Enterprise Microblogging at Siemens, Building Technologies Division: A Descriptive Case Study

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Abstract: Siemens is well known for ambitious efforts in knowledge management, providing a series of innovative tools and applications within the intranet. References@BT is such a web-based application aimed to support globally sharing knowledge, experiences and best-practices within the Building Technologies Division. As a reaction to the demand of employees, a new microblogging service, tightly integrated into References@BT, was implemented in March 2009. In this paper, we comprehensively describe motivation, experiences and advantages for the organization in providing an internal microblogging application. Because of the tight integration, we also outline general facts of the knowledge management application.

Keywords: Microblogging, Enterprise Microblogging, Knowledge Management, Knowledge Transfer, Web 2.0, Enterprise 2.0, Social Media
Categories: M.0, M.6

1 Introduction

Web 2.0 [O’Reilly, 2005] has evolved as the new dynamic user-focused web being equipped with social features by default. It has empowered people to become the main creators of web content by providing a wide range of easily applicable social technology: A plethora of popular Web 2.0 platforms like Wikipedia, YouTube, Facebook, MySpace, Twitter, Flickr, Delicious, etc. was built upon such technology and the principle of user-generated content.

Besides the well-known and ‘ordinary’ weblogs, which are used to express a human voice on the Web [Rosenbloom, 2004], microblogging has become increasingly fascinating especially since early 2008 and was mainly driven by the huge success of the most popular microblogging service Twitter (twitter.com). In the context of blogging, the word ‘micro’ is dedicated to the limited size of such blog posts. Twitter for instance allows broadcasted messages to be no longer than 140 characters.

Microblogging enabled a new form of lightweight communication where users share and broadcast very small chunks of information about themselves, their activities, their thoughts, or anything else being interesting for them. Compared to traditional weblogs, Twitter offers a slightly different functionality. Twitter messages may be public or private (using the ‘DM’ command), can be republished by anybody (with the ‘RT’ command), directed to one or more persons (using the ‘@’ symbol), and dedicated to one or more topics (by providing ‘hash-tags’, the ‘#’ symbol).
Being a relatively new phenomenon, little academic research has been conducted on microblogging in general yet. [Naaman et al, 2010] have explored the characteristics of social activity and patterns of communication by performing an analysis of the content in messages on Twitter. They found out that a majority of users is self-focused while a much smaller set of users is driven by sharing information. [Java et al, 2007] studied the topological and geographical properties of Twitter’s social network. They have identified different types of user intentions and studied the microblogging community structure to learn how and why people use such services. Recently, microblogging has also being investigated on its possible contribution for the educational/scientific domain facilitating mobile learning [Ebner and Schiefner, 2008], improving technology-enhanced learning [Costa et al, 2008], and supporting social networking in scientific conferences [Ebner and Reinhardt, 2009].

The past has shown that Web 2.0 applications and technologies will find their way into enterprises sooner or later. It is worth to mention that microblogging is capable to offer various benefits for individual knowledge workers and their organization when being deployed in the enterprise [Ehrlich and Shami, 2010]. With regard to the Technology Acceptance Model presented by [Davis, 1989], the ‘built in’ simplicity of use will indeed have a positive effect on the users’ acceptance for these new applications. The limited size of microblog postings would keep the individual information overload on a minimum level and might encourage increased participation compared to other applications. Although we feel that there is still a lack on empirical studies about the concrete adoption of microblogging in the enterprise, some research covering the organizational context has already been published. [Günther et al, 2009] have investigated new constructs including privacy concerns, communication benefits, perceptions regarding signal-to-noise-ratio, as well as codification effort for technology acceptance of microblogging systems in the workplace. [Böhringer and Richter, 2009] have provided insights from an early adopter, implementing an own microblogging system under organizational settings and belong to the first researchers to actively discuss the upcoming topic ‘enterprise microblogging’. The case investigated by [Riemer and Richter, 2010] revealed that microblogging in a corporate context can be very different to what is known from Twitter. By applying genre analysis to blogposts, they found out that the communication is much targeted, providing awareness information for colleagues and coordinating team matters [Riemer et al, 2010].

Encouraged by the huge potential for transfer, sharing and acquisition of personal knowledge and experiences, Siemens Building Technologies Division had decided to implement a microblogging service, tightly integrated in its already existing knowledge management application References@BT. This paper explores conceptualization, implementation and utilization of this new service especially discussing the seamless integration of microblogging into the existing knowledge management infrastructure. Thereby microblogging is compared with already existing web-based services within the corporate intranet craving the attention of the knowledge workers.

Our paper is structured as follows: In chapter 2, we discuss the selected research method (i.e. case study research). Chapter 3 covers the Siemens tradition of actively facilitating knowledge management and argues the implementation of the knowledge management infrastructure within the Siemens Building Technologies Division. Chapter 4 outlines the knowledge management application of the Building Technologies Division and discusses the integration of the microblogging service. A detailed
description of the microblogging service can be found in chapter 5. Chapter 6 provides quantitative data on system usage and qualitative data on the system success. Finally, we conclude our paper with chapter 7.

## 2 Research Design

Our paper is dedicated to research in Enterprise 2.0, exploring the new phenomenon ‘enterprise microblogging’. We investigate a currently established microblogging service within one division of a multinational enterprise tightly integrated in its vital knowledge management infrastructure. Our research scope can be defined as follows: We describe the need for a new service within the organization, elaborate on how enterprise microblogging was selected and launched, and show how it has evolved. Thereby we also discuss the role of the responsible manager and explain how this new service has been perceived and accepted among the employees.

We chose case study research as our preferred research strategy, investigating a single case of enterprise microblogging, providing a comprehensive and descriptive single-case study. According to [Yin, 1984], “a case study is an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident”. As we intend to study foremost the surrounding conditions of the phenomenon, we expect to generate very valuable findings when using case study research. We thoroughly studied different sources, including an investigation of artefacts (References@BT application, microblogging service), a survey of several users and a study of quantitative usage data.

A noteworthy limitation of our findings results from our selected research strategy, as single-case studies provide only limited utility for generalization [Yin, 1984].

## 3 A Brief History of Knowledge Management at Siemens

Siemens divides its operations in three sectors: Industry, Energy and Healthcare, with 409,000 employees located all around the globe (as of September 2009). Developed products range from simple electronic controls to fully automated factories; from the invention of the dynamo to the world's most efficient gas turbines; and from the first views inside the body to full-body 3D scans. The three sectors generate an annual turn-over of €35.0 bn., €25.8 bn., and €11.9 bn. in 2009, respectively. The cross-sector businesses count for €4.7 bn. of its revenues [Siemens, 2009].

The company values are responsibility, excellence and innovation. To deliver these values, Siemens spends heavily on R&D: €3.9 bn. in fiscal year 2009. Effective September 2009, Siemens had 31,800 R&D employees, 176 R&D locations in over 30 countries, and more than 56,000 active patents.

Siemens is one of the pioneers in exploiting knowledge management (KM) systems. Since the early 1990s, it has responded to deregulation and technology development with a bold way of culture shift towards the development of IT-based (and since 1999 web-based) KM systems [Müller et al, 2004]. In the last 15 years, KM in Siemens has experienced various stages of development, from transferring content (explicit knowledge) to transferring capability (tacit knowledge), as well as acting as
social networking mechanism. This process does not only include the deployment and the provision of KM applications. It also needs the creation of a new way of collaboration – away from the paradigm \textit{"knowledge is power"} towards a culture of trust and support across geographical, organizational, and hierarchical borders.

The Building Technologies (BT) division is the entity for the former Siemens Building Technologies (SBT) group since January 1st, 2008. SBT was founded on October 1st, 1998 as a result of integrating the former \textit{Elektrowatt} group's industrial sector units into the building technologies activities of \textit{Siemens}. Thus, the competencies of the former companies \textit{Cerberus, Landis & Staefa} and \textit{Siemens} were consolidated into one organization. Today, the BT division is headquartered in Zug, Switzerland, and consists of five business units: Building Automation (BAU), Control Products and Systems (CPS), Fire Safety and Security Products (FS), Low Voltage Distribution (LV), and Security Solutions (SES). In September 2009, BT’s workforce counted more than 36,000 employees located in many countries around the globe.

Each business unit operates in a highly competitive market environment and sells products, systems, customized solutions and services by a decentralized organization. Because the BT division has been significantly challenged on price by its competitors, several strategic initiatives have been defined and implemented to reach the Siemens business targets. Concerning the growth of sales and profitability, one of the focus areas was to enable the global sales force to learn from successfully implemented projects and solutions. To facilitate this knowledge transfer, the SES management decided to develop a web-based intranet application, which contains solution concepts in order to replicate or re-use them.

4 References@BT – an Overview

Since 2005, References@BT is available as web-based knowledge management platform. As explained above, it was initially planned and developed only for being used within SES, i.e. on business unit level, only. Due to requirements and positive feedbacks coming from other business units, the application’s target group was extended from a single business unit towards the whole division within the first year of operation. At a glance, References@BT ...

\begin{itemize}
  \item is a web platform for the global exchange of business-related knowledge, experiences and best-practices,
  \item is a social networking tool, which networks colleagues and animates them to communicate to each other,
  \item is intended for company-internal use and thus only available within the Siemens intranet,
  \item considers its users as global community (currently approx. 6,800 members located in 72 countries) supporting each other.
\end{itemize}

Since the early beginning, References@BT was not planned and designed for capturing the complete ‘company knowledge’ and thus becoming an ‘omniscient’ tool [Müller, 2007a]. Moreover References@BT aims to network colleagues across geographical, hierarchical, and organizational borders and animates them to communicate to each other [Müller, 2007b]. Bringing the two parties – one is urgently needing and
the other is being able to provide the same piece of knowledge – promptly together is one of the main purposes of References@BT. Therefore it is not essential to provide fully documented contributions released by a central editorial team. Even if the contributions are not coordinated and harmonized and might lack a perfect grammatical style, it is sometimes more important to provide 80% of a certain information immediately than to have 100% of the information several days or weeks later.

References@BT supports all project phases according to the project management process at Siemens BT, i.e. finding reference projects, replicable solutions, similar solutions, experts and services opportunities. It received multifaceted input from project managers, i.e. success stories, information on ongoing projects, finalized projects and services business. In combination with MS SharePoint, References@BT is being integrated in the development process for solution packages allowing international teams easily work together across continents and time zones [Müller et al, 2009].

Besides several features for subscription and social networking (e.g. following each other, providing personal information), References@BT allows its users to publish own contributions and make them quickly and globally available for all colleagues. The usability of Reference@BT is simple and intuitive being a result of many users’ requirements by consequent implementation of received user feedbacks.

In References@BT, three different content types allow a user-friendly contribution of knowledge and experiences adapted to the current situation and to the kind and amount of information:

- **Knowledge References** (available since March 2005) are structured information objects containing several data fields of different types. Knowledge references are used for covering customer projects, solution/service concepts, business excellence cases, or ‘Lessons Learned’. A set of metadata, which are independent of each other (e.g. discipline, vertical market, country, year of completion, etc.), allow multi-dimensional search queries, e.g.: a list of all “customer projects with access control, executed in financial institutions in Austria and completed in 2006 or later”. All possible search queries can be subscribed via e-mail or RSS feeds. Furthermore, any reader can post a so-called ‘feedback’ to a knowledge reference, which will be immediately displayed below the contribution. A feedback consists of an attribute (the type of feedback), a textual comment and an optional rating displayed with 0 to 5 stars. The respective average rating is displayed at the top of each knowledge reference and within any search result list.

- **Forum Postings** (available since March 2006) are contributions, which are grouped in a topic-oriented way within discussion forums or blackboards. References@BT offers several of such forums for defined technological or functional topics. It is possible to subscribe postings contributed to certain forums via e-mail or RSS feed. Within the special ‘Urgent Requests’ forum, all users have the opportunity to ask any kind of business-related question. Any new community member has a notification alert automatically set to this special discussion forum.

- **Microblog Postings** (available since March 2009) are short and person-oriented contributions, which are displayed in chronologically reverse order. This content type was especially implemented to stimulate the participation
of the community, as these postings are small in size and thus capable to limit the information overload when discussing project-oriented topics. A detailed description of this content type is given in the following chapter 5.

Ideally, the users of References@BT should be motivated intrinsically. This happens by receiving immediate benefit out of the contribution, by an easy and fun-providing usability, by certain social networking features, etc. To quickly increase the amount of contributions, rewards are given out to a competition within a limited observation period (e.g. four months). During this period, users can collect points, so-called ‘Ref-Coins’, for adding certain contributions, such as responding to urgent requests, responding to discussion groups, writing blog postings, and publishing new knowledge references. The top 10-15 users with the highest ‘RefCoins’ balance are rewarded. The award includes material prizes as well as non-financial measures such as certificates and nominations in company-internal media.

Currently the users participate in References@BT on a purely voluntary basis. To strengthen the knowledge sharing culture, active participation in KM systems and communities could be an integral part of working processes, business target agreements and/or HR-based staff incentive systems in the future.

5 A Detailed Description of the References@BT Microblog

Prior to the implementation of the References@BT Microblog, the following phenomenon was observed: Since end of 2008, several hundred Siemens employees joined a community on Yammer (yammer.com), which provides corporate microblogs in the internet and allows closed user groups according to the members’ e-mail domains. This effort showed that there was and still is a strong need for having a microblogging solution for the staff. To avoid publishing and discussing internal content on an externally hosted site, the development of an own microblogging application within the company’s firewall was treated – not only from the perspective of IT security – with high priority.

The References@BT Microblog differs from other well-known microblogging services in various aspects:

- In contrast to Twitter, but similar to Yammer, microblog postings in References@BT aren’t restricted to 140 characters.
- As it is in Yammer, References@BT allows direct replies to any microblog posting and to display the resulting hierarchical structure of nested replies as a so-called ‘topic’, see following figure 1.
- Every initial microblog posting must be mandatorily provided with one or several tags, which (according to a so-called ‘folksonomy’) aren’t predefined and can be arbitrarily chosen. This applies as an option for replies. Since the References@BT Microblog is not limited to any pre-defined conversation topics, these tags allow filtering the whole microblog for similar content by simply clicking on any tag.
- Mentioning other colleagues is possible, but due to a different data format a summarized view of all those mentions (as in Twitter) is not supported.
By selective ‘following’ of certain colleagues and/or selecting certain tags only, the postings can be easily classified and filtered according to relevant and interesting content by any user. Any selection can be subscribed by e-mail or RSS feed ensuring that only relevant information reaches interested readers.

At the beginning, there have been some fears about negative or useless postings and about intentional abuse, due to the fact that every user (i.e. every Siemens employee with intranet access) is able to write and publish own content. Since anonymous contributions are not possible in References@BT and all contributions clearly show the full name and location of the author, there wasn’t any intentional abuse since References@BT came into being.

Though the microblogging service was tightly integrated into the knowledge management application, a series of actions were taken to raise the awareness amongst the employees. We briefly describe them in the following:

- Soon after implementation of the new microblog section, all registered community members in References@BT have been informed about this new feature and were asked to write own microblog postings. As additional measures
for promoting the microblog, it was offered to place textual comments during a user survey (which resulted in about 150 postings) and to write and share individual Season’s Greetings shortly before Christmas (which resulted in about 80 postings).

- Certain postings filtered according to defined tags are dynamically displayed on usual intranet pages, e.g. the latest blog postings related to fire safety are shown on the intranet homepage of the FS business unit. This significantly helps to spread the idea of providing user-generated content and to motivate the intranet users to write own postings spontaneously.

- References@BT allows the import of postings owning a certain hashtag from several microblogging providers (Twitter, Yammer, Socialcast). This has also helped to significantly increase the content quantity without the need of double posting for the contributors.

- One of the success factors is the tight identification of some participants, an identity management feature well known from social networking services [Koch and Richter, 2008]. Displaying the author’s image adds a very personal touch to each posting.

- Like in Twitter and Yammer, References@BT allows to ‘follow’ other community members, too. Microblog postings of all those colleagues, whom anybody is following, are summarized and sent as e-mail to the follower once a day. A special RSS feed, which contains these postings, is provided as well.

The majority of the References@BT Microblog postings are related to the BT business and to the necessary information around. Many postings contain useful hints, interesting news or web pages, information around fairs or conferences, etc. There are several postings discussing issues around knowledge management and Web 2.0 within Siemens. Postings with pure private content are only rarely posted.

6 System Usage and System Success

Besides providing information on References@BT from the perspective of the manager responsible for operation and development of this application, we provide further sources of evidence on system usage (quantitative data) and system success (qualitative data).

![Figure 2: Usage statistics of the References@BT Microblog](image-url)
Figure 2 presents user statistics, providing insights into the usage of the References@BT microblogging service. The number of new postings has two peaks in September and December 2009. This is a result from the introduction measures described in the previous chapter 5. The fact that the number of new postings remains at a significantly higher level after the first measure in September 2009 can be interpreted as a success.

To learn more qualitative success factors, we surveyed eight frequent users of the References@BT Microblog on success-relevant aspects derived from the Technology Acceptance Model [Davis, 1989] and the Information System Success Model [Delone and McLean, 1992]. The usage of these two popular models enabled us to quickly identify the core aspects for our research: perceived usefulness, ease of use, individual benefits and organizational benefits.

In the following, we present results on employee’s perceived usefulness, perceived ease of use, and perceived individual and organizational benefits, asking four questions:

- What are the three main reasons why you use the new microblogging tool in daily business? (perceived usefulness)
- What do you particular like when using the tool, what may be improved? (perceived ease of use)
- What are your three main benefits gained from using this tool for your work? (perceived individual benefits)
- What do you think is the main benefit for an organization when owning such a microblogging tool? (perceived organizational benefits)

**Perceived usefulness** dealt with the easy way of sharing information (5 statements), the additional channel of promoting events (2 statements), new means of networking with others (2 statements), a suitable tool to improve writing skills (2 statements), a possibility to follow experts (1 statement), a way of identifying current trends (1 statement), and the new awareness of latest happenings (1 statement). The following three statements present perceived usefulness:

- "The microblogging tool helps to understand or be aware of the latest happenings in terms of product releases, features, market enhancements, etc. in the BT division. For an employee working in the Industry Sector, it is very much necessary to network with other fellow employees working in other sectors, too. It is also important for them to understand the ongoing changes, projects delivered, business challenges, etc. in other sectors. This will help to benefit in terms of knowledge, understand some of the best practices used in BT, and to network with others."
- “For a technical communicator/technical writer, it is very important to keep in contact with other groups/sectors working in the documentation business and to very well know about the standards/quality procedures used in other sectors. This would help leverage and improve their documentation standards, document quality, document processes, etc. by keeping in line with what is happening across other teams globally. Blog postings on this tool help to bring teams working in a global environment closer together.”
- “Blogging, of course helps in terms of improvement towards writing skills. It helps me to keep my writing skills up-to-date. Taking a topic and sharing...
views/comments about them definitely leads to gathering collective information. This information collected can further be re-used in the form of best practice or methodology that can be implemented in their respective teams.”

**Perceived ease of use** dealt with technological aspects which employees like, including grouping of blogs with certain tags, the possibility of adding HTML links to blog posts, the possibility of importing blog posts from externally hosted microblogging services, the possibility of forwarding blog topics or profile pages easing networking in general. However, employees also mentioned possible technical improvements as the following statement outlines:

- “We need to look at Web 2.0 aspects and try to improve this tool to be inclined towards Web 2.0 standards. Since the number of blog entries is increasing, it is good to group all the blogs to their respective blog group name.”

**Perceived individual benefits** dealt with the assistance of getting the right contacts (5 statements), the assistance of getting the right information (2 statements) and expert knowledge (2 statements), enlarging the personal network (1 statement), learning from followers (1 statement), and gaining an edge on information (1 statement). The following three statements present interesting insights into perceived individual benefits:

- “One of the major benefits was with respect to information regarding BACnet. As our platform was using this protocol, the microblogging tool helped me in getting the right contacts working on this protocol and to receive more information about this protocol that helped me with my documentation work.”
- “I found materials (documents, links) and people I would not have come across as easily through web search or other means of communication.”
- “From the work point of view, this tool has helped me to get information regarding the documentation standards, processes, quality procedures, editing standards used by other teams globally.”

**Perceived organizational benefits** dealt with the better flow of information caused by the microblogging service (4 statements), the enabling of worldwide networking (4 statements), the caused drive on knowledge management practices and learning (1 statement), reducing overall workload (1 statement), and the diffusion of rich experiences which lead to more innovative thinking and better products (1 statement). The following two statements present interesting insights into perceived organizational benefits:

- “Finding other people in the organization that might have the skills or knowledge you require for a particular problem is often very hard. Microblogging provides the ability to find and exchange knowledge with other people in the organization and thus enables very quickly best-practice sharing and avoids ‘reinventing the wheel’. It also reduces the workload compared to e-mail communication, since I as a user can search the activities that seem worthwhile engaging in instead of sifting through stuff pushed at me, which requires time to scan and judge regarding its usefulness.”
“This tool will help the organization to drive knowledge management practices, key learning activities and enable networking with teams worldwide. The rich amount of experience possessed by each of the employees should be driven towards innovative thinking. Knowledge sharing activities within the organization help each other and also help the organization to benefit, e.g. while developing new products and solutions. There needs to be a central repository to track such knowledge activities, research activities, and innovations happening within the organization. This tool will help to share these activities leading towards an effective information management approach.”

7 Conclusions and Future Work

Our case study revealed that the new References@BT Microblog was well accepted from the user community right from the beginning. Providing the possibility to publish own content both easily and – what’s sometimes very important in daily business – quickly is an important success factor. For an organization, a frequently used microblog offers the benefit of faster knowledge exchange and better networking of the employees. Furthermore, internal Web 2.0 applications avoid the shift towards external platforms hosted by internet providers.

As more people, so-called ‘digital natives’, who are familiar with Social Media, will move into companies, the challenge “how to generally motivate the staff to participate in Web 2.0” will step-by-step move towards “how to provide Web 2.0 tools, which support our business processes in an optimal way”.

Future research will cover the perspective of microblog deniers. We intend to learn from them about perceived obstacles for using the microblog. Gathering their knowledge and motivation will enable us to continuously improve References@BT.

References


