

## Chapter 2.35

# Content Personalization for Mobile Interfaces

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### INTRODUCTION

The contribution of context information to content management is of great importance. The increase of storage capacity in mobile devices gives users the possibility to maintain large amounts of content to their phones. As a result, this amount of content is increasing at a high rate. Users are able to store a huge variety of content such as contacts, text messages, ring tones, logos, calendar events, and textual notes. Furthermore, the development of novel applications has created new types of content, which include images, videos, MMS (multi-media messaging), e-mail, music, play lists, audio clips, bookmarks, news and weather, chat, niche information services, travel and entertainment information,

driving instructions, banking, and shopping (Schilit & Theimer, 1994; Schilit, Adams, & Want, 1994; Brown, 1996; Brown, Bovey, & Chen, 1997).

The fact that users should be able to store the content on their mobile phone and find the content they need without much effort results in the requirement of managing the content by organizing and annotating it. The purpose of information management is to aid users by offering a safe and easy way of retrieving the relevant content automatically, to minimize their effort and maximize their benefit (Sorvari et al., 2004).

The increasing amount of stored content in mobile devices and the limitations of physical mobile phone user interfaces introduce a usability challenge in content management. The physical mobile

phone user interface will not change considerably. The physical display sizes will not increase since in the mobile devices the display already covers a large part of the surface area. Text input speed will not change much, as keyboard-based text input methods have been the most efficient way to reduce slowness. While information is necessary for many applications, the human brain is limited in terms of how much information it can process at one time. The problem of information management is more complex in mobile environments (Campbell & Tarasewich, 2004).

One way to reduce information overload and enhance content management is through the use of *context metadata*. Context metadata is information that describes the context in which a content item was created or received and can be used to aid users in searching, retrieving, and organizing the relevant content automatically. Context is any information that can be used to characterize the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and the applications themselves (Dey, 2001). Some types of context are the *physical context*, such as time, location, and date; the *social context*, such as social group, friends, work, and home; and the *mental context*, which includes users' activities and feelings (Ryan, Pascoe, & Morse, 1997; Dey, Abowd, & Wood, 1998; Lucas, 2001).

By organizing and annotating the content, we develop a new way of managing it, while content management features are created to face efficiently the usability challenge. Context metadata helps the user find the content he needs by enabling single and multi-criteria searches (e.g., find photos taken in Paris last year), example-based searches (e.g., find all the video clips recorded in the same location as the selected video clip), and automatic content organization for efficient browsing (e.g., location-based content view, where the content is arranged hierarchically based on the content

capture location and information about the hierarchical relationships of different locations).

### DATE, TIME, LOCATION, AND PROXIMITY

While context can be characterized by a large number of different types of attributes, the contribution of context attributes to content management is of great importance. We focus on a small number of attributes, which are considered the most important in supporting content management and also have the most practical implementations in real products, such as date, time, location, and proximity (nearby Bluetooth devices). Bluetooth is a short-range wireless technology used to create personal area networks among user mobile devices and with other nearby devices.

The first two attributes, date and time, are the most common in use in a wide range of applications. They are used to organize both digital and analog content, and offer an easy way of searching and retrieving the relevant content automatically. For example, many cameras automatically add the date and time to photographs. Furthermore, the location where content is created is another useful attribute for searching the content (e.g., home, workplace, summer cottage). Mobile devices give users the possibility to create content in many different locations. Users can associate the location with the equivalent content in order to add an attribute to it that will enable them to find it easier. Finally, proximity also plays an important role in content management, as nearby Bluetooth devices can provide information both in social and physical context. While each Bluetooth device can be uniquely identified, information can be provided on nearby people by identifying their mobile phones. An example for physical context is the case of a Bluetooth-based hands-free car kit that can be used to identify that the user is in a car.

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