A Study on the Potential Advantages of the use of Social and Semantic Web Applications within Innovative Cooperative Organizations

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Abstract. The social Web has been the major driver of change in the way people interact nowadays. The social Web is about connecting people and fostering social participation. This has been a step forward with respect to the "previous version of Web" (Web 1.0) where the focus was on connecting and getting information. However, research on the Web Science is also focused on the formalization of the Web in order to achieve the promised semantic Web. The Web is already changing success factors in the business world and organizations must be aware of the latest trends within this field in order to survive. The main area of concern nowadays is innovation, as the source of competitive advantage. The aim of this work is to assess the potential advantages of the adoption of the social and semantic Web applications for innovation processes within cooperative organizations.

Keywords: social web, semantic web, open innovation, crowdsourcing

1   The Problem

Since the WWW went public in 1991 its adopters and its applications to the society in general have increased meaningfully. From the era of corporate static websites with one way interaction that characterized the Web of the late 90s and that ended up with the dot-com bubble we have entered into the so called Web 2.0 era or the Social Web for those who avoid buzzwords. The Social Web is a new generation of Web applications and technologies based on a philosophy that fosters the participation of the user in the Web and the favors the openness of the Web itself. This practical view of the Web contrasts with the Semantic Web view set out by Sir Tim Berners-Lee in 2001 [1] where he advocates for an intelligent Web able to manage user knowledge effectively using semantic technologies.

The importance of the developments within the Internet world is leading to the formation of different interest groups on the issue like the "Future Internet" initiative fostered by the European Union. One of the main fields of research of great interest

for organizations is the application of these technological developments on the business world and the society. The Internet and the Social Web is already changing success factors in the business world and organizations must be aware of the latest trends within this field in order to survive. The main area of concern nowadays is innovation, as the source of competitive advantage. With the arising of new emerging economies, the business world is turning into an era of extreme competition where the only way to succeed is innovation [2]. That is exactly one of the building blocks of the Lisbon Strategy set up by the European Commission back in 2005, innovation as the motor of business change.

Organizations have traditionally relied on internal R&D resources in order to carry out innovation processes. However, with the advent of the social Web, unprecedented participation possibilities are at the hands of Web users. This trend poses new challenges to organizations and many of them are opening their innovation processes. The motivation behind user participation can vary but this phenomenon, coined as crowdsourcing by Jeff Howe in [3], has given birth to well-known initiatives like Wikipedia or Linux (previous to Web 2.0 phenomenon) and has allowed various organizations (e.g.: Procter & Gamble, IBM, Air Products,...) redefine and accommodate their business models and value propositions to customers' needs in a way nobody had been able to do it before.

As mentioned in the previous paragraph the social Web (a.k.a.: Web 2.0) has been the major driver of change in the way people interact nowadays. The social Web is about connecting people and fostering social participation. This has been a step forward with respect to the "previous version of Web" (Web 1.0) where the focus was on connecting and getting information. However, research on the Web Science [4] is an ongoing issue and currently there are plenty of initiatives towards a formalization of the Web in order to achieve the promised semantic Web. The social and semantic Web (a.k.a. Web 3.0) is about representing meanings, connecting knowledge and putting these into work in ways that make users' Web experience more relevant, useful and enjoyable. Even if there are not many case studies on the joint application of the semantic and social Web some authors are already publishing advances in this field [5] [6] [7].

The aim of this document is to set the context to the research to be undertaken on the implications of the social and semantic Web on innovation processes within cooperative organizations. The cooperative organizations, due to their particular features, are aligned with the background philosophy of the social Web and are a very interesting case study for the application of such concepts.

2 Aims and Objectives

The main objective of this research is to accelerate the adoption of social Web applications and principles within cooperative organizations with a particular focus on

boosting the innovation processes within these organizations. For this purpose a set of socio-economic and technological objectives have been defined:

- Perform a survey on the adoption of social Web applications and principles within cooperative organizations.
- Perform piloting activities on the use of social and semantic Web applications in support of innovation processes within cooperative organizations.
- Develop an innovation management system and a governance model based on the use of social and semantic Web applications.
- Analyze the synergies between semantic Web applications and social Web applications.
- Deploy prototypes of social and semantic Web applications within several cooperative organizations in order to foster innovation processes.
- Assess the applicability and benefits of the social and semantic Web applications within the innovation processes of cooperative organizations.

3 Research Methodology

The work is validated in all phases of the project. The engineering cycle integrates requirements and needs specification, the implementation showing that the requirements are feasible, validation showing that the system fulfils needs etc. Experience from all phases is continuously utilized to improve the next cycles of development.

The following points summarize the activities within each phase:

- Requirements. In this phase the requirements will be collected from two main sources: end users and state of the practice research. With regard to end user requirements, a field study will be performed through a set of interviews to different representatives of cooperative organizations in order to assess the use of semantic and social Web technologies. This input, together with the state of the practice research will be used to depict the case studies.
- Implementation. Once the requirements are gathered the necessary prototypes and the methodology will be developed. The prototypes will be in the form of Web applications for different purposes based on semantic and social technologies. These applications won't be developed from scratch, the aim of this project is to build on cutting-edge existing working solutions and apply them to the industry. The methodology will provide a stepwise approach for the adoption of the prototypes within an organization.
- Validation. During the validation phase a set of piloting activities will be carried out within at least one organization surveyed previously. These activities will be based on the depicted case studies and will serve as the validation of the prototypes proposed in the project. A set of indicators will be set up in order to evaluate the result and the success of the project.

This research follows a very empirical approach and hence the results are to be validated in real-world business scenarios in order to assess the impact of the usage of social and semantic Web applications within innovation processes of cooperative organizations. For that purpose an initial set of short-term measures have been identified:

- Number of social and/or semantic Web application components used
- Number of ideas generated in ideas marketplaces
- Number of successful ideas (ideas that meet initial requirements)
- Number of employees taking part in innovation processes
- Number of external entities involved in innovation processes
- Degree of satisfaction with social and semantic Web tools
- Degree of top management involvement

In the long-term other measures should also be taken into account:

- Number of new products/services and new businesses launched
- Percentage of revenue from new products/services and new businesses launched
- Number of new partnerships with external entities
- Revenue growth
- Generated knowledge

Apart from the expected impact, some preliminary work has been carried out in the field that is summarized in the following points::

- State of the art report on Web interfaces (March 2008). Deliverable within the PLATA project funded by the Spanish government under the AVANZA Programme. This document describes the latest applications and technologies associated to rich Web interfaces, one of the pillars of the social Web [8].
- Assessing the Readiness for Enterprise Collaboration and Enterprise Interoperability (June 2008). Article accepted in the 14th International Conference on Concurrent Enterprising in Lisbon. The article introduces a methodology based on maturity models for the adoption of good collaboration and interoperability practices supported by social Web applications [9].

Besides, there are other ongoing activities relevant to the research project within the context of projects funded by both Basque and Spanish governments. In the former case, the MERLIN project [10] analyzes the applicability of social networks to industrial enterprise environments for the fostering of innovation and entrepreneurship. The GERION project [11] funded by the Spanish government aims at the deployment of an innovation platform within a group of cooperative SMEs belonging to the Engineering and Services Division of MONDRAGON. Through these projects an initial introduction of social Web applications (mainly wikis) within cooperative organization environments has been achieved.

Building on this existing work, there is a tentative plan for the future work that includes two main milestones in the short term: a survey on the adoption of social Web applications within Basque organizations and the creation of a virtual innovation community within the Engineering and Services Division of MONDRAGON Corporation.

4 Expected Contributions

Without any doubt, one of the most influential technological trends nowadays is the social Web. The social Web is characterized by social principles and technologies that promote the participation of the user on the Web. Many organizations have already adopted these pioneering principles and technologies successfully in most cases, a phenomenon that has been coined as Enterprise 2.0, Government 2.0 and so on depending on the type of organization where they are applied. In the case of cooperatives, there are not known cases of success, which is quite contradictory as many of the principles that characterize the cooperatives are closely aligned with the principles of the social Web.

On the other hand, the semantic Web is starting to deliver useful applications for the intelligent management of information. This aspect seems to be crucial with the increasing adoption of social Web applications that favor the generation of large amounts of data. As mentioned before, both the social Web and the semantic Web are said to merge in a near future giving birth to the so called Web 3.0. There are already some examples of social and semantic Web applications but there is a lack of successful industrial case studies so far.

Among the most interesting social and semantic Web applications three sub-types of applications can be distinguished: social applications, semantic applications and social and semantic applications. Among the first ones is worth mentioning the well know components that shape the social Web: social networks, blogs, wikis, mashups… [13]. Semantic applications have received a great boost lately, especially within the semantic search field with announcement of new semantic functionalities by Google [14] in response to the launch of the Kumo semantic search engine by Microsoft [15]. Other interesting applications include ontology building environments and semi-automatic semantic annotation tools [16]. Finally, the blending of the two approaches is also represented by applications and technologies like semantic wikis, semantic blogs or semantic mash-ups. The research project will build on all the existing social and semantic applications mentioned.

The work presented here intends to contribute both to the social and semantic Web applications fields through the provisioning of successful industrial case studies. These case studies will be focused on the improvement of innovation processes using social Web applications to design an efficient architecture of participation [12] and semantic Web applications to perform an intelligent management of the generated information.

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