



Open Innovation in an Enterprise 3.0 framework: Three case studies

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ABSTRACT

Nowadays, especially after the recent financial downturn, companies are looking for much more efficient and creative business processes. They need to place better solutions in the market in a less time with less cost. There is a general intuition that communication and collaboration, especially mixed with Web 2.0 approach within companies and ecosystems, can boost the innovation process with positive impacts on business indicators. Open Innovation within an Enterprise 2.0 context is a one of the most chosen paradigm for improving the innovation processes of enterprises, based on the collaborative creation and development of ideas and products. The key feature of this new paradigm is that the knowledge is exploited in a collaborative way flowing not only among internal sources, i.e. R&D departments, but also among external ones as other employees, customers, partners, etc. In this paper we show how an ontology-based analysis of plain text can provide a semantic contextualization of content support tasks, such as finding semantic distance between contents, and can help in creating relations between people with shared knowledge and interests. Along this paper we will present the results obtained by the adoption of this technology in a large corporate environment like Bankinter, a financial institution, Telefonica I+D, an international telecommunication firm and Repsol, a major oil company in Spain.

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1. Introduction

In recent years a growing number of companies modified their innovation process towards the Open Innovation paradigm (Chesbrough, Vanhaverbeke, & West, 2006): in a world of widely distributed knowledge, companies do not have to rely entirely on their own research, but should open the innovation to all the employees of the organization, to providers and customers. Open Innovation is based on the collaborative creation and development of ideas and products.

The introduction of the Open Innovation paradigm in an enterprise entails not just a modification of the corporate process of innovation but also a cultural change which require support by an advanced technological infrastructure. Corporate knowledge has to be made explicit, exchanged and shared between participants, and therefore tools for knowledge management, analysis support and information structuring are required to make these tasks affordable and the data available to all the involved actors. In addition, tools for innovation process support need to provide a high degree of interactivity, connectivity and sharing. In a scenario in which collaborative work is not supported and members

of the community can barely interact with others, solutions to everyday problems and organizational issues rely on individual initiative. Innovation and R&D management are complex processes for which collaboration and communication are fundamental. They imply creation, recognition and articulation of opportunities, which need to be evolved into a business proposition in a second stage. Interactivity, connectivity and sharing are the features to consider when designing a technological framework for supporting collaborative innovations (Gloor, 2006). All these characteristics can be identified in an Enterprise 2.0 (McAfee, 2006) environment where editing and creating documents is easier and interaction and collaboration are key aspects.

However, Enterprise 2.0 tools do not provide formal models for the creation of complex systems managing large amounts of data, and this can be overcome by incorporating Semantic Web technology (Fensel, Wahlster, Lieberman, & Hendler, 2002). Semantic Web can contribute introducing computer-readable representations for simple fragments of meaning and therefore could provide a technological framework for semantic contextualization of the contents, identification of semantic distance between contents and creation of relations between people with shared knowledge and interests Penela et al. (2011).

In this paper we show how an semantic analysis of plain text can provide a contextualization of content support tasks, such as finding similarities between contents, and can help in creating relations between people with shared knowledge and interests.

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Along this paper we will present the results obtained by the adoption of this technology in a large corporate environment like like Bankinter, a financial institution, Telefonica I+D, an international telecommunication firm and Repsol, a major oil company in Spain. We explain how basic usage of semantic technology can improve the performance of Enterprise 2.0 based knowledge management systems in large corporations.

In the following section we describe the Open Innovation process and the reasons why corporations changed from the classic model to this new paradigm. The introduction of a new process in which a high level of interaction is involved requires the adoption of specific tools to support each of its phases. For this reason we analyse the evolution of collaborative tools towards Enterprise 2.0 and the integration of such tools with semantic technologies. In Section 3 a detailed description of the process is presented and thanks to a top-down approach, starting from the analysis of the process phases and user activities, a technological framework is defined. The architecture and the implementation aspects are illustrated in Section 4, while in Section 5 evaluation issues are presented.

2. The innovation business process supported by collaborative tools

2.1. Open Innovation: a new paradigm

In the last century innovation has been identified as a critical business process: first Schumpeter (1934, 1942) acknowledges the importance of this process in the corporate development. At that time innovation is focused on the improvement of the economy of scope: the creation of new products is necessary to gain and defend a competitive advantage. Only in the 1990s corporations start adopt innovation for enhancing business process efficiency pursuing a better economy of scale. Nonetheless this model soon revealed to suffer deficiencies that made it unfit for innovation today: in the vertical innovation described by Chandler (1990) innovation is the result of an internal process lead by few people in the R&D department and everything which has not been invented in the company is not suitable for the company. This represents the first syndrome: the “not invented here syndrome” (Chesbrough et al., 2006). Moreover everything which has not been sold by a company cannot be sold by someone else and licensing and spin-offs are not considered as options: this is the “not sold here syndrome”. It has also to be considered that nowadays knowledge is widely distributed and new tools support the daily tasks of any corporation. Those factors (inability of adopting external knowledge and technology, difficulties of seeing opportunities which do not fit the current business model, distributed knowledge

and the arising of new collaboration technologies) lead to the definition of a new model: Open Innovation. The Open Innovation paradigm opens up the classical funnel to encompass flows of technology and ideas within and outside the organization (Fig. 1): the duration of creation, recognition and articulation of opportunities can be drastically shortened if ideas come not just from the R&D department.

Ideas are pushed in and out the funnel until just a few reach the stage of commercialization. Technologies are needed to support the opening of the innovation funnel, to foster interaction for the creation of ideas (or patents) and to push them through and inside/outside the funnel. Gloor (2006) defines the “Collaborative Innovation Networks” as “a cyberteam of self-motivated people with a collective vision, enabled by the Web to collaborate in achieving a common goal by sharing ideas, information, and work”. As we stated in the introduction, the technology framework identified by Gloor has to grant a high degree of interactivity, connectivity and sharing (Fig. 2).

2.2. Enterprise 2.0

Platt (2007) states that innovation, together with marketing and training, is one of the processes which could most benefit from the introduction of Enterprise 2.0 tools in a company. With Enterprise 2.0 the collaborative philosophy of Web 2.0 is adopted in a firm: users (and employees) are not mere consumers of content but also creators of content. McAfee (2006) describes how Web 2.0 tools can be introduced with success in the corporate scenario and defines the six pillars on which Enterprise 2.0 stands: search, links, authoring, tags, extensions and signals (SLATES). McAfee also stresses the importance of the support of the managers of the company. However Web 2.0 presents the same limits: if a large group of users is given the opportunity of easily generating new content, the amount of information grows exponentially. Providing access to this overwhelming mass of data becomes a difficult challenge. Enterprise 2.0 tools do not provide formal models for the creation of complex systems managing large amounts of data, and this can be overcome by incorporating Semantic Web technology (Fensel et al., 2002). Semantic Web can contribute introducing computer-readable representations for simple fragments of meaning. In the next section we identify points of improvement of Enterprise 2.0 thanks to the introduction of semantic technologies.

2.3. The introduction of semantic technologies: towards Enterprise 3.0

Berners-Lee describes his vision of the Semantic Web in these terms: “The Semantic Web is not a separate Web but an extension

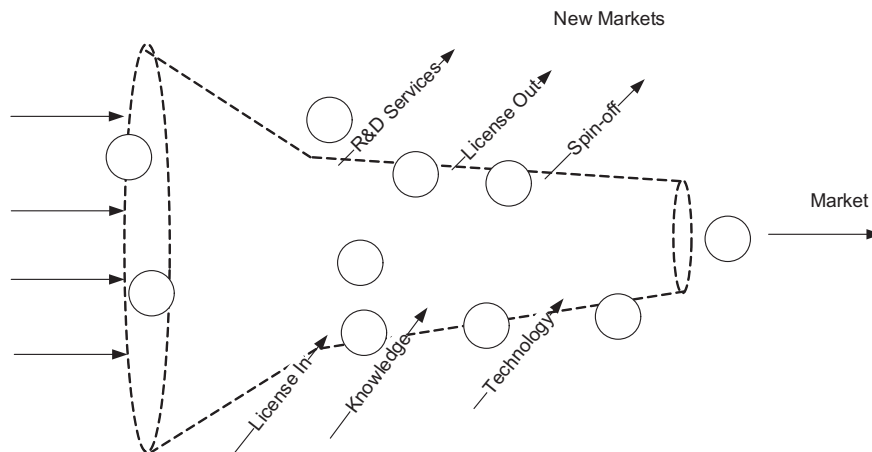


Fig. 1. Open Innovation.

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