customers from engaging in online exchanges.

The most important thing that can slow down the Internet and e-Commerce growth surge is loss of confidence in company's ability to protect their privacy and to provide secure data

management systems (Keen 2000). Thus, we hypothesize:

H₂: The higher the security provided for customers information by a web site, the higher the e-Trust customers would have for that site.

Web Site Experience

Beyond-the-basic elements that create a distinct web site, branding is what elevates a company from average, to acceptable, and ultimately to memorable. Branding is the first step to loyalty and e-Trust. Having brand name recognition outside of the web will bring shoppers to a company's web site. While they are there, however, the web site must win their loyalty and e-Trust all over again by providing them with consistent and memorable experiences.

To make an e-Commerce site memorable, a company has to manage every touch point (Zemke and Connellan 2001). A touch point is anywhere a customer comes in contact with the company including: the ads, the titles, the links, the search capabilities, and other processes. Think of customer touch points as "moments of truth." Each of them is an opportunity for the customer to make positive or negative judgments about the company.

Branding is about more than a catchy logo or a cool advertisement. Branding is the total customer experience encompassing every step from discovery to purchase to fulfillment and post purchase service (Zemke and Connellan 2001). A well-constructed site is remembered, enjoyed, and talked about. In the similar way, when customers go to a site, curiosity and interest are present almost by definition. They will be delighted if they get the information easily and in a short period of time (Zemke and Connellan 2001). In the global electronic market, however, e-Trust is typically built over time, upon experience, and from repeated interactions (Ba, Whinston and Zhang 1999). If the experience turns out positive, then the customer will come back to engage in repeated transactions. Thus, we hypothesize:

H₃: The more positive memorable experience a customer has with the web site, the higher the e-Trust the customer would have for that site.

METHODOLOGY

Data Collection

Business Administration students were used as subjects for this study. Business students were used for two reasons (1) they are already online users; and (2) previous empirical work has shown that online behavior was not significantly different from a sample of the general population (Gallagher Parsons and Foster 2001). Prior to the survey, the questionnaire was pre-tested to ensure readability and a logical arrangement of questions. Using the revised questionnaire, data were collected from a sample of students in undergraduate marketing classes. A total of 234 questionnaires were found to be complete and usable.

Characteristics of the Subjects

The subjects for the study consisted of slightly more males (51.3 percent) than females (48.7 percent). These percentages matched the student profile of the university. The majority of the subjects were in the age group 19 to 24 years. The household incomes of approximately 68.5 percent of the subjects were less than \$10,000.

Measures

e-Trust. A 5-point interval scale was used to measure e-Trust. The scale ranged from strongly disagree to strongly agree (1= strongly disagree; 5 = strongly agree). The three items, that measured the e-Trust, were related to: (1) loyalty to the web site (E 5a), (2) strong attachment to the web site (E 5b), and (3) feeling of strong attachment to the web site (E 5c).

Web site information. The "Web site information" construct was measured by three

items. The three items used for capturing the web site information were related to: (1) latest information provided by the web site (E 7f), (2) keeps me well informed about the new products/services (E 7g), and (3) keeps me well informed with the current information (E 7h). These items were again measured on a 5-point scale (1=strongly disagree; 5 =strongly agree).

Security of the data. Subjects used a 5-point scale to measure the security of data and information construct. The three items, which measured the security of the data construct, were: (1) concern regarding disclosure of credit card information (E 4g), (2) concern regarding disclosure of financial record (E 4h), and (3) customers’ access to their information (E 4i).

Web site experience. A 5-point scale was used to measure the web site experience construct. The two items that measured how experienced the customers were in using the web site was related to: (1) efficiency in using the WWW (E 2) and (2) Internet usage frequency (E 3). Both the items were measured on a 5 point scale.

Data Analysis

Factor analysis using varimax rotation was used to extract constructs and determine the variance explained. The results of the factor analysis revealed four constructs. The four constructs

accounted for approximately 70.52 percent of total variance. Those results had factor loadings that ranged from 0.61 to 0.91. The results also indicated that Cronbach alpha reliability for the constructs ranged from 0.674 to 0.870, indicating reliability of the items measuring the underlying constructs exceeding the threshold limit of 0.60 in case of exploratory research (Nunnally 1978; Robinson, Shaver and Wrightsman 1991; Hair et al. 1998). Table 1 shows the factor loadings, eigenvalues, and variance explained by the four factors.

Convergent and Discriminant Validity

To test the construct validity, convergent and discriminant validity analyses were performed. Results indicated that the loadings and average variance extracted (AVE) for all four constructs were above the acceptable level. The loadings and AVE of the constructs higher than .60 and .50 respectively are considered good (Bentler 1990; Hair et al. 1998). The results illustrated that all of the constructs under investigation surpassed the acceptable level showing good convergent validity. Table 2 shows the result of the convergent validity of the underlying constructs.

To achieve discriminant validity, the square root of the average variance extracted in

TABLE 1
Factor Loadings, Eigenvalues, and Variance Explained

Factors/Items	e-Trust	Website info	Security of data	Website experience
Strong attachment to the website (E 5b)	0.89			
Feeling of strong attachment (E 5c)	0.87			
Loyalty to the website (E 5a)	0.83			
Latest info provided by the website (E 7f)		0.87		
Well informed about the new product/services (E 7g)		0.83		
Well informed about current info happening around the world (E 7h)		0.61		
Disclosure of financial record (E 4h)			0.91	
Disclosure of credit card info (E 4g)			0.89	
Customers’ access to their info (E 4i)			0.70	
Internet usage frequency (E 3)				0.86
Efficiency in using the WWW (E 2)				0.63
Eigenvalues	3.34	2.05	1.34	1.02
Variance explained	30.41	18.64	12.24	9.23

TABLE 2
Standardized Loadings, Composite Reliability, and Average Variance Extracted (AVE)

Construct	Items	Standardized* loadings	Construct/ composite reliability	Average variance extracted (AVE)
e-Trust (T)	Strong attachment to the website (E 5b)	0.89	0.90	0.75
	Feeling of strong attachment (E 5c)	0.87		
	Loyalty to the website (E 5a)	0.83		
Website info	Latest info provided by the website (E 7f)	0.87	0.82	0.60
	Well informed about the new product/services (E 7g)	0.83		
	Well informed about current info happening around the world (E 7h)	0.61		
Security of data	Disclosure of financial record (E 4h)	0.91	0.88	0.70
	Disclosure of credit card info (E 4g)	0.89		
	Customers' access to their info (E 4i)	0.70		
Website experience	Internet usage frequency (E 3)	0.86	0.72	0.57
	Efficiency in using the WWW (E 2)	0.63		

* All factor loadings are significant at $p = 0.05$

diagonal elements of the matrix should be greater than corresponding off-diagonal elements (correlation among constructs). Discriminant validity is presented in Table 3. It confirms that all of the off-diagonal values were less than the diagonal values which show support for discriminant validity.

Results

A multiple regression model was used for testing the hypotheses. Results indicated that out of the three hypotheses that were tested for significance, two were found to be highly significant in explaining the construct e-Trust (Figure 2): website information (standardized $b = .32$, $p < .01$) and web site experience ($b = .27$, $p < .01$) were found to be predictors of e-Trust. Thus, hypotheses 1 and 3 were supported. However, security of data and information ($b = .07$, n.s.) was not a predictor of e-Trust, offering no support for hypothesis 2. The regression results and the total variance explained by the model are presented in Table 4 and Table 5.

DISCUSSION, CONCLUSION AND FUTURE RESEARCH

Trust is becoming an increasingly important element of the online user experience. This study has identified some of the important determinants of e-Trust. The model presented provides an integrated framework for

developing e-Trust. Such trust has been established over time as being essential for the conduct of business over time. This concept, however, has proved to be more elusive for firms attempting to conduct business on the Internet.

The absence of a tangible experience with the product and a personal interface with the merchant prevents the establishment of the traditional bases for trust. The result is a need for an alternative basis for trust building. The model proposes creating trust in the impersonal setting of a web site is possible when the firm pays strict attention to appropriate surrogate indicators that the site can be trusted. Those surrogate indicators are: information about the products or services provided by the web site, assurances about security of data, and the web site experience itself. In order to generate high levels of trust in a given web site, it should be designed to implement those surrogate indicators in such a way that they discourage consumer skepticism. By reducing consumer skepticism, a site can increase consumers' confidence in the site and subsequently their willingness to not only use it for purchases, but also to provide their personal information.

Based on the model presented, this article argues that the more information on products or services a web site provides to customers and the more easily such information is made

TABLE 3
Discriminant Validity Matrix

Construct	Mean	Standard Deviation	e-Trust	Website info	Security of data	Website experience
e-Trust	3.54	0.82	0.87	0.37	0.13	0.33
Website info	3.74	0.68	0.14	0.77	0.09	0.18
Security of data	4.38	0.56	0.02	0.00	0.84	0.13
Website experience	4.30	0.56	0.11	0.03	0.02	0.75

Diagonal elements represent the square root of the average variance extracted (AVE) between the constructs. The number above the diagonal is the correlation between the constructs. The numbers below the diagonal elements are the shared variance (squared correlations) among constructs. For discriminant validity, diagonal elements should be larger than off-diagonal elements.

TABLE 4
Total Variance Explained by the Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.470(a)	.221	.211	.72767

a Predictors: (Constant), C_W, C_sec, C_info

TABLE 5
Coefficients (a)

Model		Un-standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.052	.524		-.099	.921
	C_info	.379	.072	.315	5.294	.000
	C_sec	.106	.086	.073	1.231	.220
	C_W	.398	.087	.274	4.576	.000

Here: C_info = Information provided by website; C_sec = Security of data; C_W = Website experience

Explanation of Table 5:

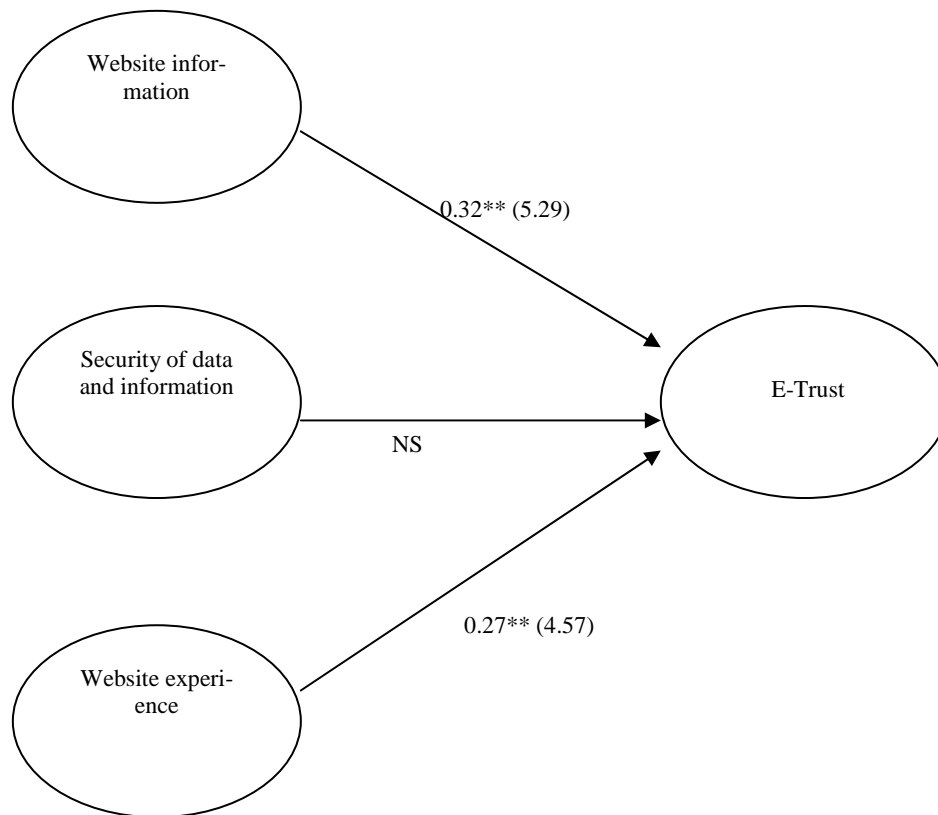
Paths	β	T-value	Sig.
Web info to e-Trust	0.32	5.29	.000
Security of data to e-Trust	0.07	1.23	.220
Web experience to e-Trust	0.27	4.57	.000

Total Variance explained by the Model = 22.1%
Regression Equation for the obtained model:
e-Trust = -.05 + 0.32 (Web info) + 0.27 (Web experience)

available to them, the more likely they are to use that site for purchases. Besides, the more appealing and authentic the information a web site gives to its customers, the higher the level of e-Trust for that site.

Based on the findings of this study, it can be said that both information provided by the web site and the experience that a customer has in using the web site play an important role in generating e-Trust. If a customer uses the web frequently and has a positive experience then he/she is more likely to have a higher level of e-

FIGURE 2
Final Model



** significant at $p < .01$
NS means non-significant

Trust. If the experience turns out positive, then the customer is likely to return again, thus potentially leading to repeated transactions and subsequent development of increased trust in the web site.

The results also indicated that security of data and information were not predictors of e-Trust. The reason could be that even though customers are concerned about security and privacy of their personal information, they implicitly believe that once they share their information with the company it no longer remains secured. For example, in 2005 hackers broke into the customer records at Old National Bank, a US bank. Even though information provided by customers to the bank was considered to be safe, the hacking episode indicated to customers that their information was not really secure. Publicity about such

events could be one of the reasons for non-significance of the path between security and privacy of information to e-Trust. In the present environment it may be presumed by current and potential customers that once their information is given it no longer remains secured.

Future research should be carried out to determine which additional factors may play a role in predicting e-Trust. Since e-Trust is a major concern in today's electronic world, research could also be carried out to learn more about the effectiveness of alternative steps an organization should take to enhance or build trust in their customers' minds. Additional areas for future work include:

- What do users evaluate when ascribing trust to a web site?
- What is the process of development of online trust?

- How can online trust be measured?
- How can trust be facilitated in an online system?

The above list represents some of the important areas which need to be explored. Given the importance and significance of trust in web-related technology, more scholarly work needs to be done in these areas in order to help companies know what things consumers look for when using a particular web site, whether for purchases or for other activities.

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