Efficient Information Access from Constraint Wireless Terminals

Exploiting Personalization and Location-Based Services

Hans Weghorn

Faculty for Information Technology, BA-University of Cooperative Education,
Rotebühlplatz 41, Stuttgart, Germany
weghorn@ba-stuttgart.de

Abstract. Today, the success of data services used from small mobile devices, like digital phones or PDAs, appears very limited. Different reasons can be identified, which prevent the average customer from broadly using wireless data services. At first, the user has to deal with very uncomfortable devices in terms of UI ergonomy, and on the other hand, the costs for wireless data communication are extremely high. These restrictions can be overcome by employing a system concept, which is built up on two main components: A personalized display software allows simplifying the information access on the wireless terminal, while an intermediate agent residing on the Internet takes care of mining the desired contents from the open Web. In addition to the improved UI handling, this concept offers a reduction of access costs and an increase in retrieval speed. Real-world experiments with an information system on actual train departures are reported for measuring and demonstrating the benefit of the described system concept.

Keywords: Personalization, Wireless Internet, Wireless JAVA, Location-based Services, Information Management.

1 Introduction

Up to now, a common use of data services accessed from mobile terminals could not establish very well. Due to their broad market distribution, digital mobile phones for cellular networks would yield a very interesting platform for data services, e.g. information retrieval on traffic situation on lanes and public transportation. Unfortunately, the user of these devices today faces a couple of constraints, which prevent a wide acceptance of such wirelessly accessed data services.

Considering first the handling of mobile devices, it has to be stated that software tools are usually very uncomfortable. Most tools do not sufficiently respect the constraints of small mobile devices (Johnson, 1998), because the user often has to enter information, e.g. lengthy Web paths, account information, or selection information. The costs for the wireless transfer of data contents represent another critical aspect. For instance in Germany, a comparison of the tariffs of land line networks (e.g. ADSL technology) and cellular phone networks shows that transferring data amounts wirelessly is roughly $10^4$ times more expensive.
Furthermore, the wireless data rates are slower in the order of $10^2 - 10^3$. WLAN (Riezenmann, 2002) seems to be an alternative wireless access technology, which can overcome these back draws. Unfortunately, it is not truly feasible for a seamless information retrieval, because it does not supply roaming and requires more complicate hardware. E.g., a laptop computer linked to a WLAN hot spot is good for reading e-mails in a restaurant or at an airport terminal, but it cannot conveniently be used for accessing current departure information on, e.g., trains or planes while walking or traveling to the station or airport.

A system concept, which was developed and reported during the recent years (Weghorn, 2003; Weghorn, 2004-1), is presumed to overcome these restrictions. The concept bases on two components (Fig. 1): One part is personalized display software for the wireless terminal, which minimizes the required inputs from the user and which optimizes the presentation of the results. And the other part is a data-mining agent running on a central server on the Internet, which appropriately collects, examines and prepares the desired information content for a transfer to the wireless display terminal, as soon as the user remotely commands this. Since this system collects customer specific contents on base of customized tools, the name C2C was defined for this mechanism.

Fig. 1. Construction concept of the customized information service

The user interacts with the C2C information retrieval system through the wireless terminal (Fig. 1). During this, the terminal executes specialized display software, which directs information queries to a central service agent residing on the Internet. The display software has to be constructed in the following manner:

- The required user input actions have to be minimized.
- The results have to be output in a reasonable presentation.
- Preferences of the user (e.g. passwords, account information) have to be remembered automatically, or should be editable by the user.
- The terminal software retrieves the desired information from the Internet agent by its activation with the appropriate settings and user preferences.