

# Systems Development Methodology for Mobile Commerce Applications

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## ABSTRACT

*There are several methodologies, including traditional and agile methodologies, being utilized in current systems development. However, it could be argued that existing development methodologies may not be suitable for mobile commerce applications, as these applications are utilized in different contexts from fixed e-commerce applications. This study proposes a system development methodology for mobile commerce applications. In order to achieve this aim, four objectives are proposed: investigating existing systems development methodologies used to develop mobile commerce applications, identifying strengths and weaknesses of existing development methodologies, construction of a suitable methodology for mobile commerce applications, and testing for its applicability and practicality. The research methodology used in the study is the design research, which includes the steps of awareness of problems, suggestion, development, evaluation and conclusion. However, this paper only focuses on the first two phases of the whole study, which are awareness of the problem and making suggestions, while the evaluation and conclusion will be conducted as future works.*

*Keywords: Development Methodology, Mobile Applications, Mobile Commerce, Mobile Computing, Systems Development*

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## INTRODUCTION

Mobile commerce or commonly known as m-commerce, typically designates the use of wireless devices (particularly mobile phones) to conduct electronic business transactions, such as product ordering, fund transfer, and stock trading, (Kalakota & Robinson, 2002). According to Liang, Huang, Yeh, and Lin (2007), mobile commerce refers to any transactions, either direct or indirect, via mobile devices,

such as phones or Personal Digital Assistants (PDAs). While many different definitions of mobile commerce exist in the literature (Truel & Yuan, 2006), these usually refer to e-commerce activities conducted through mobile devices such as mobile phones and Personal Digital Assistants (PDAs).

Mobile commerce is viewed as the next generation e-commerce (Liang et al., 2007). With the rapid proliferation of mobile devices, including mobile phones, PDAs, and handheld computers, mobile commerce is widely considered to be a driving force for next generation

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e-commerce (Liang & Wei, 2004). It is therefore necessary to investigate how to design and develop mobile commerce applications to ensure the successfulness of their deployment. The power of m-commerce is primarily due to the anytime-anywhere connectivity of wireless devices, which provide enormous opportunities for business process innovation and location-sensitive services (Zwass, 2003). And with the increasing popularity of mobile appliances, the most effective means of providing these services in a wireless mobile environment should be found (Zhou, Islam, & Ismael, 2004). However, careful consideration should be taken when developing mobile commerce applications since they are utilized in different contexts from those typical e-commerce, they are mobility and portability.

There are several systems development methodologies including traditional and agile methodologies which are being utilized in current systems development (Blum, 1996; Highsmith, 1999; Krutchen, 2001; Cao & Ramesh, 2007). However, based on the analysis of the related literature, it could be argued that existing development methodologies may not be suitable for mobile commerce applications as these applications are utilized in different contexts from typical ecommerce applications such as they are displayed on a small screen device, they are utilized in an unstable or movable environment and they need to be used in a secured environment to deliver financial transactions over mobile network (Varshney & Vetter, 2002; Tarasewich, 2003; Lee & Benbasat, 2004; Khalifa & Shen, 2008).

There are many research problems which are related to m-commerce applications and services that are raised by researchers. One of them is proposed by Varshney and Vetter (2002) who argue that there is a need for a research to identify strategies and methodology that carriers, vendors, providers, and managers can use in the development of m-commerce applications and services. Henceforth, this study attempts to partly tackle this issue by examining and investigating the suitable system development

methodology for mobile commerce applications which carriers, vendors, providers, and managers can utilize. The system development methodology to be proposed should conform to the most significant features of mobile technology, which are mobility and portability (Liang et al., 2007).

Ngai and Gunasekaran (2007), on the other hand, found that if considering the research published in the field of mobile commerce theory and research, it was revealed that the research in the field of development of m-commerce applications and guidelines is only 7.7% comparing to 30.7% in m-commerce behavioral issues (consumer behavior, acceptance of technology, and diffusion of technology), 29.2 in m-commerce economics, strategy and business models, 10.7% in m-commerce legal and ethical issues, and 21.77% in m-commerce overview, context, and usage. Thus this number illustrated that there is a research gap in the field of the development of m-commerce applications and guidelines and henceforth this research area should be examined to fill the knowledge gap.

In order to construct the suitable development methodology for mobile commerce applications, there are several areas to be focused including existing systems development methodologies, mobile commerce, mobile commerce applications, mobile devices and mobile networking. With these related subject areas, there are several issues that should be addressed. In particular, as these applications hold e-commerce activities conducted through mobile devices such as mobile phones and Personal Digital Assistants (PDAs), it therefore poses several development issues (Turel & Yuan, 2006) that will be addressed in this study which include:

- The context awareness issue in the analysis phase of development process.
- Integration of the principles of user interface design for small screen mobile device hardware in the design phase of development process.

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