Chapter 9

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.

INTRODUCTION

Mobile commerce, 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, (Kalkota & 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 litera-
ture (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 gen-
eration 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 e-commerce
(Liang & Wei, 2004). It is therefore necessary to
investigate how to design and develop mobile com-
erce applications to ensure the successfulness of
their deployment. The power of m-commerce is
primarily due to the anytime-anywhere connectiv-
ity of wireless devices, which provide enormous
opportunities for business process innovation
and location-sensitive services (Zwass, 2003).
And with the increasing popularity of mobile ap-
pliances, 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 meth-
odologies including traditional and agile method-
ologies 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 method-
odologies may not be suitable for mobile commerce
applications as these applications are utilized in
different contexts from typical e-commerce ap-
plications 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 develop-
ment of m-commerce applications and services.
Henceforth, this study attempts to partly tackle
this issue by examining and investigating the suit-
able 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 pub-
lished in the field of mobile commerce theory and
research, it was revealed that the research in the
field of development of m-commerce applica-
tions and guidelines is only 7.7% comparing to
30.7% in m-commerce behavioral issues (con-
sumer 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 applica-
tions, mobile devices and mobile networking.
With these related subject areas, there are several
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