Editorial

Lorna Uden

FCET,
Staffordshire University,
The Octagon, Beaconside,
Stafford, ST18 0AD, UK
E-mail: L.uden@staffs.ac.uk

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, big data, 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 V8 N4 of this journal. This issue consists of five papers. The first paper is 'SP4PS: service process rewriting for efficient and proper web services composition' by M. Mansour Mekour and Sidi Mohamed Benslimane. According to these authors, web service has been identified as the basic technical building block for the next generation of web-based business solutions, which is featured with application, platform, and provider independence. Web service composition is a distributed model to construct new web services on top of existing primitive or other composite web services. It is a an emerging methodology for building unlimited value-added applications by aggregating existing limited sets of service components together according to dynamic business requirements, which has the potential to reduce development time and effort for new applications. The authors of this paper propose a flexible behavioural matchmaking, selection, integration and interleaving to enhance the dynamic web services composition at run-time. It assumes that both provided services and required ones are described by complex behaviours, which ensure the fulfilment of provider's constraints and user's requirements.

To evaluate the performance of the proposed approach, they have implemented a tool called SP4PS for a dynamic service composition. The authors argue that experimental results show that their approach correctly extracts the different alternative scenarios that are provided by services, and properly selects and dynamically combines primitive and composite web services. However, to validate its effectiveness, further empirical studies are needed.

The second paper is by Hao Gui and Mark Roantree, entitled 'Topological XML data cube construction'. Gui and Roantree argue that XML is the de facto standard for information interchange, its usage is now widespread. While there is a long established method for online analytical processing (OLAP) for relational data, similar efforts for XML data are not as well advanced. This is due to the fact that XML data does not conform to the tabular structure of relational data and instead uses a tree structure to represent data. As a result, some of the OLAP operations require a redesign. The use of OLAP is now widespread, having emerged primarily in areas of business information

systems using relational databases. However, the XML tree-based model is quite different from the relational model in mainstream OLAP. In terms of conceptual modelling, this provides new challenges, for example with operations such as cube and roll-up.

In this paper, the authors analyse the distinct characteristics and requirements of a more structured OLAP to make comprehensive comparisons between structural and flat dimensions. In order to build their conceptual model, they examined different XML cube construction models for commonly used XML recursive structures. This construction process requires only a single scan of input data and captures structural information, delivering both standard and structural OLAP support simultaneously. The authors have developed a new topological cube methodology by adopting a model-based approach whereby they utilise the underlying tree structure to deliver topological cube and roll-up functions for XML data.

According to the authors, one of the significant benefits of this approach is the integration of both structural and flat dimensions, which support both standard OLAP and topological OLAP using the same instance data.

To evaluate their approach, they developed a series of experiments to test both LeafPattern and TreePattern structures and examined parent-child and level-based structures. These experiments showed favourable performance times and efficiency in terms of times required for cube construction. It is important that the model should be tested and used in real life.

The third paper is 'W-entropy method to measure the influence of the members from social networks' by Li Weigang, Zheng Jianya and Guiqiu Liu.

With the rapid advance of the social media, the challenge is to develop new techniques and standards to measure the influence of people or brands in the online social networks. Each website has its way of ranking the display of the most influential members of its virtual society. According to these authors, most of the current measurement methods are incomplete and one-dimensional. The authors argue that calculating an individual's online influence is becoming more important as people seek advice from their peers on the internet regarding what they should think, buy and say.

In this paper, they presents a new measurement model, W-entropy, which has been developed, based on information theory, to study the influence of individuals based on different social networks. The authors argue that W-entropy is an effective approach that can be used to measure the ranking of influence by members of a social network. This paper compares the use of Famecount as a method to measure the ranking of index with W-entropy. The model was tested using data from Facebook, Twitter, YouTube, and Google search.

To evaluate the effectiveness, the developed method, was compared with Famecount ranking using the same data with different weight distributions. The result shows that W-entropy's method is suitable for index ranking to reflect uneven information distribution across various social networks. However, further empirical studies are needed to verify the effectiveness of this approach. There are many research issues that still need to be studied for using of index for measuring the influence of a member in a social medium. Questions such as, 'Which medium is good for use in advertisements such as products and services?' 'Because these social media are all different, what are the benefits of the use of Facebook or Twitter to promote influence among the members?' Another issue is how to handle the repetitive information from the internet.

The fourth paper is 'Repairing broken RDF links in the web of data' by Mohammad Pourzaferani and Mohammad Ali Nematbakhsh. According to these authors, linked data change over time. These changes include updating on features and address of entities. The address change in resource description framework (RDF) entities causes their corresponding links to be broken. Broken links are one of the major obstacles that the web of data is facing. Pourzaferani and Nematbakhsh argue that most approaches to solve this problem are to fix the broken links at the destination point. These approaches have two major problems: a single point of failure; and reliance on the destination data source.

In this paper the authors introduce a method for fixing broken links based on the source point of link to discover the new address of the detached entity. To achieve this, they introduce two datasets known as 'superior' and 'inferior'. Through these datasets, they create an exclusive graph structure for each entity that needs to be observed over time. This graph is used to identify and discover the new address of the detached entity. From this, the most similar entity, which is candidate for the detached entity, is deduced and suggested by the algorithm.

The proposed model was evaluated with DBpedia dataset within the domain of 'person' entities. The result shows that most of the broken links, which had referred to a 'person' entity in DBpedia, had been fixed correctly. To verify the model, other datasets from different domains must be tried.

The fifth paper is 'The aggregation of heterogeneous metadata in web-based cultural heritage collections: a case study' by Silvio Peroni, Francesca Tomasi and Fabio Vitali. These authors argue that proliferation of standards for metadata on the WWW has affected the problem of aggregating descriptive information in distributed web-accessible platforms. All aggregative data infrastructures in cultural heritage face the problem of defining a conversion model that limits the loss of information. Many techniques have been developed in order to achieve metadata interoperability and some applications have been proposed, for the realisation of Aggregative Digital Library Systems. However, the main issue is on the different metadata models in use related to cultural heritage: "metadata mapping is the appropriate technique in integration scenarios where an agreement on a certain metadata standard is not possible".

The authors argue that the main aim of this paper for them is to answer questions such as, 'How can they improve user queries in aggregators of cultural heritage collections?' 'How do they work in the direction of an effective enrichment of the exposed metadata, in order to address the information needs of end users?' Their aim is to enhance the formal representation of cultural heritage materials, reasoning about some key concepts to improve the quality of the description of digital resources by refining the conceptual model. The relation between original object and the medium used for its digital representation, the stratification of levels in the description of the object, and the separation between the description of the involved individuals and their roles, are concepts that they have used in order to propose a new approach to the description of resources. The authors believe that correctly approaching these three issues would help in a systemic refinement of the data model of the relevant ontologies, improving the usefulness of the information made available by the aggregation framework.

In order to discuss these issues and to proceed towards a redefinition of a data model for cultural heritage, they focus particularly on Europeana, the principal European Digital Library, as the foremost and most paradigmatic example of aggregators, and on the Europeana data model (EDM) as the conceptual model on which metadata from different

repositories are mapped in Europeana. The main aim of the project Europeana is to collect metadata from a large number of providers, mainly cultural institutions, across Europe, and to enable search and discovery of cultural items described therein. Further research is needed to validate the model.