

## Chapter XV

# Barcode Applications for M-Business

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### ABSTRACT

One pertinent area of recent m-commerce development is in methods for personal transaction and information transfer. Several companies around the world have begun to use barcodes for the provision of m-commerce services. This chapter provides background on the enabling technological platform for providing such services. It then continues with three cases where mobile barcodes have been used—in Japan, New Zealand, and the UK. Subsequently, these are used as the basis for a discussion and analysis of the key business models, and strategic implications for particular markets. The chapter concludes with predictions for the market and directions for future research.

### INTRODUCTION

With well over a billion mobile handsets worldwide, wireless technologies are enabling e-businesses to expand beyond the traditional limitations of the fixed-line personal computer (Bai, Chou, Yen, & Lin, 2005; Barnes, 2003; Barnes & Huff, 2003; Barnes & Vidgen, 2001; Bergeron, 2001; Chen, 2000; Clarke, 2001; de Haan, 2000; Emarketer, 2002; Kalakota & Robinson, 2002; Sadeh, 2002; Yuan & Zhang, 2003). According to a study by Telecom Trends International (2003), global revenues from m-commerce could grow from \$6.8 billion in 2003 to over \$554 billion in 2008.

As each mobile device is typically used by a sole individual, it provides a suitable platform

Figure 1. Technology convergence between OCR and mobile phones



for delivering individual-based target information, purchasing goods or services and making payments (Barnes, 2003; Barnes & Scornavacca, 2004; Bayne, 2002; Kannan, Chang, & Whinston, 2001; Newell & Lemon, 2001; Scornavacca & Barnes, 2003). One recent development in m-commerce is the application of barcodes solutions (NTT DoCoMo, 2003). This revolutionary development benefits from the convergence of two widespread technologies: optical character recognition (OCR) and mobile telephony (see Figure 1). Through barcodes, users of mobile phones can, for example, purchase tickets, receive coupons, access information, make payments, and interact with point-of-sale information systems (Airclic, 2003; AsiaTech, 2003; Bango, 2003; Barcode 1, 2003; Ecrio, 2003; NTT DoCoMo, 2003; Wireless Newfactor, 2002).

This chapter aims to explore the applications of barcodes in mobile commerce. The following section provides a brief explication of barcodes and OCR technologies. This is followed by three case studies of the application of barcodes in m-commerce: in Japan, New Zealand, and the

United Kingdom. Subsequently, we explore the business models being employed, and analyze the strategic implications of these models for different m-commerce markets. The chapter concludes with a discussion about the future of mobile commerce and directions for further research.

## TECHNOLOGICAL FOUNDATIONS: OPTICAL CHARACTER RECOGNITION AND BARCODES

OCR technology has been used in business for nearly half a century. OCR devices transform specially designed marks, characters, and codes into a digital format. The codes can contain any kind of information, such as alphanumeric codes, date, time, names, and so on. The most widely used application of optical code is the barcode, and this has become used in a vast range of organizations, including supermarkets and retail stores (point-of-sale [POS] systems), libraries, hospitals, schools, and factories (production and supply chain management) (Uniform Code Council, 2003).

There are several varieties and standards for barcodes. The symbol found on most retail products around the world is based on UPC/EAN standards (Figure 2a). The Universal Product Code (UPC), developed by the Uniform Code Council (UCC), was the first barcode symbol widely adopted in the world. In 1973, the grocery industry formally established UPC as the standard bar code symbology for product marking in the United States. European interest in UPC led to the adoption of the European Article Numbering (EAN) code format in 1976 (EAN, 2003). Today, EAN International is a global not-for-profit organization that creates, develops, and manages jointly with the UCC open, global, multisectoral information standards, and the EAN/UCC standards. All businesses must apply for membership in order to be assigned a unique company identification number for use on all its products (Uniform Code

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