

## Chapter 6.6

# Opportunistic Networks as an Enabling Technology for Mobile Word-of-Mouth Advertising

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### ABSTRACT

*The growing share of people using mobile devices, that support wireless peer-to-peer interaction, offers the opportunity to build a ubiquitous infrastructure for electronic word-of-mouth messaging and advertising. This chapter introduces Opportunistic Networks as a layer for one-hop communication that opens up electronic word-of-mouth messaging for mobile devices. The reader will learn about adPASS (short for advertisement passing), a system build on top of Opportunistic Networks for digital advertisement distribution stimulated by an anonymous and tamper-resistant bonus point model. A simulation based on empirical movement patterns indicates the feasibility of our approach. This chapter concludes with a summary and provides an outlook on further research paths starting from our findings.*

### INTRODUCTION AND MOTIVATION

Mobile marketing as a ‘*form of marketing communication using mobile communication techniques to promote goods, services and ideas*’ (Pousttchi & Wiedemann, 2006) gains more and more attraction with the rapidly increasing number of

mobile phones (1.15 billion units were sold in 2007 according to Gartner<sup>1</sup>). In fact each new device generation is equipped with short range wireless communication capabilities. In most cases, either Bluetooth or 802.11 WiFi technology is integrated into the devices. Today’s prevalent use of wireless connectivity is to synchronize personal data between a mobile device and a desktop computer (using Bluetooth) or to have easy access to an

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institution's network (via 802.11 WiFi Wireless Access Points) and further to the Internet (for a general introduction into mobile marketing see Pousttchi & Wiedemann, 2006; Gewei, 2007).

However, with the integration of short range wireless communication technology into mobile devices, a new network type called *Opportunistic Network* (OppNet for short) is possible and especially suitable for a new form of digital *word-of-mouth (WOM) recommendation* or *viral marketing*.

Following Bone's (1995) characterisation, WOM communications are '*interpersonal communications in which none of the participants are marketing sources*'. The benefits of WOM recommendation for marketing campaigns have been widely recognized and investigated in the literature. See (Arndt, 1967; Herr, Kardes, & Kim, 1991; Bone, 1995) for research on *face-to-face* WOM or (Helm, 2000; DeBruyn & Lilien, 2004; Hennig-Thurau, Gwinner, Walsh, & Gremler, 2004; Datta, Chowdhury, & Chakraborty, 2005) for Internet-based WOM approaches. As already said, the increasing number of mobile devices now put a research focus on mobile word-of-mouth recommendation (cf. Wiedemann, Haunstetter, & Pousttchi, 2008), in the majority of cases considering cellular network services (SMS, MMS, etc.) for content distribution.

Our approach differs in the sense that we use a *mobile ad hoc peer-to-peer* communication scheme to facilitate the distribution of digital advertisements among interested users. As a starting point, let us first look at word-of-mouth recommendations in everyday live:

**Real-World Word-of-Mouth Recommendation:** Alice and Bob are co-workers sharing the same office. On her way to work, Alice passes a shop window that announces a digital camera 20% off the regular price. Alice knows that Bob plans to buy such a camera and tells him about the advertisement when she arrives at her office. During lunch break, Bob visits the shop and buys

the camera, glad that Alice has directed his attention to the offer.

Word-of-mouth recommendation is a well-known and established way of communication and interaction among humans (cf. Arndt, 1967; Herr, Kardes, & Kim, 1991; Bone, 1995). There are two assumptions here: Alice and Bob know each other's interests in certain aspects of life and they meet on a regular basis (or know how to contact each other) to share information. In addition, on her way to work, Alice needs to be wide awake in order to notice shop window announcements.

OppNets are able to mimic this form of recommendation and to extend it. The adPASS<sup>2</sup> prototype discussed in detail within this chapter makes use of an Opportunistic Network as a communication layer.

**Digital Word-of-Mouth Recommendation:** Alice carries a mobile device with her. A personal profile, stored on her device, holds information about her interests and knowledge. The device is able to match her profile with other nearby devices by communicating wirelessly and without user interaction.

A shop has put a fixed device next to the shop window announcing digital advertisements to passersby. As Alice passes the shop window, her device learns about the special offer for digital cameras.

Alice physically carries the advertisement with her and passes it further to other users she encounters. All users interested in the advertisement (including herself and her colleague Bob) might take the chance and visit the shop in order to buy the advertised product.

A digital word-of-mouth recommendation differs from its real-world equivalent in several ways: the users who exchange advertisements do not need to know each other personally. A match in their profiles is sufficient to share the information. Next, a user does not need to keep his attention on the device as that the device works autonomously without interaction. This non-intrusive device behaviour allows the exchange of advertisements

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