Chapter 76
Emerging Technologies for User-Friendly Mobile Payment Applications

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ABSTRACT

The advancement and the evolution of mobile communications and mobile device technology have led to a remarkable growth and tremendous requirement for mobile applications that are carried on mobile phones. These technologies have lead to the deployment of business, communications, and mobile services, and hence, gave rise to mobile payments. The mobile payments are considered as the killer applications and are real-time cashless payments. Mobile payments take place with the help of mobile telephony and communications where maintaining security solutions becomes an important factor. This chapter describes the different emerging technologies carried out between a resource-limited mobile device and a resource-rich computer server over wireless networks.

1. INTRODUCTION

The essence of mobile technology revolves around the idea of reaching customers, suppliers, and employees regardless of where they are located. Mobile technologies are about delivering the right information to the right place at the right time. It gives users the ability to access the Internet from any location at any time, the capability to pinpoint an individual mobile terminal user’s location, the functionality to access information at the point of need, and a need-based data/information update capability. A mobile technology is not just evolution of communication technologies but combines the advantages of mobile communications with existing electronic communications services. There are some specific attributes of mobile technology, such as mobility, reachability etc. Mobile technology is a broad category that includes all devices, protocols and infrastructures that allow one to communicate, interact and exchange data with an individual or system anywhere and anytime. Examples include mobile phones, PDAs (Personal Digital Assistants). For mobile technology, the major characteristics are mobility and reachability. Mobility implies that users can carry cell phones or other mobile devices to transact from anywhere in mobile network area. Reachability of the wire-
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less devices makes it possible for people to be contacted anytime and anywhere and provides users with the choice to limit their reachability to particular persons or times. Mobile commerce has features not available to traditional e-commerce. In addition to reachability and mobility others feature are described as follows:

1. **Ubiquity**: It is the primary advantage of mobile telephony. Users can get any information that they are interested in, whenever they want regardless of their location, through Internet-enabled mobile devices. In mobile applications, users may be engaged in activities, such as meeting people or travelling, while conducting transactions or receiving information. In this sense, mobile communications makes a service or an application available wherever and whenever such a need arises.

2. **Localization**: The knowledge of the user’s physical location at a particular moment also adds significant value to mobile commerce. With location information available, many location-based applications can be provided. For example, with the knowledge of the user’s location, the mobile service will quickly alert him/her when his or her friend or colleague is nearby. It will also help the user locate the nearest restaurant or ATM. Positioning technologies, such as the Global Positioning System (GPS), allow companies to offer goods and services to the user specific to his current location. Location based services can be, thus, offered to meet consumers’ needs and wishes for localised content and services.

3. **Personalization**: An enormous number of information, services, and applications are currently available on the Internet, and the relevance of information users receive is of great importance. Since owners of mobile devices often require different sets of applications and services, mobile applications can be personalized to represent information or provide services in ways appropriate to a specific user.

4. **Dissemination**: Some wireless infrastructures support simultaneous delivery of data to all mobile users within a specific geographical region. This functionality offers an efficient means to disseminate information to a large consumer population.

5. **Flexibility**: Users of mobile devices should be able to engage in activities such as, receiving information, and conducting transactions with ease.

6. **Immediacy**: Closely related to the feature of ubiquity is the possibility of real time availability of services. This feature is particularly attractive for services that are time-critical and demand a fast reaction, e.g. stock market information for a broker. Additionally, the consumer can buy goods and services, as and when he feels the need. The immediacy of transaction helps to capture consumers at the moment of intention so that sales are not lost in the discrepancy between the point of intention and that of the actual purchase.

7. **Instant Connectivity**: With the introduction of the General Packet Radio Service (GPRS) mobile devices are constantly online, i.e. in touch with the network. This feature brings convenience to the user, as time-consuming dial-up or boot processes are not necessary.

8. **Pro-Active Functionality**: A mobile application opens, by the virtue of its ability to be immediate, local and personal, new avenues for push-marketing, such as content and product offers. Services like Opt in advertising can be offered, so that a user may choose the products, services and companies, which he wants to be kept informed about. The Short Message Service (SMS) can be used to send brief text messages to consumers informing them of relevant local offerings that best suit their needs. This feature ensures that the relevant information can be provided to the...
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