

## Chapter 89

# Ubiquitous Computing, Contactless Points, and Distributed Stores

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### **ABSTRACT**

*The new technologies modify both customer behavior and corporate approach to the retail process by changing both the way consumers access and consumption of information. In this scenario, a huge number of “contactless technologies” are emerging as the most promising direction for supporting automatic payment and self-checkout. Similarly, ubiquitous retailing is acquiring importance in the current competitive scenario, based on ubiquitous computing (or ubiquitous access to information). As a consequence, these innovations are removing the boundaries of the physical space and pushing retailers to redefine the traditional business model and practices. The aim of this chapter is to provide a comprehensive framework of this new competitive scenario, starting from the most innovative technologies in retail domain with emphasis on the new ubiquitous ones, and sheds lights on the future of the (technology-enriched) places of shopping.*

### **INTRODUCTION**

Nowadays, retailing is subjected to constant changes due to the continuous advancements in technology (Pantano, 2014). In fact, the increasing computing capabilities, the mobile and wireless technologies improvements, as well as the development of flexible software architectures and automatic identification technologies support the ubiquitous access to data for both consumers and firms. As a consequence,

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these new systems modify the interface between clients and vendor, by providing new consumer-oriented services (Ngo and O’Cass, 2013; Pantano, 2014), as well as the customer behavior and corporate approach to retail process, by changing both the way customers access and consume the information, and the way firms and organizations reach clients and deliver the service (Kim, et al., 2009; Demirkan and Spohrer, 2014).

In this scenario, ubiquitous computing is supporting ubiquitous access to information for consumers and marketers, with emphasis on retail services (Pantano, 2013). It is based on the ubiquitous computing, which can be viewed as an extension of mobile computing characterized by portable accessing technologies (i.e. cameras, Location Based Service, Ubiquitous Sensor Network, etc.), always connected to a network, and linked to web-based multimedia content repositories that adapt the provided contents according to users’ data (i.e. location, preferences, etc.) (Lin, et al., 2011). Therefore, these innovations are removing the boundaries of the physical space (Kourouthanassis et al., 2007; Bourlakis et al., 2009; Demirkan and Spohrer, 2014; Pantano, 2013; Pantano, 2014), while pushing retailers to redefine the traditional business model and practices. Similarly, a huge number of “contactless technologies” is emerging as the most promising direction for supporting retailing and shopping experience, by providing new modalities for automatic payment and self-checkout (Lai and Chuah, 2010). These are based on proximity sensor that allows payment without entering any pin. For these reasons, the number of contactless transactions is speeding up fast the payment process, increasing the convenience of shopping experience and reducing the queues. In fact, many retailers are soliciting users to adopt this system, such as McDonalds that offers a free drink on any menu purchased via contactless. For instance, MasterCard reports that the 10% of transactions made in Australia under \$100 is performed via contactless technologies, while VISA Europe reports more than 1 million of contactless purchases in August 2013 (VISA Europe, 2013).

The aim of this chapter is to provide a comprehensive view of the new retail competitive scenario, starting from the most innovative technologies in retail domain. Subsequently, it sheds light on the possible consequences of these radical innovations in terms of store structure, and provides some indications for predicting the trends of the future (technology-enriched) shopping places.

## **BACKGROUND**

As anticipated, the continuous progresses in information and communication technologies (ICT) impact on retail strategy and operations triggering the proliferation of new channels and new modalities through which customers may directly interact with firms. Due to the large amount of technological innovations, the necessity to classify them emerges as the starting point for a deep understanding of the current scenario. In this chapter, we propose a classification based on the functions of these systems for retail purposes as follows: (i) technologies for virtually trying the products, (ii) technologies for automatic product search, (iii) technologies for automatic payments, and (iv) full-service technologies (technologies integrating all these services).

### **Technologies for Virtually Trying Products**

Current advances in 3D graphics and virtual reality tools offer novel and realistic interfaces that can be easily integrated in physical environments for enhancing the sensorial inputs and enriching consumers shopping experience (Bullinger et al., 2010). Augmented reality emerges from the integration of virtual

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