Chapter XVI
Modular Implementation of an Ontology–Driven Multimedia Content Delivery Application for Mobile Networks

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ABSTRACT

Today, mobile multimedia applications provide customers with only limited means to define what information they wish to receive. However, customers would prefer to receive content that reflects specific personal interests. In this chapter we present a prototype multimedia application that demonstrates personalised content delivery using the multimedia messaging service (MMS) protocol. The development of the application was based on the multimedia middleware framework METIS, which can be easily tailored to specific application needs. The principle application logic was constructed through three indepdent modules, or "plug-ins" that make use of METIS and its underlying event system: the harverster module, which automatically collects multimedia content from configured RSS feeds, the news module, which builds custom content based on user preferences, and the MMS module, which is reponsible for broadcasting the resulting multimedia messages. Our experience with the implementation demonstrated the rapid and modular development made possible by such a flexible middleware framework.

INTRODUCTION

Multimedia messaging service (MMS) has not achieved a similar market acceptance and customer adoption rate as *short message service* (SMS), but is nevertheless one of the primary drivers of new income streams for telecommunication companies and is, in the long run, on the way to becoming a true mass market (Rao & Minakakis, 2003). It provides new opportunities for customised content services and represents a significant advance for innovative mobile applications (Malladi & Agrawal, 2002).

Until now, however, mobile operators have failed to deliver meaningful focused mobile services to their users and customers. Telecommunication companies have made considerable investments (license, implementation costs) into third generation (3G) mobile networks but have not yet generated compensating revenue streams (Vlachos & Vrechopoulos, 2004). Customers are often tired of receiving information from which they get no added value, because the information does not reflect their personal interests and circumstances (Sarker & Wells, 2003). The goal is instead to establish a one-to-one relationship with the user and provide costumers with relevant information only. Through personalisation, the number of messages the customer receives will decrease significantly, thus reducing the number of irrelevant and unwanted messages (Ho & Kwok, 2003).

Currently available MMS subscription services (e.g., Vodafone, 2005) allow customers to define what kind of information they want to receive in a very limited way. Broad categories like *Sports*, *Business*, or *Headline News* can be defined, but there is no generic mechanism for the selection of more specific concepts within a given domain of interest. The

personalised and context-aware services demanded by savvy customers require a mediation layer between the users and content that is capable of modelling complex semantic annotations and relationships, as well as traditional and strongly-typed metadata. These will be defining characteristics of next-generation multimedia middleware.

This paper describes the modular development of a mobile news application, based on a custom multimedia middleware framework. The application supports ontology-driven semantic classification of multimedia content gathered using a widespread news markup language. It allows users to subscribe to content within a particular domain of interest and filters information according to the user's preferences. Moreover it delivers the content via MMS. The example domain of interest is the Soccer World Cup 2006 for which a prototypical ontology for personal news feeds has been developed. However, the middleware framework enables mobile multimedia delivery that is completely independent from the underlying domain-specific ontology.

BACKGROUND AND RELATED WORK

Related Work

At this time, there are no readily available systems that combine the power of ontology-based classification, published syndicated content, and a personalised MMS delivery mechanism. There are however a number of proposals and applications that make use of principles and procedures that are similar to those presented in this chapter.

Closely related to the classification aspect of the presented MMS news application are

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