

# E-Commerce and Mobile Commerce Applications Adoptions

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## INTRODUCTION

E-commerce applications are primarily used at home and in the workplace. Utilitarian elements, including cognitive beliefs of perceived usefulness, perceived ease of use (at the individual level), industry pressure, organizational readiness, economics, and trust (at the business level) are key determinants contributing to the usage of e-commerce applications. Mobile devices redefine the meaning of workplace. The use of mobile services could be in and outside the workplace. Hedonic elements, such as fun, culture, life style, and hype are key determinants contributing to the usage of mobile commerce applications. The purpose of our article is to discuss and clarify immediate determinants of e-commerce and mobile commerce applications based on the technology acceptance model.

## BACKGROUND

A joint study by eMarketer and Forrester (2005) estimates that business-to-customer (B2C) revenues in the U.S. will reach \$229.9 billion by 2008 and business-to-business (B2B) revenue will reach \$8.8 trillion in 2005. According to the Computer Industry Almanac (ClickZ Stats, 2005), by 2007 the number of Internet users will grow to 1.46 billion worldwide with the U.S. market representing only about 20% of worldwide Internet users. It is clear that e-commerce (EC) is becoming a global transactional forum.

Along with the dominance of EC comes an increased demand for mobile commerce (MC). The total number of mobile telephone subscribers in the world grew to 1.34 billion in 2003 from 317 million in 1998 (International Telecommunication Union, 2003). More than half of Americans (158 million) were mobile telephone subscribers in the United States. Unlike EC, only a very limited number of MC applications are making profit (Beck & Wade, 2002). The difference in the adoption pattern of EC and MC prompts practical reasons as well as research motives to investigate what drive consumers to purchase or use a particular EC and MC application.

The goals of adoption of EC and MC applications can be grouped into two broad categories: utilitarian (productivity-oriented) and hedonic (pleasure-oriented). *Utilitarian* elements are those determinants of productivity and usefulness that should be considered by a rational user or company before deciding to adopt a particular EC or MC application. For instance, an individual uses e-banking and online job search engine to improve personal productivity. A company adopts e-marketplace or Internet EDI applications to improve operational efficiency, reduce cost, and increase customer services. *Hedonic* elements are those determinants that are associated with personal enjoyment and pleasure. (See Table 1.) A user subscribes to a gaming or dating service to meet friends who share common interests. Knowing the dichotomizing difference between utilitarian and hedonic goals can help us understand why we accept a particular EC or MC application.

## E-COMMERCE AND M-COMMERCE ADOPTION

### E-Commerce Adoption

Electronic commerce (EC) refers to electronic business with a broader meaning than just buying and selling on the Internet. EC is the process of transacting, transferring, or exchanging products and services over communication networks, including the Internet (Turban, King, Lee, & Viehland, 2004). Note that the underlying network may encompass different broadband (i.e., > 1 Mbps) segments such as DSL, cable modem, power line, Asynchronous Transfer Mode (ATM), and Gigabit Ethernet. Straub (2004) defined all forms of EC organizations as Net-enhanced organizations. Many EC applications are available to support the operation of Net-enhanced organizations. EC applications that are widely adopted at the individual level include e-tailing, Internet marketing, online travel services, online banking, e-grocery, online gaming, e-auction, etc. EC applications at the business level facili-

Table 1. Summary of utilitarian and hedonic factors of EC and MC adoption

	E-Commerce	M-Commerce
Utilitarian Factors (Firm)	Industry pressure, organizational readiness, perceived benefits, trust	Critical mass, perceived benefits
Utilitarian Factors (Individual)	Perceived ease of use (PEOU), perceived usefulness (PU)	Perceived ease of use (PEOU), perceived usefulness (PU), cost, perceived system quality
Hedonic Factors (Individual)	Perceived playfulness, perceived enjoyment, network size, perceived user resources	Social influence, entertainment, hype, lifestyle

tate the inter- and intra-organizational transactions over communication networks.

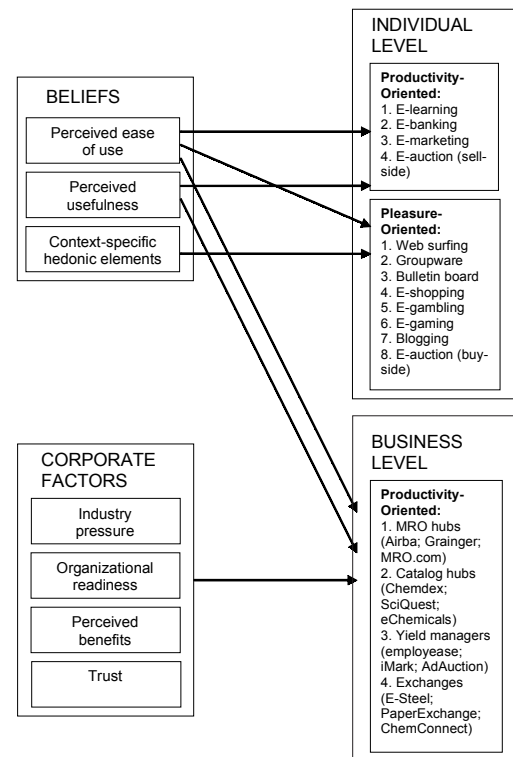
There are four basic types of B2B applications: sell-side market, buy-side market, many-to-many marketplaces, and collaborative commerce (Turban & King, 2003). Sell-side applications comprise of online catalog (e.g., Cisco's Connection Online service), e-auction, and online intermediary (e.g., Boeing's Part Analysis and Requirement Tracking service). Buy-side applications are primarily e-procurement management (e.g., Schlumberger's Oilfield Services), internal and external aggregation (e.g., Grainger.com and allbusiness.com), reverse auctions, and e-bartering. Many-to-many marketplaces allow many buyers and sellers to conduct transactions in an online public or private marketplace (e.g., epapertrade.com, mro.com, chemconnect.com, and employease.com). Collaborative commerce enables business partners to collaborate with each other by engaging in non-transactional activities.

Factors driving the adoption of EC applications can be examined at two levels of analysis: individual and business. At the individual level, both utilitarian and hedonic factors are responsible for customers' adoption of EC applications. At the business level, utilitarian factors (organizational productivity) are primarily responsible for adoption in for-profit and not-for-profit organizations (Figure 1).

### Utilitarian and Hedonic Perspectives of Adopting EC Applications

The Technology Acceptance Model (TAM) (Davis, 1989) is recognized as the most robust and influential model that predicts an individual's adoption behavior of information technology (Davis, Bagozzi, & Warshaw, 1992; Venkatesh & Morris, 2000). At the individual level, the TAM provides a utilitarian perspective of EC adoption. This model asserts that perceived ease of use (PEOU) and perceived usefulness (PU) are important in forming customer attitude, satisfaction, and trust towards EC applications

Figure 1. Immediate determinants for the adoption of EC applications



(Devaraj, Ming, & Kohli, 2002). Favorable attitude, satisfaction, and trust can lead to the adoption of EC applications. These two cognitive beliefs—PEOU and PU—have adequately explained the widespread adoption of personal productivity-oriented EC applications (i.e., most B2C applications).

However, the TAM is weak in explaining hedonic EC applications. Many studies extended the model to correct the weakness. For instance, along with PEOU and PU, perceived playfulness (Moon & Kim, 2001) and perceived enjoyment (Davis, Bagozzi, & Warshaw, 1992; Teo, Lim, & Lai, 1999) are immediate determinants for the adoption of the Internet. Perceived critical mass or network size is another complementary factor for the adoption of online groupware (Luo & Strong, 2000). Perceived user resources is the immediate determinant for the adoption of bulletin board system (Mathieson & Chin, 2001). Compatibility (Chen, Gillenson, & Sherrell, 2002) and intrinsic motivation of online users (Venkatesh & Morris, 2000) directly result in the adoption of virtual stores (Chen, Gillenson, & Sherrell, 2002). Social influence and flow experience are direct causes of the adoption of online activities that require the total involvement of online users, such as betting on sports events, gambling (Hsu & Lu, 2004), and shopping online.

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