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Influence of Technical Protections on Consumers' Perceived Security in Electronic Payment System

With the creation of the new freedom economy driven by deregulation, new sources of global competition and ICT revolution commercial transactions are rapidly transitioning from fixed locations, to anytime, anywhere and anyone. Payment systems are a key component of any economic activity and financial system in any country. Efficient payment systems are essential for timely and secure completion of financial transactions, as well as movement of money. A number of e-payment systems have recently emerged on the Internet. However, in comparison to the traditional payment methods, e-payment techniques have several favorable characteristics, including acceptability, privacy, efficiency, and convenience. Since the majority of users of EPS are relatively unfamiliar with the technical details of EPS, they tend to evaluate the security level of EPS on the basis of their experience with user-interfaces. In this paper effect of technical security on consumers' perceived security is discussed.

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Introduction

The emergence of the Internet as a general communication channel has opened the opportunity for Electronic-commerce (EC) to expand worldwide. The proliferation of the Internet and Internet-based economy; extensive use and adoption of information and communication technology (ICT), and the changing consumer process brought about through electronic communities are likely to lead to a new wave of reengineering, reformations, mergers, and acquisitions. This proliferation of EC also significantly affects traditional marketing concepts. Electronic commerce involves the use of information technology to enhance communications and transactions with all of an organization's stakeholders. Such stakeholders include customers, suppliers, government regulators, financial institutions, managers, employees, and the public at large (Deans, 2005).

Electronic Commerce (EC) is where business transactions take place via telecommunications networks, especially the Internet (Turban et al., 1999).

Review of Literature

Electronic Commerce becomes a major component of business operations for many companies, thus e-payment has become one of the most critical issues for successful business and financial services (Hsieh 2001, Peha and Khamitov 2004, Stroborn et al. 2004, Linck et al. 2006, Cotteleer et al. 2007, Kousaridas et al. 2008).

A number of e-payment systems have recently emerged on the Internet. However, in comparison to the traditional payment methods, e-payment techniques have several favorable characteristics, including acceptability, privacy, efficiency, and convenience (Chou et al. 2004, Stroborn et al. 2004, Tsiakis and Sthephanides 2005, Linck et al. 2006, Cotteleer et al., 2007, Kousaridas et al. 2008). Since the majority of users of EPS are relatively unfamiliar with the technical details of EPS, they tend to evaluate the security level of EPS on the basis of their experience with user-interfaces. Thus, to attract and retain e-payment users, it is vital to enhance consumers’ perceptions of security and to
maintain customers’ trust during e-payment transactions (Chellappa and Pavlou, 2002, Stroborn et al., 2004, Tsiakis and Sthepanides, 2005; Linck et al., 2006).

**Research Methodology**

This study developed and implemented a survey of different people from different parts of India. The purpose of this survey was to determine whether the technical protection influences the customers’ perceived security or not.

During the present study, total 234 responses were received through internet, direct investigation etc. Among them 23 questionnaires were found consisting of inappropriate and inadequate responses. Therefore, finally we had total 211 responses for analysis. System

<table>
<thead>
<tr>
<th>Questionnaire items</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survey items for Technical Protection in Electronic Payment System</strong></td>
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<td></td>
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<tr>
<td>It always call for user name and password when you log-in</td>
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<tr>
<td>Various measures are provided by it to authenticate</td>
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<tr>
<td>This offers you an opportunity to change any of payment information before completing the final stage of the payment process</td>
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<tr>
<td>It provides a step to verify a payment before the finalization of the actual payment</td>
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<tr>
<td>This typically displays a summary of the payment information (cost, payee...) and the final payment amount</td>
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<tr>
<td>A confirmation is sent to you through one of several available methods (online, email, etc.) to assure you that the payment has in fact been received</td>
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<tr>
<td><strong>Survey items for perceived security in EPS</strong></td>
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<tr>
<td>I perceive it as secure</td>
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<tr>
<td>I perceive the information relating to user and transactions as secure</td>
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<tr>
<td>The information I provided in previous transaction is helpful for secure payment transactions</td>
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<tr>
<td>I do not fear hacker invasions into it</td>
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</tr>
</tbody>
</table>
Hypothesis Tested

H0: Technical protections are positively associated with consumers' perceived security in Electronic Payment System.

H1: Technical protections are not positively associated with consumers' perceived security in Electronic Payment System.

Hypothesis testing

T-test is used to test hypotheses about the mean for small samples. As known earlier that the t-distribution is symmetric, it resembles the normal distribution and tending toward normal as the sample size increases. During the current study value of t is calculated using formula:

\[ t = \frac{X - Y}{\sqrt{\frac{s^2}{n}}} \]

Where \( X \) = Sum of observations of first variable
\( Y \) = Sum of observations of Second variable
\( n \) = Number of Observations

Value of tabulated t was noted from t-table at 5% level of significance for 20 degrees of freedom. After comparing calculated and tabulated values of t, the result was concluded according to the following:

- If calculated value of \( t > \) tabulated value of \( t \) then Null hypothesis is rejected and alternative hypothesis is accepted.
- If calculated value of \( t < \) tabulated value of \( t \) then Null hypothesis is accepted.

Observations and Results

Technical Security and Respondents

The major security issues at the time of transaction are whether the payment system provides login facility, proper authentication system, modification and verifications facilities and displays Summary and Confirmation messages or not. Thus during the present research these questions were included in the questionnaire. During the present study, it has been observed that among all respondents, 35% strongly agreed and 54% only agreed with the technical security provided at the time of electronic transactions whereas only small number of people (2%) disagreed or strongly disagreed for the same. So almost 89% people believed that technical security is present there in electronic payment system. (Chart I)

Chart I: Technical Security in EPS and Respondents

![Technical Security in EPS Chart](chart_image)
Perceived Security and Respondents

The results shown that among all the respondents only 49% perceived EPS as a secure system whereas 29% did not agree. (Chart II)

Chart II: Perceived Security in EPS and Respondents

Hypothesis Testing Results and Conclusion

H0: Technical protections are positively associated with consumers' perceived security in Electronic Payment Systems.

H1: Technical protections are not positively associated with consumers' perceived security in Electronic Payment System.

To check this, two variables were taken: Technical Protections which includes six basic questions as explained earlier and Perceived security which includes four questions. After conducting t-test, value of $t = 1.897077$ was obtained.

<table>
<thead>
<tr>
<th>For Electronic Payment System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computed value of $t$</td>
</tr>
<tr>
<td>Tabulated value of $t$ at 5% level of significance for 20 degree of freedom</td>
</tr>
</tbody>
</table>

On comparing the computed value of $t$ with the tabulated value of $t$, it has been observed that the calculated value of $t < $ tabulated value of $t$. thus H0 is accepted. So it was concluded that technical protections are positively associated with consumers’ perceived security in Electronic Payment System. Similar results were recorded by different researchers.(Prime Ministry of Turkey, 2002, Tagmac, 2003, Turkstat,2007). Consumers’ perceived security is positively related to Electronic Payment System use (Anderson and Weitz, 1989, Reichheld and Schefter, 2000). Finally, research believed that consumers’ perceived trust also has a positive impact on Electronic Payment System use. The results are unfailing with the findings of the previous research (Culnan and Armstrong, 1999, Miyazaki and Fernandez 2000, Kim et. al, 2010).
References
