
Editorial

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Biographical notes: Lorna Uden is Professor Emeritus of IT Systems in the Faculty of Computing, Engineering and Technology at Staffordshire University. Her research interests include technology learning, HCI, mobile learning, activity theory, knowledge management, web engineering, multimedia, e-business, service science and innovation, semantic web, software as a service (SaaS) and problem-based learning.

Welcome to V7N2 of this journal. There are four papers in this issue ranging from data management to power graph analysis. The first paper is, 'Semantic mediation between ontologies', by Tamer Hossam, Mohamed Zaki and Khaled Badran. The authors of this paper describe the design and implementation of a mediator, to handle interoperability between two different ontologies. Different types of transformation services are presented and several transformation operations are explained in order to enable the mapping process. A new tool is proposed which has a facility to build ontologies with the ability for creating mediators. The proposed mediator can exploit many types of transformation services. The advantages of this mediator over the previous ones are explained and its implementation is investigated. According to these authors, in order to achieve interoperability between applications, data need to be exchanged. These data need to be interpreted by the receiver in the way it was intended by the sender. The key element for addressing the interoperability problem is building mediators. This paper introduces a new mediator that exploits several special purpose functions, to achieve conversion of string, currency, type, date and math operations. It presents a semantic based mediator between ontologies. The tool consists of system interface, ontology builder, ontology mapping, mapping tester and instances transformation to achieve complex instance transformations successfully. These authors claim that using this tool many web data will be shared between various sites. It will facilitate interoperability between heterogeneous sites that describe the same domain. However, further evaluation of the tool is needed to validate the results.

The second paper is, 'Mobility-supporting data management for location-based mobile systems: the special case of single category location repositories' by James E. Wyse. In this paper, Wyse argues that location-based mobile applications frequently require timely generation of user centric proximities from application-relevant repositories of business locations. The proximity generation requirement is poorly served by conventional data management query resolution approaches which are prone to result in response time degradation as repositories experience growth. This paper reports research on a location-aware method (LAM) of managing data specifically devised to

resolve queries for rapid proximity generation. Three operational concerns (performance, scalability, and manageability) provide a basis on which a specific form of LAM, linkcell-based LAM, is examined. Previous evaluative work on linkcell-based LAM focused on multiple category repositories (MCRs) in which business locations are explicitly classified using a predefined set of business categories. The research reported here is focused on single category repositories (SCRs), an important special case in which no predefined set of business categories is used. Results show how a reformulated location-aware method may be used to manage SCRs and suggest the means by which scalability is achieved and proximity generation performance is optimised.

The third paper is ‘A performance evaluation of a new bitmap-based XML processing approach over RDBMS’, by Mohammed Al-Badawi, Haider Ali Ramadhan, Siobhan North and Barry Eaglestone. This paper presents a comprehensive performance analysis of parent/ancestor-child/descendant (PACD) a novel bitmap-based XML processing approach. It aims to overcome several performance limitations that are well known in existing XML database technology.

The study evaluated three performance aspects of XML database techniques including query processing, XML updates and scalability. Each of these aspects has been tested using various measures and compared with some representative alternative approaches. Despite its narrow domain for the order-access queries and its high cost in terms of the number IO-Read operations, PACD almost always performed well in terms of query processing, resource consumption during XML updates and has shown acceptable scalability over a variety of XML database categories. The performance of PACD was compared against two representative techniques from the XML/RDBMS mapping technology and it covered several XML database aspects including the complexity of XML/RDBMS mapping process, query processing, updatability and the scalability of the system. The outcome of this research has shown that PACD is a promising alternative approach for processing XML data and therefore, further work in this direction is worth pursuing.

The last paper is ‘Designing a graphical interface for creativity support tools for designers: a case study’ by Jieun Kim, Carole Bouchard, Jean-François Omhover and Améziane Aoussat. This study proposes a co-designing, iterative methodology to design a graphical user interface for creativity support tools for designers. An iterative design and evaluation process was used to create the icon-based interface, during which the needs of the designers and the functionalities of the system were integrated until a complete operational prototype emerged. This process provided three sequential prototypes. The proposed methodology was designed and validated through carrying out a case study: the TRENDS system. This system is a content-based information retrieval system to improve designers access to inspirational resources – visual materials. The TRENDS system aimed to engage end-user participation, and it was important that the graphic elements of the interface encouraged creativity through innovative, engaging, and user-friendly features. Evaluation through longitudinal case study, by the authors found that their iterative design and evaluation process was a very efficient means of incorporating end users’ spontaneous feedback about icon redesigns in the early phases of development. It enabled the end users to ensure that key features of the creativity support tool were both usable and appealing. Future work is needed to continue to assess the operational prototype with expert designers (from different design sectors) to ensure the utility of the functionalities and the quality of the interface.