

# Chapter 17

## Building an Intelligent Mobile Advertising System

**Jerry Zeyu Gao**  
San Jose State University, USA

**Angela Ji**  
Acesso Software, USA

### ABSTRACT

*The fast deployment of wireless networks and mobile technologies and the significant increase in the number of mobile device users have created a very strong demand for new innovative mobile commerce applications and services. Since mobile advertising is one of the important subjects in mobile commerce, studying and developing mobile advertising solutions becomes a hot research and business topic. This paper first discusses the basic concepts of mobile advertising. Then, it reports a mobile advertising system (known as SmartMobile-AD), including its supporting business process, functions, system architecture, and built-in technical solutions. The system supports the wireless advertising workflow for wireless service companies and publishers (or portals) to manage and deliver multimedia mobile ads to mobile users over the wireless Internet. The paper provides insights and design solutions on mobile advertisement targeting, delivery, tracking, and performance measurement. Furthermore, the paper presents application examples of the system.*

### 1. INTRODUCTION

The fast deployment of wireless networks and mobile technologies and the significant increase in the number of mobile device users have created a very strong demand for emerging mobile commerce applications and services. Wireless advertising is one of the important and hot subjects in m-commerce

and wireless application. In recent years, there is a tremendous increase of the number of mobile users and their usage of wireless networks and wireless internet. According the November issue of *Wireless Design & Development Asia*, in 2007, wireless networks are deployed in 224 countries in the world. Informa Telecoms and Media reveals that worldwide mobile subscriptions will hit 3.3 billion—equivalent to 50% of the global. They also forecast that wireless advertising revenue

DOI: 10.4018/978-1-4666-0119-2.ch017

will grow in the next 5 years from \$871 million in 2006 to over \$11 billion annually by 2011. Hence, mobile devices have become the new frontier and hot targets for advertisers.

Recently, there are many papers addressing mobile commerce and wireless application systems. Although there are numerous published papers addressing mobile and wireless advertising, most of them focus on the basic concepts, needs and effectiveness, issues and challenges, business models, and user acceptances. In addition, there are published papers discussing different methods (or approaches) for mobile advertising. However, there is a lack of published papers discussing wireless advertising systems supporting wireless service vendors or mobile publishers (or portals) to assist their complete marketing and advertising workflow process, which enables mobile advertiser to manage, schedule, changing, deliver and post diverse mobile ads in different formats (such as texts, images, audios, and videos) to users on mobile devices.

This paper focuses on wireless advertising and provides a comprehensive study on mobile advertising. It first provides the basic concept and background on mobile advertising, including processes, issues and challenges, and major players. Then, it presents a wireless advertising system (SmartMobile-AD) in terms of its supporting functions, system architecture, and its built-in technical solutions. The system supports the wireless advertising workflow for mobile service vendors and publishers (or portals) to manage and deliver multimedia mobile ads to mobile users over the wireless Internet. Unlike the published research work, this paper presents the first published results discussing how to design and develop a mobile advertising system to support a complete workflow process for mobile publishers. The paper provides detailed insights on important technical solutions in mobile ad targeting, delivery, tracking, performance measurement, and payment.

This paper is structured as follows. Next section discusses basic concepts and background about mobile advertising in terms of diverse mobile ads, issues and challenges, different processes, and major players. Section 3 introduces SmartMobile-AD by presenting its system functions, built-in business process, system architecture, database design, used technologies. Section 4 presents the detailed technical solutions in SmartMobile-AD to support intelligent advertise targeting, multimedia delivery, tracking, payment, and performance measurement. Section 5 presents the application examples of SmartMobile-AD. Section 6 provides a comprehensive review on the existing research and related work. Finally, the conclusion remarks and future work are discussed in Section 7.

## **2. UNDERSTANDING MOBILE ADVERTISING**

### **2.1 Basic Concepts in Mobile Advertising**

What is wireless advertising? As defined in Gao, Shim, Mei, and Su (2006), wireless advertising is “a process which various advertising and marketing activities are performed using mobile advertising solution to deliver advertisements to mobile devices”. Wireless advertising not only offers a new advertising and marketing channel between advertisers and mobile users, but also has its unique advantages over online advertising. Its basic concepts and three distinct features have been highlighted in (Yunos, Gao, & Shim, 2003).

- **Mobile Accessible:** wireless ads can be accessed by mobile device users via wireless connection anywhere and at anytime.
- **Personal:** since wireless devices can carry mobile user’s assigned identity, it enables advertisers to deliver personalized advertisements based on the profiles of mobile device users.

23 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/building-intelligent-mobile-advertising-system/62977](http://www.igi-global.com/chapter/building-intelligent-mobile-advertising-system/62977)

## Related Content

---

### Enhanced Adaptive Call Admission Control Scheme With Bandwidth Reservation for LTE Networks

Maniru Malami Umar, Amimu Mohammed, Abubakar Roko, Ahmed Yusuf Tambuwaland Abdulhakeem Abdulazeez (2021). *International Journal of Mobile Computing and Multimedia Communications* (pp. 23-42).

[www.irma-international.org/article/enhanced-adaptive-call-admission-control-scheme-with-bandwidth-reservation-for-lte-networks/271386](http://www.irma-international.org/article/enhanced-adaptive-call-admission-control-scheme-with-bandwidth-reservation-for-lte-networks/271386)

### Getting Connected: At What Cost? Some Ethical Issues in Mobile HCI

Antti Pirhonen and Elizabeth Sillence (2009). *International Journal of Mobile Human Computer Interaction* (pp. 9-17).

[www.irma-international.org/article/getting-connected-cost-some-ethical/34073](http://www.irma-international.org/article/getting-connected-cost-some-ethical/34073)

### Adaptive Mobile Sink for Energy Efficient WSN Using Biogeography-Based Optimization

Ajay Kaushik, S. Indu and Daya Gupta (2019). *International Journal of Mobile Computing and Multimedia Communications* (pp. 1-22).

[www.irma-international.org/article/adaptive-mobile-sink-for-energy-efficient-wsn-using-biogeography-based-optimization/232685](http://www.irma-international.org/article/adaptive-mobile-sink-for-energy-efficient-wsn-using-biogeography-based-optimization/232685)

### Collaboration via Technology as a Means for Social and Cognitive Development within the K-12 Classroom

N. Leigh Boyd (2016). *Handbook of Research on Mobile Learning in Contemporary Classrooms* (pp. 181-203).

[www.irma-international.org/chapter/collaboration-via-technology-as-a-means-for-social-and-cognitive-development-within-the-k-12-classroom/157980](http://www.irma-international.org/chapter/collaboration-via-technology-as-a-means-for-social-and-cognitive-development-within-the-k-12-classroom/157980)

### A Technology Intervention Perspective of Mobile Marketing

Dennis Lee and Ralf Muhlberger (2009). *Mobile Computing: Concepts, Methodologies, Tools, and Applications* (pp. 279-288).

[www.irma-international.org/chapter/technology-intervention-perspective-mobile-marketing/26507](http://www.irma-international.org/chapter/technology-intervention-perspective-mobile-marketing/26507)