MyCampus: A Semantic Web Environment for Context-Aware Mobile Services

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With tens of millions of Internet-enabled mobile devices, the mobile Internet is opening the door a slew of new mobile applications and services that will assist users as they engage in time-critical, goal-driven tasks. Yet today, the mobile commerce landscape is dominated by relatively simple infotainment services. Moving beyond these simple services and taking full advantage of the opportunities offered by the mobile Internet requires overcoming the inherent input/output limitations of mobile devices through higher degrees of automation and the development of services that understand the *context* within which their users operate - e.g. their locations, the activities they are engaged in, who their friends and colleagues are as well as a number of other contextual attributes and preferences.
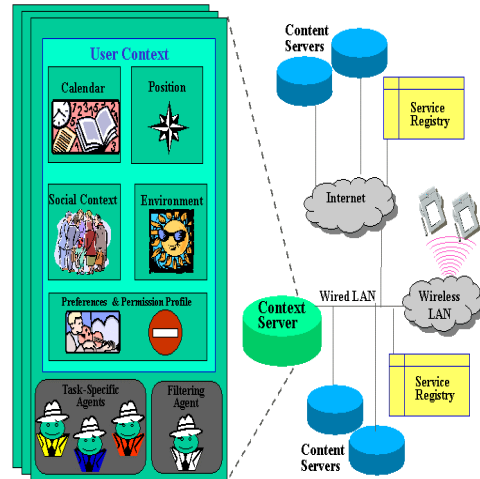
MyCampus is a semantic web environment for context-aware services, which we are in the process of developing and validating on Carnegie Mellon University's campus. The environment revolves around a growing collection of customizable agents capable of automatically discovering and accessing Intranet and Internet services as they assist their users in carrying out different tasks (e.g. planning an evening, organizing a study group, looking for a place where to eat, filtering incoming messages). The power and scalability of the environment directly derives from a set of **ontologies for describing contextual attributes, user preferences and web services**, making it possible to easily accommodate new task-specific agents and new Web services.

Like many other campuses, CMU's can be viewed as an everyday life microcosm. Members of the community engage in a broad range of activities from working and studying to socializing, practicing sports, attending a variety of events, shopping, eating, etc. MyCampus users access personalized, context-aware agents from their PDAs over the campus's wireless LAN. Specifically each user has a personal environment (aka an e-wallet) that controls access to his or her personal preferences and contextual attributes. Current contextual attributes include the user's location on campus, his calendar, friends and classmates, as well as information about the weather. Individual copies of task-specific agents are pulled by users into their personal environments, where they are instantiated, taking into account relevant user preferences and contextual attributes..

Fig. 1 Overview of MyCampus Architecture

An example of a simple agent implemented at the time of writing is a "restaurant concierge" that gives users suggestions where to have lunch, depending on their food preferences, the time they have available before their next meeting or class, their location on campus and the weather. For instance, when it rains, the concierge will look for places that do not require walking outside and, if the student only has 20 minutes before her next class, it will limit its recommendations to nearby fast food places.

References

N. Sadeh, "Mobile Commerce: New Technologies, Services and Business Models", Wiley, April 2002.