

Special Issue on Web Technologies

Guest Editorial

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Nowadays, telecommunication technologies combined with Web-enabled technologies have transformed the Web into "*a collaborative medium, a place where we [could] all meet and read and write*" as reported by Tim Berners-Lee, the World Wide Web inventor. This new vision has created new opportunities but also raises many challenges and problems concerning collaboration, information sharing, social-based applications and user-centric services. This special issue attempts to address these issues and includes extended and revised papers from the International Conference on Management of Emergent Digital EcoSystems (MEDES) held in the city of Lyon, France in 2009. After a very tight review process, we have selected seven out of 25 papers to include in this special issue and shed the light on the latest advances in the field of Web technologies.

In "A System for Centralizing Online Reputation", *Morad Benyoucef* and *Hui Li*, discuss online reputation systems to foster trust in online business and interpersonal interactions. Reputation systems collect, aggregate, and distribute feedback about participants' past behaviour. Although successfully used, current online reputation systems lack an important feature, which is globality. In fact, participants build a reputation within one community, and sometimes several reputations within several communities, but each reputation is bound to the corresponding community. In response to this challenge, they introduce an online reputation centralizer that collects raw reputation data about users from several online communities and allows for it to be aggregated according to the inquiring agent's requirements, using a stochastic trust model.

In "A Set Theory Analysis of Ecological Dependence amid an Agent Infrastructure in Beer's Viable System Model through Viable Computer Systems", *Ruth Thompson* deals with an innovated and emerging technology, known as Viable Computer Systems, which aims at surpassing the autonomic computing genre through analysis of cybernetic and mathematical bases of enquiry. She introduces an agent-based framework incorporating the environment as part of the system self-governance. Relevant properties of Beer's human-oriented Viable System Model are represented, towards reducing software redundancy within the industry. She

also presents pertinent attributes to enable homeostatic and temporal modelling of both the internal systemic capabilities and the environment and promotes a sense of self and thus viability through autopoietic emergence.

In "A Digital Ecosystem for Co-Creating Business with People", *Kimmo Karhu*, *Andrea Botero*, *Sami Vihavainen*, *Tingan Tang* and *Matti Hämäläinen* shed the light on the rise of Web 2.0, in which users become co-creators and software turns into services. In particular, they attempt to underline the digital ecosystem that ties technologies and business services. They provide a conceptual model of a digital ecosystem for understanding how companies can co-create business with people. To construct such a model, they use multiple case study approach and explore two cases: an ecosystem around smart phone application market App Store and an ecosystem around bioinformatics service registry BioCatalogue. Their results suggest that the required technical solutions and business services are now available. However, to make business flourish, they assume that the orchestration of the overall ecosystem is essential and needs to be taken care of.

In "Queries Routing In Super-Peer-Based System: Simulation and Evaluation", *Anis Ismail*, *Mohamed Quafafou*, *Gilles Nachouki*, and *Mohammad Hajjar*, study the Peer-to-peer (P2P) computing and, in particular, a new category of P2P systems called schema-based. In such systems each peer is a database management system in itself exposing its own schema. They tackle the efficient search across peer databases by processing each incoming query without overly consuming bandwidth. In their work, they propose a new architecture based on super-peers, which group together peers that have similar interests in order to provide efficient query routing methods. They also introduce the Knowledge-Super-Peers (KSP) concept to maintain information regarding super-peers and using data mining techniques. Finally, they demonstrate that the set of KSP improves the robustness in queries routing mechanism and scalability in P2P networks. Compared with a baseline approach, they argue that their proposal shows a better performance with respect to response time, precision and recall criteria.

In “Collective Intelligence Systems: Classification and Modeling”, *Ioanna Lykourantzou, Dimitrios J. Vergados, Epaminondas Kapetanios, and Vassili Loumos* describe a modeling process which identifies the common features, as well as the main challenges that the construction of generic collective intelligence systems poses. Firstly, they present a basic categorization of collective intelligence systems. Secondly, they introduce their modeling approach, which includes concepts such as the set of possible user actions, the collective intelligence system state and the individual and community objectives, as well as a number of necessary functions. Their approach identifies various parameters of the collective intelligence system, such as the expected user actions, the future system state and the level of objective fulfilment. Finally, based on their proposed modeling approach, they describe certain current collective intelligence systems and identify their problems and suggest specific solutions.

In “Extending SKOS for the practical, yet well-founded, representation and integration of Web schemas in the large”, *Matteo Palmonari* aims at supporting semantic Web-compliant representation of large amount of data and integration of conceptual models by providing users with light-weight languages. In order to avoid the design of complex Tbox axioms, he presents a language to achieve a good balance between expressivity and ease of use, namely the binary subset of AERIA, and defines its conceptual syntax, semantics, as well as its concrete syntax. The language is based on a SKOS extension with the capability to represent arbitrary relationships between concepts and abstraction-based mappings among concepts. The approach is also illustrated by means of a case study to explain the language benefits.

In “Linking Objects and their Stories: An API For Exploring Cultural Heritage Using Formal Concept Analysis”, *Peter Eklund, Tim Wray, and Jon Ducrou* describe a distributed systems and Web Services Architecture that supports a content management and collaborative tagging system for a Web-based cultural heritage site. They apply Formal Concept Analysis in order to infer semantic associations between objects and drive the navigation of its collection, and promote an extension of its capability by rendering such functionality via Web Services. Their proposed Web Services architecture supports a system called the Virtual Museum of the Pacific – a content and knowledge acquisition tool that permits the machine synthesis of formal concepts and provides a Rich Internet Application. The Web Services also permit the extensible association of digital objects by inducing new attributes and relationships from museum meta-data, and allow users and stakeholders to upload, annotate and attach rich media, YouTube or Vimeo links, and voice narratives to the objects. By rendering these capabilities as an open API, they encourage a connected and open approach to the sharing of cultural heritage and provide platform well suited for mobile devices, Web-based mashups, and data exchange between collection databases.

Finally, we hope this special issue inspires researchers to build innovative applications in distributed environments and take advantages of recent advances in Web technologies. We also would like to gratefully thank the reviewers for their valuable comments and the editors-in-chief for their efforts and painstaking editorial work during the preparation of this special Issue.



Richard Chbeir received his PhD in Computer Science from the University of INSA-FRANCE in 2001 and then his Habilitation degree in 2010 from the University of Bourgogne where he is currently an Associate Professor in the Computer Science Department in Dijon-France. His research interests are in the areas of multimedia information retrieval, XML and RSS Similarity, access control models, multimedia document annotation.

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