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Web2Touch 2016

Evolution and Security of Collaborative Web Knowledge

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Abstract — This report introduces the Web2Touch 2016, a Track at the 25th IEEE WETICE Conference. This track involves works from collaborative web knowledge research community and related themes. Web2Touch 2016 explores the state-of-the-art on users' practical experiences, as well as trends and research topics paving the way for future collaborative approaches to knowledge management. Papers come from areas such as computational analysis, management of contextual information, support to personalized information management, collaborative knowledge production, consistency, knowledge engineering and security modeling for multiple knowledge sources. The overall focus is on determining how to route, organize, and present contextual and meaningful information and services to facilitate collaboration.

Keywords — *semantic web; knowledge representation; collaborative web; safety; linked open data; web services*

I. WEB2TOUCH: OUR VISION ON COLLABORATIVE KNOWLEDGE ON THE WEB

The Web2Touch 2016 is a Track at the 25th IEEE WETICE Conference. This track involves works from collaborative web knowledge research community and related themes. The track theme of this year is the Evolution and Security of Collaborative Web Knowledge, which brings discussions on how the use of semantics, services, provenance, safety and intentions can enable the use of the web as a space of collaboration.

To date, great research efforts are being conducted in the area of information sharing and cooperative activities through the Web. Examples are computational analysis, management of contextual information, support to personal information management, collaborative knowledge production, consistency and security of multiple knowledge sources and so on. However, determining how to route, organize, and present contextual information to facilitate collaboration is a pressing challenge.

Sharing work, workspaces, data and processes are core aims of cooperative work. In fact, sparse activities can occur over different sites and repositories. These can be regrouped in one site to compose a whole business process to which various actors cooperate according to their abilities, expertise and business and security policies.

Collaboration using the Web introduces great challenges, especially when content needs to be consistent and reliable over time and under rapid evolution resulting from collaboration activities. The development of collaborative Web-based environments is an open research issue particularly on the topics of organization and management of shared information in a reliable and secure manner. Semantic Web techniques have been extensively used to address problems of knowledge management and sharing over the Web during the highly-dynamic life of cooperative applications. The focus till now has been mainly on static knowledge organization. However, the next generation of semantic techniques will have to face evolving knowledge organization and will need to cope with security, trust and reliability of what is exchanged in the Web.

A range of well-established and emerging interdisciplinary applications, each characterized by specific requirements and goals as follows:

- eScience – using and producing large amounts of heterogeneous data and finding new ways to share, link and reuse existing scientific knowledge and tools;
- eGovernment – improving access to government and helping organize the large number of webs of collaborative government knowledge and information beyond traditional wikis;
- eHealth – managing the ongoing transformation of health care systems and health data sharing from treatment to prediction and prevention, from healthcare to health management (i.e. keeping healthy), thus making everyone, not only patients, at the centre of the collaboration;
- smart cities and smart companies – enabling seamless and smart collaboration and information sharing between citizens and organizations, companies and their customers, to obtain a better and more sustainable living environment and services;
- entertainment – providing novel ways to document and maintain knowledge in collaborative environments involving users, testers and customers together with providers, in the current

trend of an increasing socialization, professionalization and globalization of interactive entertainment and services, from recreational to food and travel;

- eLearning and education – supporting new ways of collaboration among teachers and students around the world, deploying semantically marked-up and social-connected educational spaces, and enabling new knowledge sharing and integration

The papers in the 2016 edition of the Web2Touch Track aim at presenting alternatives to: automate runtime safety management in smart work environments; compose services based on users' profile, semantics and collaboration; retrieve information from electronic health records considering users' intention; calculate the linked open data similarity measures using ontological structures; extend provenance models for biodiversity and species identification; enrich government transparency portals with geo-spatial information; and, explore OWL-S models on semantic web services composition.

The papers present studies on how sharing knowledge, views, facts, and opinions in a highly dynamic Web-based environment can be managed through models and techniques for collaborative activities, considering also security, interoperability and reliability aspects of knowledge sharing. The motivations of the papers lay in the increased capabilities of the Web to cause qualitative changes in the nature of cooperative activities, which frequently happen at real time; thus, changing rapidly contents, contexts, methods, meanings and relationships with other pieces of knowledge and security collaborations.

The selected papers are proposed by researchers and practitioners who experienced applications which dynamic information sharing and needs of coordinated, trusted and secure alternatives to operate according to business and social rules. Web2Touch 2016 explores the state-of-the-art on users' practical experiences as well as trends and research topics paving the way for future collaborative approaches to knowledge management.

Papers come from areas such as computational analysis, management of contextual information, support to personalized information management, collaborative knowledge production, consistency, knowledge engineering and security modeling for multiple knowledge sources. The overall focus is on determining how to route, organize, and present contextual and meaningful information and services to facilitate collaboration.

II. SELECTED PAPERS

A. Full papers

The paper "Run-Time Safety Management Methodology in Smart Work Environments" by Mahsa Teimourikia, Mariagrazia Fugini and Enrico Zio presents an ontology-based methodology for treating safety in Smart Work Environments (SWE) at run-time. While traditional safety

and risk analysis methods are unsuitable, because they are typically manual, highly time-consuming and costly, this paper uses ontologies and logical reasoning to automate run time safety management. In this methodology, the SWE safety level is analyzed considering the current state of environment, tools and machinery, as well as the work activities. The ontology and an architecture that implement the methodology are presented and discussed in the paper.

The paper "Designing a Collaborative Middleware for Semantic and User-aware Service Composition" by Giacomo Cabri, Riccardo Martoglia and Franco Zambonelli presents a middleware proposal for composing services, which explores the users' profile, semantic similarity and dynamic aspects of collaboration. Their approach aims at producing more dynamic and sophisticated services composition improving the collaboration among different users. It is based on graphs, which are dynamically updated according to the users' collaboration, whose nodes are the services and whose arcs represent the composition between them. The weights for both nodes and arcs are used to evaluate the best path, which represents the most suitable composition for the users.

The paper "Intention-based Information Retrieval of Electronic Health Records" by Julio Cesar Dos Reis, Rodrigo Bonacin and Edemar Mendes Perciani presents an Information Retrieval method and algorithm that explores intentions, as explicit users' actions in information recovery. The search method is based on the annotation of meanings and categories of intentions in natural language textual description present in Electronic Health Records. The intentions are combined with standard knowledge representation systems of the health field with the objective of selecting and ranking the search results. The potentials and limitations of the method are exemplified using scenarios with real patient data.

The paper "LODS : A Linked Open Data Based Similarity Measure" by Nasredine Cheniki, Abdelkader Belkhir, Yacine Sam and Nizar Messai presents a Linked Open Data (LOD) similarity approach to estimates the matching degree between pairs of terms. This approach explores taxonomic structure of ontological concepts used to instantiate LOD resources, the classification categories of LOD resources, and their characterizing properties. The proposal was analyzed using DBpedia and interlinked datasets. The experiments point out that proposed measure approach gives good results, and data enrichment contributes to the enhancement of the similarity scores.

The paper "A Model of Provenance Applied to Biodiversity Datasets" by Flor K. Amanqui, Tom De Nies, Anastasia Dimou, Erik Mannens, Rik Van de Walle and Dilvan Moreira presents a biodiversity provenance model for species identification. This model extends the W3C PROV

Data Model and it allows checking the entire history of the data. A representative set of 206,000 records from the Botanical Institute (IBt/SP) was mapped in the study. The authors also made a GeoSPARQL endpoint available to experts in biodiversity to perform queries and answer scientific questions.

B. Short Papers

The paper “Increasing Open Government Data transparency with spatial dimension” by Nicoletta Dessì, Gianfranco Garau, Diego Reforgiato Recupero and Barbara Pes presents a framework to extract open government data from government portals and to collect them in a unified repository. This framework aims at empowering data with spatial features in order to enhance a better quality, transparency and understandability of the delivered information. A scenario in an open government portal illustrates the approach.

The paper “A Novel Approach for Semantic Web Service Discovery” by Randa Hammami, Hatem Bellaaj and Ahmed Hadj Kacem presents an approach for semantic web service discovery, and an algorithm to support users during the selection of the most appropriate semantic web service. The objective is to overcome the shortcomings of UDDI’s discovery mechanism using OWL-S language for description of web services. Algorithms for publishing and discovery are presented in the paper.

III. W2T TEAM

A. Program Committee

We could count upon the precious work done by the members of our Program Committee in reviewing all papers contributing to improve W2T content.

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