Development of an InfoStation-based multi-agent system for the delivery of context-aware mLearning services

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The incorporation of mobile technology into academic spheres with a view to “anywhere/anytime/anyhow” m-learning opportunities has grown exponentially in libraries and campuses worldwide. While the adoption of technologies such as SMS/MMS, podcasting etc. into the realms of education and learning is tremendously exciting, their integration so as to facilitate “learning on the move” within the classroom/library/information environments has not as yet achieved its transformational ideal. This project seeks to develop an InfoStation-based multi-agent architecture to facilitate the provision of mobile eLearning (mLearning) services across a University Campus area.

Basis for Research:
The InfoStations paradigm is an infrastructural system concept providing “many-time, many-where” access to wireless data services supporting the mobile eLearning (mLearning) process. This concept enables various classes of mobile devices to communicate both with each other and with a number of servers through geographically intermittent high-speed connections. Intelligent agents operating in the mobile user’s domain (Personal Assistants-PAs) and the InfoStations cooperate to facilitate a personalized and contextualized learning environment for system users. System functionality is presented as a set of adaptable mobile services. Semantic web technologies, such as the Ontology Web Language (OWL-S) protocol, enable the intelligent agents to seek out, discover and invoke the mLearning services. To facilitate the personalization of these mLearning services, the Composite Capabilities/Preference Profile (CC/PP) and User Agent Profile (UAProf) vocabularies are extended enabling the PA convey capability and preference information (CPI) about both the user and the access device. This ensures the presented services are customized and adapted to suit the user and operating context (device capabilities, wireless network constraints etc), facilitating an optimal learning environment for the assimilation of presented content.

Main Aims:
Establish communication infrastructure consisting of intelligent communication gateways to:
• Integrate high-performance wireless InfoStations communication with advanced solutions for improved student/educator access to mLearning services.

• Develop and demonstrate pilot mobile eLearning applications that take advantages of the advanced wireless InfoStations system providing a localised, contextualised and personalised mLearning environment:
  - mLecture: Allows students access to lecture material through their mobile devices (lecture content adapted and customized according to the CPI; various media involved in the delivery process, e.g. podcasting, video).
  - mTest: Provides a means of evaluating the students’ acquired knowledge and provides valuable feedback to students concerning their progress. mTest also allows the educator to shape the learning experience of the students, ensuring the optimal learning path is followed.
  - mLibrary-based services: Brings pre-existing library services into the mobile domain, allowing library users a greater level of freedom and access. Users can access a mobile catalogue of library resources, an interactive map service to locate resources and an automated recommendations system.

Funding Body: This research is being funded through the Irish Research Council for Science, Engineering and Technology (IRCSET).