

Mobile Commerce Multimedia Messaging Peer

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INTRODUCTION

In a mobile-commerce world, shops could provide product brochures, cards, sounds, songs and so forth in the form of multimedia messaging presentations, which could be used by a customer to send to friends. Shopping malls will have information kiosks equipped with wireless access capabilities, and could perform searches across the mall's network to update its multimedia message repository. Customers can download and distribute to their friends such multimedia content via mobile messaging, leading to increased revenue for the shops.

Over the years, mobile messaging has become an essential means of communication, and it is going to be even more so with the merging of the Internet and Mobile Networks. The ability to message from a phone to a computer on the Internet and vice versa is making messaging a powerful means of communication (Yeo, Hui, Soon, & Lau, 2001).

This article discusses the development of a multimedia messaging client for a personal digital assistant (PDA) and a Kiosk providing multimedia messages composition, search, share and send capabilities. Various messaging technologies, enabling wireless technologies and the peer-to-peer model, are also discussed and evaluated in this article. We substantiate the ideas discussed in this article with a description of an MMS PDA client application using JXTA with specific references to a shopping mall scenario.

BACKGROUND

Short Messaging Service

Text messaging uses the short messaging service (SMS, 100-200 characters in length), and involves sending text messages between phones. Examples include "CUL8ER" and "OK. AT FLAT OR OFFICE." It is quick and dirty, hard to use the keypad, abrupt, punctuation challenged and incredibly useful and popular. Text messaging also has a

lot of advantages, such as its convenience, availability on all phones and discreteness.

Text messaging is most prevalent in the youth market (Tan, Hui, & Lau, 2001), and especially teenagers, who are able to manipulate the difficulty of entering text with the mobile phone keypad. In fact, it is suspected that this steep learning curve and the necessary insider knowledge are two of the things that appeal to the youngsters (Bennett & Weill, 1997).

Multimedia Messaging Service

The multimedia messaging service (MMS), as its name suggests, is the ability to send and receive messages comprising of a combination of text, sounds, images and video to MMS-capable handsets (MMS Architecture, 2002). The trends for the growth in MMS are taking place at all levels within GSM (Patel & Gaffney, 1997), enabling technologies such as GPRS, EDGE, 3G, Bluetooth and Wireless Access Protocol (WAP).

MMS, according to the 3GPP standards, is "a new service, which has no direct equivalent in the previous ETSI/GSM world or in the fixed network world." Here is an introduction to the features of this innovative new service:

- MMS is a service environment that allows different kinds of services to be offered, especially those that can exploit different media, multimedia and multiple media.
- MMS will enable messages to be sent and received using lots of different media, including text, images, audio and video.
- As more advanced media become available, more content-rich applications and services can be offered using the MMS service environment without any changes.
- The MMS introduces new messaging platforms to mobile networks in order to enable MMS. These platforms are the MMS Relay, MMS Server, MMS User Databases and new WAP Gateways.

Table 1. SMS vs. MMS

Feature	SMS	MMS
Store and Forward (non real time)	Yes	Yes
Confirmation of Message Delivery	Yes	Yes
Communications Type	Person to person	Person to person
Media Supported	Text plus binary	Multiple-text, voice, video
Delivery Mechanism	Signalling channel	Data traffic channel
Protocols	SMS specific, e.g. SMPP	General Internet, e.g. MIME SMTP
Platforms	SMS Center	MMS Relay plus others
Applications	Simple person to person	Still images

- MMS will require not only new network infrastructure but also new MMS-compliant terminals. MMS will not be compatible with old terminals, which means that before it can be widely used, MMS terminals must reach a certain penetration.

Implications of SMS on MMS

The current SMS has some unique advantages that other non-voice services do not have, such as store and forward and confirmation of message delivery. However, SMS also has some disadvantages, such as limited message length, inflexible message addressing structures and signalling channel slowness.

Person-to-Person (P2P) Model

Today, the most common distributed computing model is the client-server model (Chambers, Duce, & Jones, 1984). In the client-server architecture, clients request services and servers provide those services. A variety of servers exist in today's Internet: Web servers, mail servers, FTP servers and so forth. The client-server architecture is an example of a centralized architecture, where the whole network depends on central points to provide services. Regardless of the number of clients, the network can exist only if a server exists (Berson, 1992).

Like the client-server architecture, P2P is also a distributed computing model (Yemini, 1987). However, the P2P architecture is a decentralized architecture where neither client nor server status exists in a network (Madron, 1993). Every entity in the network, referred to as a peer, has equal status, meaning that an entity can either request a service (a client trait) or provide a service (a server trait). Figure 1 illustrates a P2P network.

Though peers all have equal status in the network, they do not all necessarily have equal physical capabilities. A P2P network might consist of peers with varying

capabilities, from mobile devices to mainframes (Budiarto & Masahiko, 2002). A mobile peer might not be able to act as a server due to its intrinsic limitations, even though the network does not restrict it in any way.

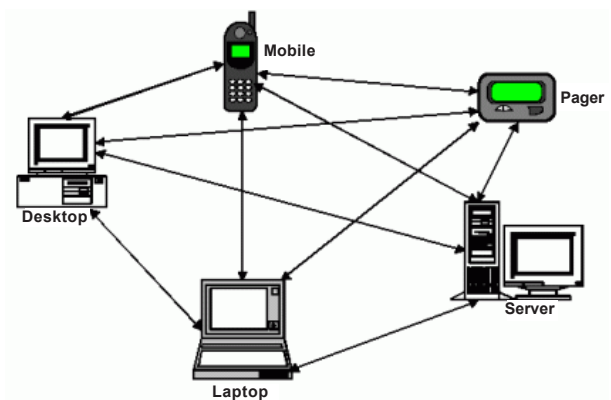
JXTA

Jxta strives to provide a base P2P infrastructure over which other P2P applications can be built (Project Jxta, 2002). This base consists of a set of protocols that are language independent, platform independent and network agnostic. These protocols address the bare necessities for building generic P2P applications (Jxta Technology Overview, 2002). Designed to be simple with low overheads, the protocol's target is to build, to quote the Jxta vision statement, "every device with a digital heartbeat."

JXTA vs. .NET and JINI

Jxta's XML-based messaging is similar to Microsoft's .Net and SOAP technologies. But that is a very thin foundation for comparison. As more and more third-party protocols make use of XML, it will become obvious that

Figure 1. P2P model



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