Introduction of a Wiki in an Enterprise: Motives and Challenges

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Abstract: Among the tools available to implement the collaborative production of knowledge in organizations, the use of wikis has been gaining momentum and showing a low-cost and high efficiency. However, some difficulties still arise when attempting to introduce this kind of technology in an organization. In addition to technological limitations, the cultural issues inherent in companies can also origin problems and promising projects can be abandoned without achieving all the objectives planned. In this work, we study the motives, challenges as well as the more common problems that appear during the wiki implantation process in an organization and the purposed solutions on the literature. The main objective is to identify forms for the wiki to become a tool that everyone can use in the organization and identify the best practices related, so that the project of creating a functional wiki for an organization can aspire to befall a success and not simply abandoned.

Key words: Wiki, social software, Web technology, collaboration tools, corporate knowledge.

1. Introduction

In January 2006, the British magazine The Economist\(^2\) published an analysis entitled "The New Organization", which indicated the main characteristics of organizations that would stand out in the XXI century. According to this analysis, the greatest organizational challenge for the new century would be to increase the efficiency of professionals who produce knowledge. One way of achieving this is to introduce tools that enable collaborative production of knowledge. In fact, organizations which can achieve this level of excellence have a huge competitive advantage in an era where ever more, information is priceless.

Spawned by the success of public wikis as a way to gather information and knowledge, more and more companies are installing corporate wikis to provide their employees with a quick and easy way to collaboratively create and publish information. However, due to the nature of the business itself, corporate wikis comprise more than just articles and discussions. Reference\(^{12}\) report activities range from technical documentation, issues tracking, and reference information in software development to collections of ideas, meeting agendas, and status reports in project management.

Nevertheless, in most cases, corporate wikis are not easily evaluated in terms of other information technology such as enterprise management systems because although they come at little initial cost, they are unstructured to begin with yet self-organizing in the course of action, they will require constant effort to maintain its content\(^{19}\).

Technology solutions might lack of flexibility to support the evolving needs of the group or support the creation of knowledge in various forms but, as noted by\(^5\), this system only works when users are serious about collaborating and willing to follow the conventions and group practices.

In this article we analyze some of the salient features of wikis and the motives that drive companies to introduce it on the enterprise context. The literature review will also help to recognize the items which contribute to a successful implementation and the major constraints that this task can face. We then present the implementation process used in our particular case and finalize with a short conclusion and expectations on future work.

2. Literature Review

Wikis are nothing particularly new to the everyday Internet user anymore. Appearing already in 1995, the first wiki is actively maintained as of today. Reference\(^{11}\) define a wiki as "a freely expandable collection of interlinked Web pages, a hypertext system for storing and modifying information—a database where each page is easily editable by any user within a forms-capable Web browser client."
2.1 Social Software in Enterprise

The range of tools used for collaborative production is commonly called "social software". The concept of social software is derived from the use of Web-based tools that enable collaborative learning while, paradoxically, also allow the individual control over space and time. These technologies permit the participation of a large number of people, on a more democratic and participative form, to allow interaction, debate and create new social relations and networks [14].

The analysis perspective of social software by [3], presents four primary functions:

- Communication – platforms that allow people to talk to other people, whether text, voice, image or video – or a combination of those such as discussion forums, blogs, instant messaging and virtual worlds;
- Cooperation – sharing content in a structured way among several people or not;
- Collaboration – tools that encourage people to collaborate on solving specific problems, either directly or indirectly, where wikis are one example;
- Connection – network technologies that make it possible to establish links with and between content and people. Social networks are the most common example of connection technology.

The capture of the social software spirit made by [13] is perhaps the best one commenting on the effort exerted in all business sectors "to connect employees who have knowledge with those who need it".

In the words of [4], we nowadays live in a culture where the digital has take hold of society and the so called "social" technologies offer unprecedented opportunities for organizations development. The attraction of these social technologies is its low cost, intuitive functionality and connectivity. It provides computing environments that use various applications such as Wikis and other Web-based systems, supporting new forms of network-centric informal interaction activity between people, enabling and improving access to the creation and distribution of information [4]. The Web enhances the social involvement of users offering a collaborative global network where knowledge is shared collectively and decentralized from authority, free to use, edit and publish. However, making use of social networking technologies is not enough, and it is necessary to analyze the organizational culture and its predisposition to cooperation and collaboration [16].

2.2 Corporate Knowledge

Research suggests that the level of social interaction among group members influences positively the quality of knowledge created and identifies two different types of knowledge, namely explicit knowledge and tacit knowledge.

The difference between these two types of knowledge is that explicit knowledge can be easily codified and shared through documents, emails, publications, and others. Tacit knowledge, however, represents the so-called "expertise" or "know how" of a person and is difficult or even impossible to code [14]. Reinforcing this perception, [4], citing Linger & Burstein affirm that knowledge at work is not limited to the practices of self-directed either from individuals or teams which in nearly all industries are wrapped in processes that create and explore knowledge, rather includes a system of activity, "located within the space defined within the dimensions of doing, thinking and communicating."

Most organizations attempt to “manage knowledge” organizing and categorizing large volumes of information designated to be easily retrieved. Research indicates that this can be detrimental since knowledge, by its very nature cannot be controlled in the traditional sense of the word [9]. Furthermore, within a company, knowledge is practically useless if not actually exchanged and used. For this reason, organizational knowledge must be easily transmitted among all employees in order to generate benefits for the business [1], which impels organizations to continually seek new ways to facilitate knowledge sharing within their organizations [15].

Through the implementation of processes for the collection of knowledge, organizations can improve productivity, improve collaboration, encourage innovation, facilitate the flow of knowledge, promote sharing of knowledge, capture and record employee knowledge and improve care Customer [7].

2.3 Wikis in Enterprise Context

Over a decade ago, Gartner, Wall Street Journal and Business Week, identified the wiki as a technology to support collaboration within and between companies [6]. Wiki technology can support the essential requirements for collaborative creation of knowledge in business environments.
One way to share tacit knowledge is through personal communication. If wikis have the underlying ability to connect people, would also have the aptitude to assist the transfer of not only the "explicit" knowledge but also the "tacit".

Despite the fact that all the new technologies might have a transforming influence when taken within an organizational context, the corporate wiki - seeing that it can be developed by knowledge workers through collaboration - is the one of most interest to the field of Knowledge Management [4]. These authors support that knowledge workers who become members of the wiki community in an organization, can obtain advantage of the social interaction of the network structures and creative activity which has become common in digital culture industry, whilst play a more important role in knowledge work organizations.

Reference [11], argues that the major difference between the wiki and other collaboration tools is that it is extremely informal and simple to use. In a corporate environment, the need for updated information increases exponentially and the use of wikis allows professionals register their operational knowledge in a common tool, making the process of recording information more agile and skilled. At the same time, the wiki offers the possibility for users to change their own information, increasing employee involvement with the company, given that it now he also produces information and is responsible for it.

Recognizing that knowledge is constantly evolving, [4] refer that a corporate wiki takes advantage of the human sense making processes that is influenced by attention, motivation, commitment, creativity and innovation of individuals and groups whereas. Reference [14] affirms that distinct to other programs, which have a steep learning curve, the concept of wikis is based on developing the notion that simplicity of use increases the number of users.

The wiki has some distinct characteristics that differentiate it from other collaborative technologies:

- Open content – given that anyone can read and create pages and add or change information on existing pages. It is usually possible to manage access to control whom sees what and what you can do;
- Aggregation mechanisms – comprise a wide range of applications and aggregation of information, ranging from simple lists of tasks, articles, manuals and project reports, positioning itself as a basis for efficient and effective collaboration;
- History – can track all changes made to the contents of a page through the revision history;
- Dynamic structure – a wiki reflects both a network connection records and a network of social relations (i.e., who works with whom). The structure of each of these networks is developed over time, adapting dynamically to the respective objectives of the wiki.

Particularly in organizations, misinformation or lack of information turns out enormous costs. According to [6] a survey by Information Builders GmbH published in 2009 shows that managers point as the main barrier to making good decisions, the inconsistent and incomplete information in organizations. Thus using a wiki in an organization is followed by questions about the quality of information considering that a credible assessment of the quality on the content of the platform enhances confidence in the system of knowledge management and increases user confidence.

Collaboration is an important topic in organizations and, in [17] perspective wikis are tools in transition looking for a place in the world of information collection and management of intellectual property. Wikis have the potential to realize the expected benefits of application solutions for knowledge management [8] and propagate this knowledge in time, distance and the organization itself as they offer a dynamic system for capturing knowledge, able to evolve with changing needs.

### 2.4 Implementation Success Factors

As stated by [3] the successful implementation of the wiki in business requires a considerable change and effective behaviors to replace previous forms of inefficient work.

According to [21] "wikis work better in organizational cultures in which there is a high level of trust and control can be delegated to the users of the system." The author also states that we must begin by defining the needs, considering the issues related to communication, sharing and management. For example, we should think how often people need to communicate, the technology they prefer, how they intend to share information, existing organizational patterns and training requirements [22].

For the use of the wiki to be supported by collaborative groups, the "wiki-way" philosophy has to become part of the group culture [20]. At the same time, organizations ought to realize that the informal network approach which is implicit in a wiki implies not only a loss of control of corporate
knowledge central management, as well as changes in organizational structure and culture [4] that the organization must understand and accept.

According to [18] the reason why many wikis implementations fail, are ignored or slowly wither away, is because they focus on inadequate goals and do not create the necessary environment. To prevent it, the implementations should incorporate several elements, including ease of use, clear identification of the context, call for self-interest and have the management recognition, fitting into the context of both job applications and practices. Reference [18] citing Strauss, Höss, and Weisbecker, presents seven points for successful wiki implementations:

- Make the system open and easy to use – the environment must be accessible, and the content should ideally be a native Web format for ease of connection and alerts;
- Show connections – permit the use of “tag clouds” or other mechanisms to reflect the merging world of connections and content as well as the relationship between different users base on actual usage of the system;
- Connection to e-mail – for the vast majority of users, e-mail remains the primary tool for information exchange;
- Identifying the right context – identifying the business activities that can gain an advantage in an environment of open participation;
- Focus on people – identify target activities, where a large and diverse group of people may be able to make positive contributions, but where it is difficult to involve them in addition to formally identify and train users who are natural collaborators and they can help bring others into the system;
- Provide an initial structure – people need to get some guidance. Give them a purpose and objectives, set the initial content, templates and guidelines is essential;
- Lead by example – managers should actively participate in order to shape the perceptions that users create on the system. It is important that participation is recognized and rewarded.

Several authors refer the importance of top managers in the development of a wiki, adding that leaders must invest time, energy, skill and charisma for the project to succeed [14]. Another study [10] points out that to succeed in implementing a corporate wiki, the company must consider what most often inhibits the knowledge share within the company: extra work, the nature of information and the perception of unfinished product.

3. Implementation

In this section we describe the process applied in our project which is the result of the review done and its application on a real case scenario implemented in the ANO enterprise.

3.1 Method and Decisions

The first step was to determine the requirements and objectives that the company had for the implementation. To achieve it, we organize several meetings with company representatives and visit the company. After this, and because the company had used a wiki before, we conducted a survey about their previous experiences with the aim of identifying the points of either acceptance or the negative aspects of the solution and make the required adjustment to the project.

The survey was answered by 32 individuals, which represents 78% of the company staff. The results of the survey were the following:

<table>
<thead>
<tr>
<th>Tab. 1: Survey to the ANO staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Do you know the functionalities of a Wiki?</td>
</tr>
<tr>
<td>Do you think that the functionality of a wiki can expose people?</td>
</tr>
<tr>
<td>Do you have documents you would like to share in a Wiki?</td>
</tr>
<tr>
<td>Do you consider submit a document in a Wiki for revision process?</td>
</tr>
<tr>
<td>Do you think that a Wiki can be a reliable source of information?</td>
</tr>
<tr>
<td>Do you think that a Wiki can help to improve the communication inside your company?</td>
</tr>
<tr>
<td>Do you think that a corporate Wiki can bring benefits for the staff?</td>
</tr>
</tbody>
</table>
The company also established key functional requirements that should be implemented in the wiki, namely:

- Create a page per product and/or project;
- Search information related to the associated products and projects;
- Store information related with the formation;
- Create documentation related to products and projects;
- Collaborative creation of documents;
- Repository of documentation.

Additionally, the application shall support the following non-functional requirements:

- Usability – the system shall have a simple and intuitive graphical interface. Additionally, it shall import image files, export data in “pdf” format and search for expressions;
- Performance – the edition and search operations shouldn’t get inadequate delays;
- Scalability – the system shall contain a database system to store documents up to 1GB per page;
- Security – allow the safe access to different areas of the Wiki. It also shall allow the creation of user groups and record user logs;
- Costs – the application shouldn’t have associated licensed costs.

Provided with the information gathered, namely the technical requirements and implementation details of the current state of the art concerning the matter, the next step was to select the tool and define the system architecture. This job was done with the help of the site http://www.wikimatrix.org. This site enables comparison on the basis of selection criteria or simply the comparison of different tools. From the final comparison matrix, the selected wiki distribution was the XWiki Enterprise: it meets the largest number of criteria defined for selection requirements, considering that the XWiki is open source, allows the communication to Oracle databases, supports version control, import office documents into wiki syntax through OpenOffice, offers a wide range of plugins and contain an extended programming API.

To the basic version of the installation package available we added a couple of plug-in identified as essential for both acceptances from user point of view and integration with business processes flow: Calendar, Tag Cloud, ToDo’s, Events and Dashboard. An export functionality of wiki spaces in PDF format was also included to respond to the need of documentation creation on the company. Special attention was given to the graphical aspect and looks of the tool as from our survey results this has been identified as an important aspect for the users. These tasks come in line with the recommendations found on the http://www.wikipatterns.com which from our research proves to collect a wide range of good practices in what regards the implementation of wikis in enterprise context.

According to the company organization chart, we have preset the wiki with roles and accesses to the name spaces created reflecting its organization.

### 3.2 Installation and Configuration

The company had pointed out that the solution should be used Oracle database. This requirement was related with both the infrastructure and the human resources that already exist in the company suited to this technology. So the first approach to this process was to request the university's available resources to carry out an implementation of selected wiki and its database. Therefore, we decided to use the Linux Ubuntu system, which is a Linux distribution based in Debian, and we installed the Standalone version “xwikienterprise-installer-generic-3.1-standard.jar”, which brings an associated container – Jetty and the HSQLDB database. As requested by the company, we also needed to install the Oracle database instead of the pre-installed HSQLDB database.
The following steps concerns the configuration of the wiki in order to respond to those identified as good practices as well as implementation requirements identified previously with the company.

To the basic version that provides the installation package we added the plug-in relating to Calendar, Tag Cloud, ToDo's, Events, Dashboard and export of wiki spaces in PDF format. Here are two examples of such applications.

The Event Calendar is designed to provide access to information regarding meetings and conference calls to ANO partners and participating non-members, as well as internally for staff. In addition, information regarding activities by other organizations and government entities may be provided. Documents related to the event may be attached for download or links may be provided.

The ToDos page is very intuitive and simple to use. It is easy to add tasks, set due dates, priorities and other information and then mark tasks as done. It is also possible to set up recurring tasks, such as check project progress every week, and use it to keep track of notes and goals.
4. Conclusions

Both literature and shared impressions of company administrators show that the use of wikis can be very positive and it gives encouraging signs about the potential of this approach to gather, manage and control corporate knowledge in a wide range of aspects. There are multiple offerings that meet enterprise IT standards, and the tools currently available are robust, simple to administer, simple to use, and even free of charge. By putting minimal central control in place an enterprise can gain significant benefit from this simple technology, including improved knowledge capture, reduced time to build complex knowledge-based web sites, and increased collaboration.

In a corporate context, wikis should be used for tasks that involve teamwork, complexity, and deliberation. Properly used, they can free up collaboration and increase employee engagement. There is no doubt that the collaborative production of knowledge can bring competitive advantage to companies, but the research leads to the conclusion that it is not enough to implement the most appropriate tool, the more appealing design and have relevant contents. Beyond the desire of implementation, is indispensable that the company has a cooperative organizational culture in order to have success.

The implementation of a tool for collaborative production is a continuous process that involves education and awareness at all levels of the organization, and constant improvement of the resources offered to the user community. From the academic point of view, as future work to be developed we identify the need, seeing that there are several ways to use a wiki, that it is important to know which are the models that best fit to the business domain, and which models fit which organizations.

5. References

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JOURNAL OF SYSTEMS INTEGRATION 2011/4