Electronic Payment Systems Evaluation: A Case Study to Examine System Selection Criteria and Impacts

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ABSTRACT
As e-commerce is increasingly critical to organizational survival in the 21st century global marketplace, business organizations are challenged with selecting the best payment alternatives to meet both their requirements and the needs of their customers. This paper develops and validates a performance-based tool, the Electronic Payment Efficacy Quotient (EPEQ), designed to assist merchants in selecting the appropriate EPS and measuring effectiveness. The research aims at addressing the need for EPS research to aid merchant selection and use of EPS. The paper presents the case study of a single source Internet Service Provider (ISP), which was analyzed to determine merchant’s needs regarding EPS and develop measures. Historical data was then used to determine and test the validity of the most effective alternative measures. The paper concludes with recommendations for future research to assist in optimizing merchant use of EPS.

Keywords: E-Commerce, Electronic Payment Efficacy Quotient, Electronic Payment Systems, Merchant Payment Systems, Selection Criteria

INTRODUCTION
As e-commerce is increasingly critical to organizational survival in the 21st century global marketplace, business organizations are challenged with selecting the best payment alternatives to meet both their requirements and the needs of their customers. Because e-commerce is built on a model that consists of buying and selling through computer networks (Vassiliou, 2004; Ngai & Wat 2002), ecommerce transactions involve little or no personal contact among participants (Holden, 2010). Without personal face-to-face contact, verifying the availability of funds and collecting payments can be difficult for merchants. Since fund verification and collection are essential to the economic viability of online merchants (Meng, Zhang, & Xiong, 2005; Hoang, 2009; Dani et al., 2005; Khazanchi, 2005), choice of Electronic Payment System (EPS) has been described as one of the most important decisions made by electronic commerce merchants (Vassiliou, 2004). Evaluation and measurement of payment

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systems are essential to ensure that positive effects are achieved through EPS implementation and use (Dahlberg & Oorni, 2007). Currently, EPS performance measurement models do not provide the multiple measures, information, and tools necessary for merchants to optimize EPS selection and use (Perrin & Pervan, 2009).

Selection of EPS is becoming more complex due to the development of numerous affordable and secure payment systems, but there is little research on EPS focused on the merchant’s perspective (Dahlberg et al., 2007; Perrin & Pervan, 2009). Research on EPS has lagged behind merchant use of systems (Medvinsky & Neuman, 1993). Evaluation of EPS in real time requires development of tools that merchants can use for their own practical evaluation, but there are not defined standards to evaluate and measure the viability of EPS from the merchant perspective (Medvinsky & Neuman, 1993; Dahlberg et al., 2007). In a study of stakeholder perspectives in relationship to EPS costs, benefits and, requirements, Hoang (2009) describes the problems that arise due to the lack of standards. The research revealed that conflicting interests by the parties led to trade-offs in the development of an EPS, rather than decision-making that revolved around specified desired criteria (Hoang, 2009).

This article explores EPS to develop and validate a performance-based tool, the Electronic Payment Efficacy Quotient (EPEQ), designed to assist merchants in selecting the appropriate EPS and measuring effectiveness. The research presented in this article aims at addressing the need for EPS research to aid merchant selection and use of EPS. The next sections describe EPS and reviews relevant EPS literature and research. The paper then presents the case study of a single source Internet Service Provider (ISP), which was analyzed to determine merchant’s needs regarding EPS and develop measures. Historical data was then used to determine and test the validity of the most effective alternative measures. The paper concludes with recommendations for future research to assist in optimizing merchant use of EPS.

**Background**

The change in venue from face-to-face to electronic interactions has created a number of financial processes to transfer funds, secure transactions, and protect of sensitive financial information (Hoang, 2009). The processes cannot be fulfilled by the use of conventional modes of payment such as cash, checks and credit cards and are the primary reason for the emergence and fast growth of EPS (Holden, 2010). The lack of a face-to-face interaction in the e-commerce transaction necessitates processes to transfer funds, secure transactions, and protect of sensitive financial information (Hoang, 2009). Because electronic funds transfers involve private and financial information being transmitted through the worldwide web, often through international banks, the need for security and protection during the transaction process is paramount (Hoang, 2009).

Electronic payments involve the interface of five primary entities including business entities such as (1) consumer and (2) merchant, financial entities such as (3) issuer and (4) acquirer, and (5) a payment system provider. The payment system provider is a secure entity that performs the electronic payment transactions which link the issuer and the acquirer on the internet side to the client and merchant on the private banking and network side (Gervasi et al., 2008). The EPS facilitates the transfer of hard currency from the customer to the merchant by using a secure, effective and efficient system through either an intermediary or electronic currency (Vassiliou, 2004). The way such a transaction occurs is fairly straightforward. Following the initiation of the transaction, the appropriate accounts representing the notational money are adjusted between the buyer and the seller’s accounting systems (i.e., banks or financial institutions), having passed through the intermediary. EPS can change with evolving technology and include a variety of physical or conceptual “third party” intermediaries, either agents or currency. Due to the variety of payment systems offered – ranging from traditional means such credit cards, debit cards, automatic teller
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