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Introduction to the special issue on service provisioning in the Web and Mobile environments

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Recent technological developments leverage the Web and mobile technologies in order to offer exciting services to users ranging from online shopping and banking through to route navigation to social and entertainment services. With tens of millions of Web and mobile phone users there is an explosive growth in the usage of these services. The theme of this special issue is to investigate into the service provisioning in the Web and Mobile environments. It includes a selection of papers from an open call as well as papers from the authors of the 5th International Symposium on Web and Mobile Information Services, which was held in 26–29 May 2009, Bradford, UK. All the papers were subjected to two rounds of rigorous review process. Based on the reviews a total of nine papers were selected for publication. These papers present an interesting work on the context-awareness, ontologies, information searching and Web services composition in the Web and Mobile environments.

Fortier *et al*. present a framework for the development of web-based mobile context-aware applications. It provides desktop like widgets in order to facilitate the development of mobile Web applications in a much similar way as that of developing native mobile applications. A mobile hypermedia system is developed in order to demonstrate the applicability of the proposed framework in creating mobile Web and context-aware applications.

How to evaluate the quality of context (QoC) in pervasive environments is the work presented by Manzoor *et al*. The contribution develops a model that takes into account both objective and subjective views of the QoC such as reliability, timeliness, completeness and so on. The QoC model is simulated as a case study of rescue workers who are involved in rescuing people from a flood in a city. The workers collect context information about a flood and send it to the flood control room. Using the QoC model, the control room can efficiently analyse changes in the flood and plan the rescue strategy more effectively.

Algebra of contextualized ontologies is used by Cafezeiro *et al*. in order to specify context-aware systems at three-level of abstraction. The aim is to separate the application logic from the informational infrastructure in order to ensure a high degree of reuse and to simplify program development in context-aware systems. The proposed approach is exemplified through a case study of a ubiquitous computing application.

Improving the accuracy and precision of information search is a critical research issue in the Web and Mobile environments. The work presented by Arechiga *et al*. exploits ontologies in order to address this issue. The authors present an exhaustive survey of the potential concepts of an ontology of mobile context dedicated to the Web search. They then describe the initial process of creating an ontology that models the Mobile environment in order to increase the accuracy and precision of the search results.

Schrimpsher and Etzkorn propose two measurement models comprising and combining different metrics for ontologies: mean average recall estimates the quality of the returned data on a

query; mean average performance compares the performance difference in processing speed between reduced and complete ontology. A linear regression is created for both models that predicts informational quality and performance of reduced ontologies.

Zhao *et al.* formulate the rationale and presents a mechanism for conducting route searches under time constraints. Time constraints are identified as total time for a route and time bounds for visiting specific nodes. The approach is certainly of huge interest, particularly with regards to fairly recent popularization of location-based information systems and a more pervasive usage of computing.

In the same direction, Tsai and Kwee describe the design and development of information services for novelty mining, which allow users to access the novel yet relevant information of a given topic. The approach aims at reducing the information overload when interacting with either Web services or mobile information services. The authors detail the challenging issue of decomposing the complex novelty mining application into smaller, more manageable modules, which are later implemented as services on the Web as well as mobile devices.

Celik and Elci present a semantic business process composition agent (SCA) based on inference techniques. They describe each component of the SCA in detail. In this process, Armstrong's Axioms are used for semantic-based planning and inference of Web services.

Maamar *et al.* expand on previously defined capacity-driven Web services, now focusing on the engineering of such services. This interesting topic appears to extend the notion of autonomic computing in order to include the ability of a service to adapt to environmental circumstances. This approach also maintains the autonomy of a service—wherein a service is allowed to accept or reject requests from a user or from a composition process.

This special issue gives particularly relevant insights into the production of services in the Web and Mobile environments. A first insight concerns mainly ontologies and the role of context in service provisioning. An example case study is Web search. Management of such ontologies and context requires the design and development of specific tools for measuring the quality of returned data and the speed of the answer. It also requires the definition of 'algebra' on ontologies and also the analysis of QoC for some critical applications. A second insight concerns services. In Web and Mobile environments, there is a clear need for services for managing information. Two papers deal with this important topic. A last insight concerns the development of systems adapted to the particularity of Web and Mobile environments. This is considered through the application of known tools as well as the creation of customized tools able to cope with the new challenges introduced by Web and Mobile environments.