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The Effect of Perceived Risk on the Intention to Use E-commerce: The Case of Algeria

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Abstract

Despite the recent economic downturn in the Internet and ICT sectors, legitimate concerns regarding privacy and trust remain obstacles to growth and important issues to

both individuals and organizations. Studies on the adoption of business-to-consumer e-commerce have not simultaneously considered trust and risk as important determinants of adoption behavior. The conceptual model of this study leads us to believe that system risks of e-commerce are the major determinants of the adoption behavior. Based on technology acceptance model (TAM), this study aims to investigate the effect of perceived system risk on the behavioral intention of tourism organizations to use e-commerce. This research is expected to provide both theoretical explanations and empirical validation on the adoption of e-commerce, and offer clear explanation and recommendations for business organizations as well as e-commerce systems providers, regarding the adoption of e-commerce and the risk and security issues.

Keywords: System Risk, Trust, Security, E-commerce, Behavioral Intention, Technology Acceptance Model, Perceived Usefulness, Perceived Ease of Use, Algeria

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INTRODUCTION

Despite the recent economic downturn in the Internet and ICT sectors, e-commerce as an information system is expected to continue growing, and corporate websites will remain an important communication channel. However, the main obstacle in the e-commerce applications is the security issue. It is not only major concern among Algerian consumers but of users worldwide. Legitimate concerns regarding privacy and trust remain a barrier to growth to both individuals and organizations. To better take advantage and to be prepared for this electronic phenomenon, organizations need to identify and understand how far perceived system risk may impact executive managers' decisions to engage in web-based e-commerce applications. Recently, the importance of trust has been discussed in both the academic and practitioner press. Broadly defined, electronic commerce can be viewed as any form of economic activity conducted via electronic connections (Wigand, 1997). The focus of this research is tourism organizations that intend to provide online transaction in related to their products and services over the internet, an area of business-to-consumer.

Studies on the adoption of business-to-consumer e-commerce have not simultaneously considered trust and risk as important determinants of adoption behavior. Further, trust in IT has not been addressed to a great extent in the context of e-commerce and its applications within the organizations. Based on technology acceptance model (TAM), this study aims to investigate the effect of perceived system risk on the behavioral intention of tourism organizations to use e-commerce. This research is expected to provide both theoretical explanations and empirical validation and evaluation of role of system risk in influencing the acceptance of e-commerce in the organization.

RISK AND UNCERTAINTY IN THE ELECTRONIC MARKETPLACE

Electronic commerce is a new form of online exchange in which most transactions occur among entities that have never met. As in traditional exchanges,

trust has been considered crucial in the online transaction process perhaps more so given the impersonal nature of the online environment (Brynjolfsson and Smith, 2000). The lean nature of the electronic environment relative to the traditional face-to-face market leads to transaction risks rooted in uncertainty about the identity of online trading parties or product quality. Online trading parties can easily remain anonymous or change their identities. For example, in an auction market where numerous individuals participate in transactions, it is very difficult to bind one identity to one trader. Most auction sites identify sellers or bidders by e-mail addresses, which can be easily obtained for free from multiple sources. Without proper security measures (e.g., seller authentication), it is very easy for a dishonest seller to masquerade as an honest one, luring an unsuspecting buyer into a fraudulent transaction (Neumann, 1997).

Uncertainty about product quality can also be a problem for buyers in the online environment. In a traditional business setting, people get to know the quality of products by "kicking the tires". But when bidders view a product listing at an online auction site, for example, they may not have easy access to information regarding the true quality of the product and therefore may be unable to judge product quality prior to purchase (Fung and Lee, 1999). The difference between the information buyers and sellers possess is referred to as information asymmetry. Buyers in online marketplaces have to rely on electronic information without having the ability to physically inspect the product; hence, they are vulnerable to additional risks because of potentially incomplete or distorted information provided by sellers (Lee, 1998).

While trust is a catalyst in many buyer-seller transactions, it can provide buyers with high expectations of satisfying exchange relationships (Hawes et al, 1989). Koller (1988) argues that trust is a function of the degree of risk inherent in a situation. Trust is especially critical when two situational factors are present in a transaction: uncertainty (risk) and incomplete product information (Swan and Nolan, 1989). Many researchers have argued that an understanding of trust is essential for understanding interpersonal behavior in economic exchanges (Doney, and Cannon, 1997).

Since Bauer (1960) first proposed that behavior can be seen as risk taking, valuable empirical researches have attempted to identify various types of perceived risk in the intention behavior. Pavlou (2002) refers to perceived system risk as the overall amount of uncertainty perceived by an organization in a particular purchase situation. The Perceived Risk associated with online transactions may reduce perceptions of behavioral and environmental control, and this lack of control is likely to negatively influence e-commerce usage intentions (Pavlou, 2003).

RESEARCH MODEL AND HYPOTHESES

E-commerce brings enormous opportunities for both consumers and businesses in the world but not many e-businesses can turn the opportunities into commerce. Lack of trust is one of the most frequently cited reasons for consumers not purchasing from Internet (Lee and Turban, 2002). Thus, our prime focus is to investigate the relationships between system risk, e-commerce usage intention, and the differences of their relationships. The technology acceptance model has its origin in the theory of reasonable action; it represents an important theoretical contribution toward understanding e-commerce usage and its acceptance behavior to measure the intention

of e-commerce usage in the tourism organization mediated by perceived usefulness and perceived ease of use which considered the two intervening variables of the prediction. The technology acceptance model continues to focus on behavioral intention, but with two significant changes that suggest attitude directly influences intention. The first change is that TAM excludes the subjective norm construct included in theory of reasoned action and theory of planned behavior (Ajzen, 1991, Ajzen and Fishbein, 2005). Davis (1989, 2000) suggests that in an organizational setting, individuals may choose to use IT to perform their job, or because their normative referents encourage them to do so. Davis asserts that previous measures of subjective norms are unable to capture the difference between internal motivation and external requirements to comply. The second change is that instead of focusing on general beliefs, TAM includes two new constructs that refer to specific beliefs influencing A toward the intention to use IT. The two new constructs in TAM are:

- Perceived ease of use: "The degree to which the prospective user expects the target system to be free of effort."
- Perceived usefulness: "The prospective user's subjective probability that using a specific application will increase his or her job performance within an organizational context."

Intention to use e-commerce is defined as the organization's perception of both affect and cognition to engage in an online exchange relationship with costumers, such as sharing business information, maintaining business relationship and conducting business transaction (Zwass, 1998)

There is theoretical an empirical support for integrating perceived system risk with TAM variables. Previous research integrates trust with the model, arguing that trust relate to perceived usefulness and ease of use. Gefen and Straub (2002) also integrate trust, perceived usefulness and perceived ease of use in the context of e-services, Pavlou integrate perceived risk with the TAM model constructs (Pavlou, 2003)

Perceived system risk in e-commerce increase behavioral uncertainty and reduce related trust on e-commerce applications that provide online transactions. However, organizations are likely to go with e-commerce application if their risk perceptions and environmental uncertainties are alleviated so that they control over their usage, therefore, the following hypotheses are proposed:

- *H.1 The higher the system risk in tourism organization towards e-commerce, the less e-commerce is perceived to be useful.*
- *H.2 The higher the system risk in tourism organization towards e-commerce, the less e-commerce is perceived to be easy to use.*
- *H.3 The higher system risk in tourism organization towards e-commerce, the less it has intention to use e-commerce.*
- *H.4 There is an indirect negative relationship between system risk and Intention to Use e-commerce through perceived usefulness.*
- *H.5 There is an indirect negative relationship between system risk and Intention to Use e-commerce through perceived ease of use.*

METHOD OF THE EMPIRICAL STUDY

A total of one eighty eight usable respondents were received, out of one hundred and twenty questionnaires distributed to tourism organizations in the two Algerian states, mainly Algiers and Blida. Respondents' profiles are shown in table 1.

Validation items were used to measure the variables in the construct. Although items measuring the dimensions in the constructs have been tested and validated by many previous studies on IT acceptance, the current study re-evaluated these items. The Cronbach's Alpha coefficient for intention to use e-commerce is .961, for perceived usefulness and perceived ease of use is .783 and .807 respectively. For perceived system risk variable, Alpha is .663, which all shows an acceptance range of reliability (Hair et al, 1998).

Table 1: Respondents' Profile

<i>Type of Organization</i>	<i>Percent (%)</i>	<i>Business Activities</i>	<i>Percent (%)</i>
Tour Operator	33.0	Tour Operating	17.0
Tourism Organization	22.7	Inbound Tour	21.6
Travel Agent	42.0	Outbound Tour	1.1
Diving operator	2.3	Ticketing	26.1
		Packages Arrangement	21.6
		Communication Services/ Transportations	12.5
<i>Years of company established</i>	<i>Percent (%)</i>	<i>Education Background</i>	<i>Percent (%)</i>
3-5 years	43.2	Special diploma in the field	51.1
More than 5 years	56.8	Some University	15.9
		Graduated from University	21.6
		Postgraduate University	11.4
<i>Number of Employees in Company</i>	<i>Percent (%)</i>	<i>Age</i>	<i>Percent (%)</i>
Below 5	28.4	30 years or under	42.0
5-50	70.5	31-40 years	45.5
51-100	1.1	41-50 years	11.4
		Over 50 years	1.1

The results further show that all respondents have been using IT in their company, only 3% of the respondents have not yet involved in e-commerce and Internet technology, other respondents' rate vary between 2 to 5 years which show good significant aspect of the actual usage.

HYPOTHESES TESTING

The multiple regression model (Abrams, 1999) was employed to predict the relationship in the construct. Four basic assumptions were met: (1) linearity of the phenomenon

measured. (2) Constant variance of the error terms (homoscedasticity). (3) Independence of the error terms, and (4) normality of error term distribution.

Before the regression results were accepted as valid, the degree of multicollinearity and its effect on the results was examined. The two-part process (condition indices and the decomposition of the coefficient variance) was employed and comparisons made with the conclusions drawn from the variance inflation factor (VIF) and tolerance values. According to Hair et al (1998) the condition indices and VIF not exceeding threshold values of 30 and 10 respectively are most commonly used. There is no high correlation between the independent variables in the regression as all condition indices and VIF fall below the threshold values. Lastly, there was a check for outliers (i.e cases falling at the outer ranges of the distribution). A Threshold of 3 standard deviations was used, which is appropriate for our sample size of 88 to identify outliers. All observations outside this range (3σ) were considered outliers and were duly dropped from the regression.

Table 2: the effect of Perceived System Risk on Perceived Usefulness and Perceived Ease of Use

Perception	Perceived Usefulness			Perceived Ease of Use		
	<i>Beta Coefficient</i>	<i>t-value</i>	<i>p-value</i>	<i>Beta Coefficient</i>	<i>t-value</i>	<i>p-value</i>
Perceived system risk	.463	4.848	.000	.553	6.159	.000
R²	.215			.306		

The coefficient of determination (R^2) for the regression is .215 and .306 for perceived usefulness and perceived ease of use respectively, indicating that 21.5% and 30.6% of the variation in perceived usefulness and ease of use are explained by system risk. The p-value of .000 for both usefulness and ease of use indicates that the higher the system risk in tourism organization towards e-commerce, the less e-commerce is perceived to be useful and the less to be easy to use. Both hypotheses H1 and H2 are then accepted.

Table 3: The Effect of Perceived System Risk on Intention to Use E-commerce Perception

Perception	Intention to Use E-commerce		
	<i>Beta Coefficient</i>	<i>t-value</i>	<i>p-value</i>
Perceived system risk	.371	3.708	.000
R²	.138		

The coefficient of determination (R^2) for this regression is .138, indicating that 13.8% of the variation in intention to transact is explained system risk. The p-value of .000 indicates that the higher the system risk in tourism organization towards e-commerce, the less the organization intention to transact online. Hypothesis 3 is accepted.

Table 4: The Mediating Effect of Perceived Usefulness and Perceived Ease of Use between Perceived System Risk and Intention to Use e-commerce

	Model 1(beta coefficient without usefulness)	Model 2 (beta coefficient with usefulness)
Perceived System Risk	.371 R ² = .138 Adjusted R ² = .128	.316 R ² = .149 Adjusted R ² = .129
	<i>Model 1(beta coefficient without ease of use)</i>	<i>Model 1(beta coefficient with ease of use)</i>
Perceived System Risk	.371 R ² = .138 Adjusted R ² = .128	.244 R ² = .174 Adjusted R ² = .155

The relationship between system risk on one hand and intention to use e-commerce on the other were mediated by perceived usefulness and ease of use. The hierarchical multiple regression model was employed to analyze the indirect relationships hypothesized (Abrams, 1999). The predictor variables (i.e. the independent variables and the intervening variables) were entered into the model in different stages. The hierarchical regression is employed so that the increase in R² corresponding to the inclusion of each category of predictor variables and the inclusion of each category of predictor variables and the unique variance in e-commerce adoption explained by the predictor categorized could be examined. The R² for all sets can be analyzed into increments in the proportion of Y variance due to addition of each new set of predictor variables to those higher in the hierarchy. These increments in R² are squared multiple-partial correlation coefficients. The following general hierarchical model equation for four sets in alphabetical hierarchical order was adopted from Cohen and Cohen (1983):

$$R_{Y^2.TUVW} = R_{Y^2.T} + R_{Y^2.(U.T)} + R_{Y^2.(V.TU)} + R_{Y^2.(W.TUV)}$$

A two model hierarchical regression is adopted in these analyses as suggested above to investigate the mediating effect of perceived usefulness and perceived ease of use between system risk in one hand, and intention to use e-commerce in the other hand, resulting to test our hypotheses H4 and H5.

As we can see from the table above, the beta coefficient for model 1 is significantly higher than of the model 2 in for both variables (i.e. perceived usefulness and perceived ease of use). Coupled also with the increase in R² in both variables explain the mediating effect of usefulness and ease of use on the relationship between system risk and intention to use e-commerce. There is therefore an indirect negative relationship between system risk and intention to use e-commerce via perceived usefulness and perceived ease of use. There is validity for both hypotheses H4 and H5.

DISCUSSION AND IMPLICATIONS

As shown in the results, all of the causal relationships between the constructs postulated by the intention to use e-commerce variables are supported in the Algeria dataset. The results suggest that perceived risk has negative effect on executive managers' intention to use e-commerce

This research attempts to validate perceived system risk as a factor that affects the usage behavior of the tourism organizations in Algeria using the technology acceptance

model (TAM). The results of this study show that all our hypotheses were supported, which revealed the importance of perceived system risk as determinants of e-commerce adoption behavior. When the level of perceived system risk in Algerian tourism organization is high toward e-commerce usage, the usefulness and ease of use of e-commerce would be less perceived in the organizations, the two variables also acted as mediators between perceived system risk and intention to use e-commerce, which shows that perceived risk will have negative effect. These results on Algerian tourism organizations are consistent with the finding of previous research (Pavlou, 2003)

The findings of this study have significant implications in the perspective of research on e-commerce risk that describes the security measures in the e-commerce application in the organizations; it provides also further evidence on the appropriateness of measuring the e-commerce behavior using technology acceptance model (TAM) and its application in organizations. However, this research is considered among the early studies which applied this model on Algerian organizations.

The findings of this study also suggest important practical implications for information systems managers and IT-related businesses currently providing services/products on the Internet as well as those are planning to do so. It is evident from this study that in order to guide to adoption behavior of organizations to use e-commerce, perceived ease of use and perceived usefulness of the e-commerce applications should be enhanced by reducing the lever of perceived risk, information systems managers are willing to be involved in the e-commerce business and use its system when the perceived risk is relatively low. Thus, diminishing such risk is considerably important to e-commerce application providers. To lower the system risk, e-commerce applications providers together with business organizations should establish a robust mechanism which utilizes state-of-art Internet technologies. For e-commerce services providers to business organizations, it is more important for them to place full trust on the privacy, security, integrity and availability that it helps organizations to build the beliefs of ease of use. Further, to reduce system risk in business organization, the e-commerce providers should also build trust in the business organizations in term of support and giving them complete confidence of the usefulness of the e-commerce services they provide.

CONCLUSIONS

Research of organizational acceptance of internet-based e-commerce services may benefit by the inclusion of an operationalization of perceived system risk by improving their understanding of evaluation and adoption patterns of e-commerce by business organizations. From a practical perspective, understanding the cognitive beneath web-based system evaluation and the effect of product trial can enable improved web-systems design. As a result, in order to guide to adoption behavior of organizations to use e-commerce, perceived ease of use and perceived usefulness of the e-commerce applications should be enhanced by reducing the lever of perceived risk, IS managers are willing to be involved in the e-commerce business and use its system when the perceived risk is relatively low. With the projected growth of Internet-based ASP's and web-services, a multi-dimensional measure of adopter's uncertainty and perceived risk should enrich information systems adoption research in Algeria.

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