

## Chapter 16

# A Cloud Computing–Based Model of E–Commerce Adoption for Developing Countries

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### **ABSTRACT**

*While e-commerce can contribute significantly to the economies of developing countries, challenges may include a lack of telecommunications infrastructure, low Internet and credit card penetration, lack of skilled professionals and insufficient delivery systems. Cloud computing offers a solution to most of these challenges, providing access to a low-cost, reliable and flexible internet-based infrastructure. However, there is little empirical validation of the adoption of cloud computing in e-commerce; to bridge that gap, the present study proposes a cloud-based model of e-commerce adoption. Based on a survey of leaders of 175 small, medium, and large ICT firms in Egypt, a developing country where e-commerce is expected to boom in the coming years, the proposed model empirically validates organizational, technical and contextual factors that would make e-commerce adoption more effective for business, governments and service providers.*

### **LITERATURE REVIEW AND RESEARCH MOTIVATION**

#### **E-Commerce Adoption in Developing Countries**

Several studies of e-commerce adoption in developing countries have emphasized the effect of contextual factors such as technological, economical, legal and financial infrastructures (Travica et al., 2002; Jennex et al., 2002) while others have looked at managerial and organizational factors affecting the adoption decision (Daniel et al., 2002). Molla and Licker (2005a, 2005b) developed the Perceived E-Readiness Model (PERM) for e-commerce in developing countries, integrating contextual and organizational factors. That model considers a number of internal organizational factors (e.g. organization's perception of e-commerce and its potential benefits and risks, managers' commitment, resources), as well as contextual

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factors (e.g. government support, market forces, support industries' e-readiness) as important elements in e-commerce adoption. PERM has been validated as an effective e-commerce adoption model in a number of countries, including China (Tan et al., 2007), Bahrain (Ali et al., 2014) and Iran (Fathian et al., 2008). These studies highlighted critical issues for e-commerce e-readiness, including organizational features, technology infrastructures, IT availability and security environment.

However, all of the above studies are limited by their failure to address important organizational factors, such as Internet-based technology innovations currently adopted in these countries that can significantly impact e-commerce. In Egypt, e-commerce remains underdeveloped; according to the Egypt Business Directory (El-Behary, 2015), despite a 400% increase in Internet penetration between 2004 and 2015 to 31 million Internet users, only 2% of those users shopped online in 2015, and 80% paid on delivery. One key challenge for e-commerce in Egypt is low credit card penetration. In 2015, only 7% of Egyptians had a bank account, and only 7.6 million had a credit or debit card (El-Behary, 2015). This is expected to change during the next decade, with a massive increase in pre-paid and credit card penetration accompanying an e-commerce boom (El-Behary, 2015). The Internet contribution to GDP is projected to rise significantly to 1.6% of GDP in 2017 (Boston Consulting Group, 2012).

Other challenges obstructing e-commerce development in Egypt include a lack of technological infrastructure and the weak readiness of support industries like banking and tax and customs administrations (El-Behary, 2015). In similar countries, such as the Kingdom of Saudi Arabia, the lack of clear regulations and government support are thought to be key influences on e-commerce adoption (Al-Ghamdi et al., 2011). However, explanations of low e-commerce penetration within this fast-growing Internet population have not been empirically tested, and nothing is known about organizational, individual, contextual and technological factors affecting e-commerce adoption in Egypt.

## **Cloud Computing Adoption and E-Commerce**

The importance of investment in cloud computing (CC) technology for conducting business has been widely acknowledged (e.g. Armbrust et al., 2010). As well as reducing cost, this Internet-based innovation can enhance the reliability, availability and flexibility of e-business (Tuncay, 2010). Like electricity, water, gas and telephony, which are accessed so frequently that they are always-on and paid for by consumer usage, CC is expected to become the fifth utility (Misra et al., 2011).

Among studies of CC adoption in technologically developing communities, Low et al. (2011) conducted a questionnaire-based survey of 111 high-tech firms in Taiwan. Their findings revealed that technological context (relative advantage, complexity and compatibility) and organizational context (top management support, firm size and technology readiness) significantly affect CC adoption. Investigating CC adoption in Saudi Arabia, Alhammedi et al. (2015) found that security concerns and government support were more influential than in technologically developed countries.

Few cost-benefit analyses have provided direct costings of CC implementation (Maheswaran, 2008; Schadler, 2009), and ROI has rarely been calculated (Misra et al., 2011). Some models suggest that cloud pricing makes it more suitable for small and medium rather than larger enterprises (Alhammedi et al., 2015). However, there is also evidence that CC capability contributes to e-commerce competitive advantage by enhancing methods of buying, selling and dealing with customers (Armbrust et al., 2010). Theoretically at least, cloud computing technology can address many e-commerce challenges through high service and infrastructure performance, cost savings and business security (Shah, 2014). To the best

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