A Case Study on the Use of Community Platforms for Inter-Enterprise Innovation

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Abstract

This paper is enshrined in a larger research project which main goal is to determine key factors in the design, implementation and use of collaborative environments for the management of inter-enterprise innovation processes based on practical experiences. The paper presents an innovative approach to address the challenge of collaboration and participation in the submission of new ideas in the front end of the innovation process. The paper describes a case study on the adoption of an open source community platform based on Drupal in the context of a set of cooperative companies within Mondragon Corporation. The platform leverages social computing, real-time Web and semantic technologies to support collaboration, basic technology watch and idea management in the early stages of the innovation process. Preliminary field results show that the platform provides a powerful collaborative tool that eases administration work and enhances collaboration among participants.

Keywords

Collaborative Innovation, Innovation platform, Drupal, Social and Semantic Web

1 Introduction

Following on the research on innovation and idea generation methods proposed in (Errasti, et al. 2010) this work describes a case study on the gradual adoption of an open source community platform based on Drupal in the context of a set of cooperative companies within Mondragon Corporation.

This research focuses on the results obtained after deploying and running the first of a series of prototypes for a collaborative innovation platform based on social and semantic software. The prototype has been applied in the context of technology and business innovation idea generation for the previously mentioned group of companies belonging to Mondragon Corporation.

The next section outlines the research context. The third and fourth sections respectively describe the objectives and the proposed approach and depict the case study. The fifth section makes reference to the results obtained and to the conclusions withdrawn from this research so far. The last section summarizes the next steps to be taken in the overall research project.

2 Research context

This section summarises the concepts of innovation, enterprise social software and platforms for the support of the innovation process outlined in our previous work. As a starting point for this paper the conclusion for the previous study and the collaborative innovation platform development requirements and methodology identified in the overall project are also outlined. In this section authors also make reference to the companies that compose Mondragon Corporation, as they form the context where this research work and case study are being developed.

2.1 Innovation

Innovation is the way to reach and gain competitiveness for companies in today´s turmoil. In (Errasti, et al. 2010) a thorough study on the innovation process and different innovation models was conducted. The following conclusions were identified:

- A common space to represent and gather all the information related to innovation processes is needed. This common platform will be used to collect ideas, identify experts, introduce comments, follow idea progress or search for similar ideas among other.
- The advantage of using social networks in organizations is clear. In these networks, employees could develop contacts, share their knowledge, improve the communication between experts that do not know each other, gather interest in their own projects or ideas and identify professional opportunities.
- For some years the business world has experienced changes in the models organizations used to innovate. There are basically three parameters to classify collaborative innovation models: the innovation area's definition degree (defined or emergent), collaboration's openness degree (open or closed networks) and the form of government (hierarchical and centralized or shared flat). Most innovation models show a similar baseline. The main difference lay in the particularities incorporated to the model in each particular case. For example the innovation process for a firm-centric model considers participants and resources within the organization while a network-centric model extends the same process outside the organization´s borders.
- The phase of the innovation process where idea management is developed is one of the most critical stages. The main difficulties are therefore related to the very first phase of innovation, the front end of the innovation process, where idea creation, enrichment and selection are involved.
- Innovation requires the opening of collaboration frontiers among enterprises and people. In this era of massively connected world, collaboration is indispensable in order to survive within the business world. Existing innovation models have failed due to their internally driven nature and the lack of support from users. Research work in (Jaruzelski et al. 2005] concludes that investing on innovation does not guaranty success if process quality and collaboration are not ensured.

2.2 Enterprise social software and innovation platforms

The popular demanded enterprise social networking applications provide functionalities similar to those of Facebook or LinkedIn but with more control and governance. Firms are using them to connect with customers or partners and to facilitate collaboration among employees. Besides, the increasing interest in idea management systems (Conry-Murray, 2010) has pushed community platform vendors to integrate idea management and community software into a single type of platform that includes idea management functionalities and social technologies.

As social networking started to grow in popularity a new breed of Web applications took on the market among enterprises; community platforms. These platforms can be seen as an evolution of classic enterprise collaboration platforms like IBM Lotus Notes and Microsoft Sharepoint. Among the core features, community platforms offer all the functionalities inherited from social Web technologies like blogging, wikis or social networking (Parrish, 2010).

The research conducted by our team in this area includes the analysis of architectures of participation such as Facebook, Digg, Wikipedia, actual platforms that support innovation processes such as IBM Idea Factory, IdeaScale Innocentive, SalesFoce Idea Management, Hominex, Mindmeister and LaboraNova, and other platforms or solutions for supporting the early stages of the innovation process such us community platforms. Among this last group IBM Lotus Connections 2.5, Microsoft Office Sharepoint, Brightidea, Imaginatik Idea Central, Jive

SBS, Elgg, Drupal, Liferay, Joomla y Plone were included. Over 20 factors were considered as the comparison criteria for the different platforms. The most relevant criteria is; type of license, ease of use, developing language, operative system, integration with social networks, integration with real time web, integration with semantic web, blogs, wikis, RSS, email, etc.

The main conclusions are as follows:

- The use of social webs in the context of enterprise is very incipient. Many barriers are detected, above all organizational barriers such as no implication of managers, need of a cultural change or hierarchical structure. However, initial data show very quantifiable benefits and there is no doubt about the upward trend of adoption of these technologies. A high percentage of companies have planned to increase the investment in 2.0 technologies.
- There are open source platforms with similar characteristics to proprietary software. Proprietary platforms are discarded. The inclination to select open source is reinforced.
- Any existent or new innovation support platform must consider the integration of its mechanism with most popular social web platforms, such as Facebook or Twitter in order to be successful by means of participation. Share ideas among those platforms guarantees reaching collaborators and in some cases open the process to new participants.
- SemanticWeb technologies can support information management and consequently contribute into better idea generation tasks. Especially, Semantic Web can help in keeping all the information structured in electronic files accessible by anyone from anywhere. Moreover, intelligent agents can then deal with this structured data, to avoid direct human interaction, for instance when searching for new ideas. It can also strengthen ideas by complementing proposed ideas with content found automatically in other sites or repositories.
- Drupal and Liferay have obtained the highest score, but the dimension of actual and potential community of users and the effort made by the community of users to integrate semantic technology or web 3.0 currently favors Drupal.

The last issue of the series of McKinsey reports on Web 2.0 adoption shows very positive results on the use of social technologies and a majority of respondents say their companies enjoy measurable business benefits from using Web 2.0 (Bughin et al, 2010). Among the main benefits, the increasing number of successful innovations accounts for 28% and 20% of respondents who acknowledge benefits in internally facing and inter-enterprise innovation efforts respectively.

2.3 Requirements and Methodology

Although many idea management tools are available, in the literature survey a community software platform that integrates all the stages of the innovation process gathering information (ideas, events, experts, outcome, etc) and at the same time providing mechanisms to share that information through the social web, in real time and providing semantic format to content has not been found.

The main goals to be achieved with such a platform are the following:

- A unique framework to gather all the aspects related to the innovation process (ideas, contests, authors, outcome, companies, etc.)
- Be able to articulate a successful architecture of participation around the platform.
- Be able to communicate efficiently in real time.
- Allow the relation not only between ideas, ideas and experts, ideas and outcome, etc., but also among external content.

To achieve these goals our previous research identified up to 25 functional requirements to be implemented on a prototypical collaborative innovation management platform based on Drupal the selected technology for the enterprise social software.

The agreed methodology approach is based on an incremental development cycle, where requirements guide implementation and the use of prototypes during validation generates new requirements. The approach is thus validated in all phases of the project. Experience from all phases is continuously utilised to improve the next cycles of development. In each phase 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 social technologies integrated into a fully fledged social Web platform. During the validation phase a set of piloting activities will be carried out within at least one organization surveyed previously. These activities will be performed within real production scenarios and will be based on the depicted case studies. A set of indicators will be set up in order to evaluate the result and the success of the project.

2.4 Mondragon Corporation

The companies that compose Mondragon Corporation (http://www.mondragoncorporation.com), are conscious of the growing need for innovation in order to remain competitive. Innovation has become a social phenomenon, and new governance models, managing tools and mechanisms, are needed to dynamize the process.

These companies know that each of them by itself has a short life expectancy, and that in order to become strong, interaction with surrounding agents and collaboration are mechanisms that must be used. But, how could they do that? Many of them are familiar with the use of the web 2.0, and use social software, but the main problem is that most of them use different software, which is not compatible in many cases, and so interacting becomes an impossible task. This is one of the main reasons for beginning this research work.

The aim of the corporation is to foster innovation, and they understand that collaboration is required for this purpose, but it's easier said than done. They wish to achieve a collaboration environment, where different agents such as providers, competitors, customers or anyone willing to collaborate could do so. Providing an answer to this challenge is the second reason for beginning this research work.

3 Objectives

Taking into account the overall perspective of the research project this paper aims to develop a baseline social networking platform to support the front end of the innovation process (idea collection, idea analysis, idea enrichment and idea selection) that will be flexible to grow in further phases of the overall project. This paper presents an innovative approach to address this challenge through the description of a case study on the adoption of an open source community platform based on Drupal in the context of a set of cooperatives within Mondragon Corporation.

The objectives at this point of the research project and addressed in this paper are the following:

- Deploy the baseline platform on Drupal representing each of the stages for the innovation process (idea creation, analysis, enrichment and selection).
- Provide a set of tools for each of the four stages identified.
- Prepare information collected with semantic meaning to be later exploited.
- Apply the deployed platform launching idea generation campaigns within a set of companies (case study).
- Analyze the success factors of these idea generation campaigns considering the metrics defined in our previous studies and propose new metrics.

4 Proposed approach

In order to represent the stages of the early front-end of the innovation process and the interaction or workflow among them, existing Drupal modules have been customized as needed. Besides, new Drupal customized PHP modules have been developed for idea evaluation and graphical representation purposes. The following points show the different stages of the innovation process and the supporting tools implemented:

Idea creation stage

- New ideas are introduced in blog format, classifying ideas according to tags and allowing comments on them. Additional information such as author, organization, source, date or rating is also registered.
- Idea editors and graphical maps for tag, idea, author or organization have been developed in modules to support the introduction of new ideas and help the users in the classification of ideas.

Idea analysis stage

- Idea editors, graphical maps and automatic blog to wiki converters are provided to support the analysis and filtering of ideas where authorized agents examine submitted ideas, selecting, combining and editing the most significant ones

Idea enrichment stage

- Ideas are place on wikis where authorized users place their contributions.

Idea selection stage

- A new idea selection module has been developed where criteria are established and scoring of ideas is performed to help in the idea selection stage.

4.1 Semantic Web technologies

One of the reasons for the development of a new idea management platform build on Drupal is the capability brought by this community platform to incorporate semantic web structures and meaning to idea content. An initial experiment on the use of Semantic Web technologies has been carried out. The objective of this experiment is to mark ideas with metadata and store with Semantic Web format. This mapping of content with metadata is done during the idea creation stage. Ideas are offered in RDF format through SPARQL endpoints using the idea management ontology and the Drupal module RDFme proposed in (Westerski et al, 2010). Thus, new ideas introduced through the platform, automatically join the structured data on the Web, following the Linked Data principles described in (Berners-Lee, 2009). The full potential of Semantic Web technologies and Linked Data initiative will be exploited in future work to support the search, identification, classification, association and enrichment of ideas.

Parallel to this work, our research team has worked on the development of an ontology to semantically structure the innovation process. This ontology is based on idea management existing approaches such as GI2MO (Westerski et al, 2010) and (Riedl et al, 2009). Our research activity (Lorenzo et al, 2011) on Semantic Web for the innovation process will be presented at the International Conference on Weblogs and Social Media (ICWSM-11).

4.2 Case Study

Since this is the first experience of this type in the corporation, the aim at this stage was also to define the overall objectives for all the case studies to be conducted. These are the following:

- Gradually establish a cooperative culture in all aspects of innovation through the baseline platform.

- Establish new metrics that will enable a better understanding of the issues related with the innovation process.
- Analyze the factors behind the successful deployment of social Web applications within cooperative organizations.

For this case study the defined process and the support generic platform have been experimentally applied in the context of technology and business innovation idea generation for a group of companies belonging to Mondragon Corporation. The areas of interest for these organizations go from automotive industry to industrial machinery and also include tool manufacturing. This first prototype has been deployed as a private inter-enterprise social networking platform among 7 cooperatives and was launched in February 2011. In order to measure the use and performance of the social networking community platform a set of metrics has been defined including traffic, structural and activity metrics (page visits, repeat visitors, number of members, percentage of active members). In order to monitor the idea generation process innovation metrics (submitted ideas, percentage of commented ideas) have been set. The case study has been conducted under the conditions and has produced the data shown in the next paragraphs.

- 27 users have been registered into the platform. From those two have the role of community managers, 5 users have the role to evaluate (a role created to assess ideas), and the rest are standard users that can introduce, comment and vote on ideas.
- Ideas from previous contests have been including to the platform adding to a total of 108. The aim pursuit by this measure is to provide a base of previous ideas to use as reference.
- Among the members, 22% is considered active user because of their contributions in creating ideas, voting on the ideas or making comments about the ideas.
- About 50% of new ideas submitted have received more than one positive vote, no negative feedback for the moment.
- About 40% of new ideas submitted have been commented by other members.
- The percentage of returning visitors is 32%

Although the case study is still at an early stage, it can be concluded that user activity is satisfactory and higher than in previous idea contests. This higher activity turns into not only better knowledge about existent ideas, but also into the quantity and the quality of those ideas. Ideas from previous contests lack of interaction and feedback between members. The previous format consisted on arranging closed meetings where ideas were further developed and participants did not have a broad view of which ideas were published.

Field results obtained with the conducted case study show that the process responses to the requirements identified in the front-end of the innovation process (idea generation and management) and that the platform provides a powerful collaborative tool that eases administration work and enhances collaboration among participants. Offered with the new Drupal platform, ideas are shared, used as reference, complemented and commented.

It has been identified that further data needs to be collected to fulfil all the metrics established and to have more representative information. The collection of data will continue in this case study but also in new case studies to be carried out in the corporation different divisions; education, engineering and service, and distribution. More metrics are also necessary in order to better understand the innovation process. The most significant metrics identified at this point are:

- Number of ideas that become successful. This is ideas that turn into a new product, new service, improvement, patent, spin-offs, etc.
- Number of ideas reference by other ideas. In order to identify fundamental-crucial ideas.

- Ideas by person, organization or profile. In order to identify the innovation process driven forces; experts, sponsors and facilitators.

4.3 Drupal Social Web and Real Time Web analysis

Innovation strongly depends on collaboration among different participants. One of the objectives for the overall project is to provide the mechanisms to strengthen collaboration and participation and to measure their impact. Following the methodology layout in previous chapters, the objective for this case study is to develop a platform without such tools, measure the contribution level and compare it with future case studies where those techniques are integrated within the infrastructure.

The objective at this stage of the research project is to investigate on the existent techniques and tools without including them in the case study. Thus, Drupal social Web and real time Web modules have been analysed with the objective to enhance participation. The following modules have been identified as collaboration facilitators; Activity, Activity Stream, Facebook Style Status, Facebook Style MicroPublisher, HeartBeat, Flag, Bowob, Drutalk, Private MSG, APPBAR, Invite, Twitter and Service List. Among other functionality, these modules enable the integration of the platform with Twitter and Facebook, follow the activity from users, place comments with attached files, perform chats, send private message or alerts and import contacts.

Real time web connections and the integration to social web platforms identified in this case study will be implemented in the baseline platform in future work to analyze to what degree these technologies enhance participation and contribute in the idea creation and enrichment stages.

5 Findings

The basic requirements established for this paper have been implemented. Thus a baseline solution to cover the different stages of the idea management process has been deployed. This platform allows the creation, share, analysis, enrichment and selection of ideas.

The platform also provides semantic format for ideas according to GI2MO ontology. This enables machine automatic search, exploitation of semantic meaning to improve ideas content and the possibility to incorporate ideas to the Linked Data.

Drupal social Web and real time Web modules have been analysed with the objective to select those that will enhance participation and collaboration in the innovation process. The resultant list of modules will be employed in future case studies. The results obtained in the new case studies will be compared to the ones obtained in this case study determining which techniques and tools have a bigger impact on the process.

Although the case study is still at an early stage, it can be concluded that user activity is satisfactory and higher than in previous idea contests. Preliminary field results obtained with the conducted case study show that the process responses to the requirements identified in the front-end of the innovation process (idea generation and management) and that the platform provides a powerful collaborative tool that eases administration work and enhances collaboration among participants. The platform provides better knowledge about existent ideas, higher quantity and better quality of ideas.

In addition, a module to personalise the innovation process parameters has been created so the platform can accommodate different types of processes. The module allows the adaptation of the generic platform to different case studies situations and workflow conditions. Thus, the module enables for example the definition of different scopes and the agents involve in each stage (few experts, administrators, enterprise users or many participants), the conditions to pass from one stage to the next (time, number of ideas,…) and the tag dictionary to be used in a specific innovation process.

6 Further work

Following with the previously describe methodology the aim now is to enhance the platform with new functionality and requirements taking into consideration the incremental development cycle approach. The changes introduced with each cycle will be corroborated not only in the case study presented in this paper but over new scenarios. Thus next cases studies will include Mondragon University and the Engineering and Services Division of MONDRAGON (MISE), comprising a total amount of 34 cooperative companies.

The next steps on the project are the following:

- Keep on collecting ideas and measuring the performance of the platform. These measurements will indicate if activity and participation maintains in the long term, whether ideas materialize into new products, services or projects, or old ideas are recovered to complement new proposals.
- Include the modules presented in 4.3 to integrate the solution with social web platforms in real time. It is expected that these tools will boost and encourage participation.
- Exploit the semantic possibilities already available. The advantages expected in this field go from facilitate the search of ideas in many ways or add external content to new proposals, to make easier administration tasks or find unexpected relations among ideas.
- Define new case studies so other organizations and corporations (consultants, enterprises, inter-enterprise collaborations, tourist bureaus, …) will gain from the findings obtained in this project. The platform will be made flexible enough to accommodate and adapt to different scenarios.
- Enhance the platform to contemplate other aspects of the innovation process; technological surveillance, organizational (decision making) or outcome traceability.

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