

# Chapter 13

## Mobile Location–Based Recommender: An Advertisement Case Study

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### ABSTRACT

*Mobile devices, including cell phones, capable of geo-positioning (or localization) are paving the way for new computer assisted systems called mobile location-based recommenders (MLBRs). MLBRs are systems that combine information on user's location with information about user's interests and requests to provide recommendations that are based on "location". MLBR applications are numerous and emerging. One MLBR application is in advertisement where stores announce their coupons and users try to find the coupons of their interests nearby their locations through their cell phones. This chapter discusses the concept and characteristics of MLBRs and presents the architecture and components of a MLBR for advertisement.*

### INTRODUCTION

With the exponential increase of cell phone users in the past several years, more specifically cell phones with location-aware capabilities, the parameter of "location" has become an integral component of mobile applications. (Bellotti, et al., 2008) conducted a survey and reported that mobile Internet is permeating into different location-based applications such as train schedule, weather report, and restaurant finding. Among

the available location-based applications on cell phones, maps are the most popular means of user interface (Meng & Relchendbacher, 2008). Current mobile phones, which support a higher bandwidth and localization (Baus, Cheverst, & Kray, 2005) are paving the way for the emergence of a new class of systems, which we call mobile location-based recommenders (MLBRs). MLBRs combine information on user's location with information about user's interests and requests to provide useful recommendations based on location via mobile devices. Many diverse applications can benefit from MLBRs; these include health (e.g.,

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recommending nearby hospitals), education (e.g., recommending nearby libraries), and e-commerce (e.g., recommending clothing stores with special offers). The goal of MLBRs is to recommend mobile users with information which is of their interest and needs using their current location. MLBRs are beneficial to individuals in that they save their time in exploring the needed location-based information by receiving automatic recommendations that meet their needs and preferences. For instance, for a user who is interested in the stores that have items of his/her interest on sale, an MLBR can recommend such stores while the user is driving and getting close to each.

In this chapter, we describe a MLBR for advertisement (mainly coupons search) and present a prototype for recommending coupons. The objectives of the paper are: (a) to understand the infrastructure and components of MLBRs, (b) to become familiar with the range of technologies appropriate for MLBRs, and (c) to understand important issues for designing and developing MLBRs. The structure of the paper is as follows.

The structure of the paper is as follows. In Section 2, related works are discussed. Section 3 overviews the MLBR concept and its relationship to recommender, navigation, and mobile services. Section 5 and 6 describes an application of MLBR in m-commerce and a scenario for MLBR-Coupon. In section 7 and 8 MLBR-Coupon architecture and components and a prototype MLBR-Coupon for advertisement are presented. Section 9 provides the conclusion and future research.

## **RELATED WORKS**

Among the various available MLBR applications, some are extensions of current mobile applications with the parameter of “location” as another way of injecting data into the decision process. (Yu & Chang, 2009) presented a personalized MLBR for tour planning. Sightseeing spots, hotels, restaurants, and other points of interest (POIs) to tour-

ists are recommended based on tourist’s location, time, and personal preferences and needs. (Yang & Wang, 2009) developed an architecture using WEB2.0 services for restaurant recommender. In this research restaurants are recommended to users based on their location that is obtained via Global Positioning System (GPS). (Hinze & Buchanan, 2006) presented a MLBR for tourists called Trip Information Provider (TIP). TIP provides a user with general information based on their location, personal profile, and their travel history once they have entered a museum. Moreover, users are informed of scheduled events such as opening hours of a museum. (Rashid, Coulton, & Edwards, 2008) presented a system which provides location-based information/advertisement for mobile users. By implementing the system in a supermarket, nearby customers are provided with the latest information on products as well as special offers, using Bluetooth. SMMART (Kurkovsky & Harihar, 2005) is another context-aware system which provides users with recommendations or promotions in a given retail store, considering user’s preferences. (Bellotti, et al., 2008) presented Magitti, a leisure guide, which automatically recommends its user a leisure activity. It predicts user’s future activity based on context and their patterns of behavior, and then recommends a useful activity considering user’s preferences. (Park, Hong, & Cho, 2007) developed a map-based personalized recommendation system, which collects context information, location, time, weather upon a mobile user request, and provides the user with a proper service on a map. The POI recommender presented by (Horozov, Narasimhan, & Vasudevan, 2006) is another mobile recommender which provides its users with recommendations on POIs (e.g., restaurant) considering their location and preferences.

In this chapter, we present the architecture of MLBR-Coupon and discuss a prototype MLBR-Coupon where stores coupon promotions are recommended to users. MLBR-Coupon facilitates accessing to stores with coupons on products/

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