

Chapter 3.1

Wireless Technologies to Enable Electronic Business

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INTRODUCTION

Research and practices in electronic business (e-business) have witnessed an exponential growth in the last few years (Liautand & Hammond, 2001). Wireless technology has also evolved from simple analog products designed for business use to emerging radioactive, signal-based wireless communications (Shafi, 2001). The tremendous potential of mobile computing and e-business has created a new concept of mobile e-business or e-business over wireless devices (m-business).

BACKGROUND

M-business can be defined as the use of mobile technology in exchange of goods, services, informa-

tion, and knowledge. M-commerce is the execution of transactions done on mobile equipment via mobile networks, which may be wireless or switched public networks. M-business includes the range of online business activities, business-to-business and business-to-consumer, for products and services through wireless devices such as mobile phones with display screens, personal digital assistance (PDA), two-way pagers, and low-end or reduced-size laptops.

Example applications are mobile ticketing and receipting, banking, gaming, e-mail communication, weather forecast, sport scores access, movie database access, stock exchange information, ordering of books, and other daily needs such as food and groceries. With new emerging mobile applications, users only receive selective and real-time information personalized to their interests (Ratsimor, Korablev, Joshi & Finin, 2001). For example by using a positioning system, the advertising information

DOI: 10.4018/978-1-60566-026-4.ch662

of local services and entertainment can be sent whenever a user is passing by a shopping mall. Another application is “inventory management” that tracks the location of goods, services, and people to determine delivery times. Multiple trucks carry large amounts of inventory that companies could access for just-in-time delivery (Varshney & Vetter, 2002).

Significant benefits of m-business to consumers are convenience, portability, safety, integrating existing mobile phones with mobile computing technology, verifiable receipts, and transaction records that can be made available instantly and permanently on a smartcard. Significant advantages of m-business to service providers and content providers include driving additional revenue and decreasing consumer attrition by offering new m-business services to specific groups of customers.

WIRELESS TECHNOLOGIES TO ENABLE M-BUSINESS

Many wireless technologies exist to enable m-business services (Tsalgatidou, Veijalainen, Markkula, Katasonov & Hadjiefthymiades, 2003). All technologies try to achieve benefits such as being powerful, simple, economical, and secure. Some examples of these techniques follow.

Wireless Application Protocol technology links wireless devices to the Internet by optimizing Internet information so it can be displayed on the small screen of a portable device.¹ Web pages accessed by WAP-enabled mobile portals during m-business transactions must be written in WML.² It is not sure how well WAP will be able to proliferate (Tsalgatidou et al., 2000). Developments such as third-generation (3G) mobile communications and XYPOINT Web WirelessNow applications (Wen, 2001) already allow mobile phone consumers to experience the Web services without WAP.

Wireless Internet connecting technologies that offer textual interface such as WAP significantly

suffer from the constraints of wireless communication such as having a small display screen. An alternative solution is providing voice access to users. Advances in speech recognition and text-to-speech technologies have made voice-based communication possible between computers and users over the phone.

*VoxML*³ technology, based on the W3C XML standard, enables the application interface to be in the form of dialogues. However, there is an extra overhead for content providers to offer the same Web service through different channels, for example, providing a voice-enabled browser for their wireless customers along with the HTML/XML/WML browser. Another overhead is the processing power that speech recognition requires. Also this type of data transfer mode is not appropriate for applications with confidential data where one could be overheard. Overall, the success of this technology depends on public acceptance of mobile phones as data-delivering tools and the type of applications best suited to their use.

The *Bluetooth* technology further enhances the sphere of mobility by conducting m-business without a heavy network infrastructure unlike WAP and VoxML technologies.⁴ The Bluetooth technology is designed to allow low-cost, short-range data (asynchronous) and voice (synchronous) radio link (2.4 GHz, 1 Mb/sec) to facilitate protected connections for stationary (homes, buildings, shopping centers, restaurants, cars, etc.) and mobile (phones, PDAs) computing environments. A simple example of a Bluetooth application is to automatically update mobile phone contents such as phone list, e-mails, and memos without any user involvement when the phone comes within the range of the home/office PC. Currently, the Bluetooth networks providing m-business services are limited to 10 meters only. Also, it has too many flaws in terms of security for the services to be trusted. A promising future of Bluetooth technology is its integration with WAP or VoxML.

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