

Designing a thematic social network with research methodology content

Abstract—A thematic social network (TSN) is a space where users share information and materials about topics of a domain of interest. This paper describes the design of MInv, a TSN with the purpose of supporting users during the elaboration of academic documents such as articles, theses or technical reports. Ontologies are used to model users, concepts and the relationships between them. A prototypical version of MInv has been implemented using the Ning platform.

Keywords—*Social networks, ontologies, research methodology.*

I. INTRODUCTION

A social network can be defined as an established service site on the web which allows users to build a profile, manage a list of contacts, see and traverse their own connections or of other members [1]. A SN enables human communication regardless of time and geographic location.

Frequently, the analysis of SNs is based on concepts of graph theory such as nodes, links or paths. However, taking into account the topics of a SN, these can be classified as follows [2]:

- *Generic social networks.* They are the most numerous and well known; users can talk about any topic, for example, Facebook, Twitter, Myspace or Google+.
- *Social networking professionals.* The members of this type of SN are occupationally related; they use the SN to connect peers or to find a job. Some examples are LinkedIn, Xing and Viadeo.
- *Vertical or thematic social networks.* They are based on particular topics; they can connect people with the same hobby, the same activity or the same role.

Thematic SNs are developed for people with the same hobby to meet, share experiences, exchange information, pictures or videos of a common theme, where users need help or feel attracted. These networks have been used for different purposes, for example, tvcocina¹ (giving advice about food), Nosplay² (for gamers), Moterus³ (for people interested in motorcycles) [3]. In Education, Edmodo⁴ offers teachers and

students a place to collaborate and share content, while Academia.edu⁵ is designed with the purpose of promoting the publication of research results [4]. This paper describes MInv, a TSN designed to support the elaboration of documents such as articles, theses or technical reports frequently used during their training and education.

II. DESIGN STAGES OF MINV

This section describes the design stages of MInv. A brief explanation of each stage is included.

A. Domain of interest and identification of end users

Research methodology is the domain of interest of MInv, this is a discipline that consists of techniques and procedures in order to support the implementation of processes of collection, classification and validation of data in addition to those caused experiences of reality, from which people can build scientific knowledge [5]. At present, the scope of MInv is limited to 1) characterize the quantitative and qualitative approaches of research and 2) the elaboration of academic documents. Thus, end users are mainly students and professors of higher education and postgraduate programs. From our point of view, the main feature of the quantitative approach is that this uses the first data collection to test the hypothesis, based on the numerical measurement and statistical analysis to establish patterns of behavior and thus test a theory. Instead, the qualitative approach is distinguished by using data collection without numerical measurement to discover or affirm research questions in the interpretation process.

B. Designing and prototyping basic cases of use

Some activities of the User-Centered Design (UCD) are used to design MInv, mainly *designing, prototyping and evaluation*. UCD is based on the needs, objectives, expectations, motivations and capabilities of users; this helps to achieve greater satisfaction and better end-user experience [6].

The design of MInv is based on three basic cases of use:

1) *Log in.*— An administrator is in charge of pre-register users, he sends an invitation by mail and then the user needs to access the site and select a password. A photograph and a semblance are useful to complete the profile. Figure 1 shows

¹ Available at: <http://www.tvcocina.com/>

² Available at: <http://www.nosplay.com/>

³ Available at: <http://www.moterus.es/>

⁴ Available at: <http://www.edmodo.com/>

⁵ Available at: <http://www.academia.edu/>

the implementation of this case of use. The panel on the left includes the logotype for MInv.

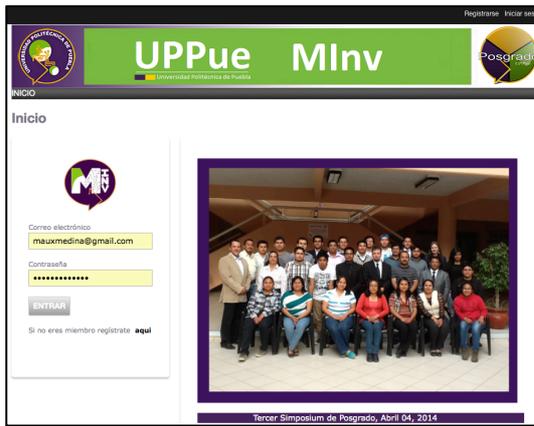


Fig. 1. Log in interface for MInv users

2) *Content organization.*- MInv allow users to download, read, write or comment the content of multimedia and text files. A set of icons has been design to make reference to the type of resource. MInv is available at: <http://rs-uppue.ning.com>

3) *Knowledge management.* There are two levels for knowledge representation in MInv. The first level is addressed to end users and basically consists of displaying conceptual maps that define or characterize concepts of research methodology. For example, Figure 3 tries to describe the importance of research objectives.

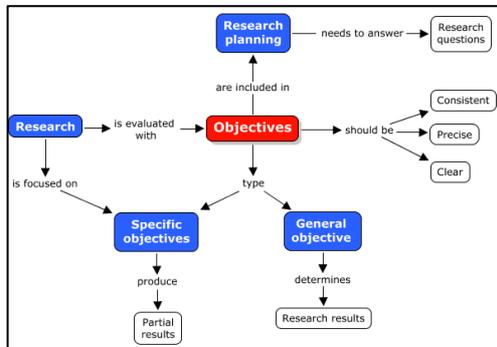


Fig. 3. Role of research objectives

The second level of knowledge management is based on ontologies that store concepts and relationships in OWL language; this level is proposed to support knowledge management tasks. Ontologies are used to store specific information as types of users, characterization of materials and relationships between users and materials. For example, Person is one of the main classes, this uses name and email as data properties; this is divided in two disjoint subclasses: Student and Professor. Another relevant class is Resource, which has two subclasses: Document and Multimedia. The first subclass is used for all kind of textual resources; while

videos, images or audios are considered instances of the second subclass. Actually, there are 24 classes and subclasses.

Ontologies enable the use of synonyms and the model of formal concepts as symmetry or reflexivity; they include object properties that allow users to establish binary relationships between instances. Table 1 shows the domain and range of some object properties.

Label for the objet property	Domain	Range
uploadedBy	Resource	Person
commentedBy	Resource	Person
hasArticle	Articulo	Journal
hasChapter	BookChapter	Book
madeBy	Thesis	Author

Ontologies are edited using Prótege 4.3. Consistency validation is done with Fact++ reasoner that is pre-loaded in this version. There are different platforms that support the implementation of SNs like SocialGO⁶, Grouply⁷ and Ning⁸, the latter has been chosen for MInv, this offers full access to membership data, mobility and adaptive design.

III. CONCLUSIONS

We have presented MInv, a TSN designed to support the elaboration of academic documents and the acquisition of some concepts of research methodology. From our point of view, the differentiating element of MInv is the use of ontologies as an alternative to separate operative knowledge from theoretical aspects; this fact allows us to make future semantic social network analysis.

As future work, we plan to integrate questionnaires to create and maintain the profiles of end users.

References

- [1] Boyd, d. m. & Ellison, n. b. (2007). "Social network sites: Definition, history, and scholarship". Journal of Computer-Mediated Communication, 13 (1), artículo 1. Consultado el 24 de enero de 2014 en: <http://onlinelibrary.wiley.com/doi/10.1111/j.1083-6101.2008.00408.x/full>
- [2] Fonostra, 2013. Redes Sociales. Disponible en: <http://www.fonostra.com/digital/redesociales.htm>
- [3] Congreso Iberoamericano Sobre Redes Sociales. 6-7 de marzo 2014, Burgos, Mapas de redes sociales en Iberoamérica versión 2, 2010 <http://www.iredes.es/wp-content/uploads/2010/10/mapagigante-web.jpg>
- [4] Valenzuela Argüelles Rebeca, 2013. "Las redes sociales y su aplicación en la educación". Revista Digital Universitaria 1 de abril 2013, Volumen 14, Número 4, ISSN: 1067-6079 Disponible en: <http://www.revista.unam.mx/vol.14/num4/art36/art36.pdf>
- [5] Hernández Sampieri Roberto, Fernández collado Carlos y Baptista Lucio Pilar, 2006, Metodología de la investigación, 4ta edición, McGram-Hill Interamericana, ISBN 970-10-5753-8
- [6] Pradeep H. User-Centered Information Design for Improved Software Usability. 1998. Artech House Publishers.

⁶ Available at: <http://www.socialgo.com>

⁷ Available at: <http://www.grouply.com>

⁸ Available at: <http://www.ning.com>