

# Exploring Factual and Perceived Use and Benefits of a Web 2.0-based Knowledge Management Application: The Siemens Case References+

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## ABSTRACT

References+ is a business-related Web 2.0-based application designed to facilitate the worldwide sharing of knowledge, experiences, and best practices on the Siemens intranet. The underlying knowledge management approach has a strong focus on the user community, which currently comprises approximately 10,000 registered members located in more than 75 countries. To measure the individually perceived benefits generated by References+, a user survey was performed in 2011. This paper not only evaluates the survey results received from nearly 1,500 respondents, but also detects and discusses any correlations to factual use and contribution behavior measured by an evaluation of the respondents' system usage statistics. This allows a first attempt to explore the potential of a combination of perceived use and benefits (as measured by the user survey) with factual use (as measured by the corresponding usage statistics). As an important finding of this research, it was observed that higher perceived benefits correlate with usage frequency and the number of viewed contributions. The correlation is less strong regarding average contribution activity and for some cases ambiguous regarding the number of followers. Furthermore, it can be reported that in general a higher perceived use is also reflected in a higher factual use and in a higher number of followers.

## Categories and Subject Descriptors

H.4.2 [Information Systems]: Applications – *Miscellaneous*.

## General Terms

Management, Measurement, Documentation, Human Factors.

## Keywords

Knowledge Management, Enterprise 2.0, Web 2.0, Social Business, Social Collaboration, Social Intranet.

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*i-Know '13, September 04 - 06 2013, Graz, Austria Copyright 2013 ACM 978-1-4503-2300-0/13/09...\$15.00.*

<http://dx.doi.org/10.1145/2494188.2494204>

## 1. INTRODUCTION

### 1.1 Web 2.0 and Enterprise 2.0

Web 2.0 as coined by Tim O'Reilly [22] has revolutionized how people share information and knowledge on the Web. Applications such as Wikipedia, Facebook, YouTube, Twitter, and LinkedIn have been very successful in forming participative environments where anybody can freely create, share and modify content in an easy and intuitive way. Web 2.0 has virtually empowered users to become creators of content by applying a wide range of social software. As a result, user-generated content has become a valuable source to facilitate all kinds of decisions.

Driven by the huge success of Web 2.0 and social software as well as motivated by their observation of user interaction on the Web, enterprises began to launch their own initiatives centered on Web 2.0 principles and technologies. The adoption of Web 2.0 was supposed to lead to business advantages for various domains. So far, the majority of corporate Web 2.0 projects has focused on external online marketing (e.g. establishing company profiles on Facebook), but some enterprises have already gained notable experience using Web 2.0 platforms within their intranets.

Early adopting enterprises started to implement Wikis [1] [32], Weblogs [10] [14], Social Networking Services [27] [28], Microblogging [20] [33] [34], and media/content sharing platforms. These corporate artifacts are usually built upon the principle of every employee becoming not only a consumer but also a producer of content (in analogy to user-generated content). Similar to the Web 2.0 phenomenon, employee-generated content spreads quickly in corporate intranets. This intranet evolution is referred to by a variety of terms ranging from "Enterprise 2.0" [17] to "social business" [12] [13]. The basic idea behind these terms is to increase openness and transparency of information and knowledge by adopting social software. Recently, such initiatives have also been aligned with a series of broader concepts including "networked enterprise" [3] [30] or "future workplace" [8].

### 1.2 Web 2.0 and Knowledge Management

Web 2.0 platforms have steadily lowered the barrier of knowledge sharing on the Web and provide rich sources for knowledge acquisition. Their new modes of use have attracted knowledge managers in enterprises who intend to implement Web 2.0 principles and applications to facilitate "sharing" in a comparable way.

However, to fully exploit the huge potential of Web 2.0 for knowledge management, managers need to understand and master the emerging field of tension between the self-organization of its users as a fundamental principle of Web 2.0 and the prevailing hierarchical organizational structures in enterprises.

The increasing convergence of Web 2.0 and organizational knowledge management has been studied by scientists in the past: Levy [15] argued that Web 2.0 shares numerous principles and attributes with knowledge management although certain differences do exist. Other publications discussed the potential of Web 2.0 to empower knowledge workers [31] and investigated key determinants of knowledge sharing and collaboration enabled by Web 2.0 technologies [23]. Insights into the ability of Web 2.0 to harness and manage personal knowledge are provided by Razmerita et al. [25]; they question whether Web 2.0 can reconcile conflicting interests of managing organizational knowledge with personal objectives. Richter et al. [29] studied and analyzed social software adoption in 23 companies and derived six main goals of corporate social software adoption. These findings were compared with the goals of knowledge management, as identified from a series of well-known knowledge management studies [4] [9] [24]. While some goals of introducing corporate social software including improvement of knowledge transfer and communication have already been known to KM researchers, others, such as facilitating user participation along the value chain or fostering employee-to-employee communication, are rather new.

### 1.3 Measuring the benefits of Web 2.0-based Knowledge Management

As enterprises increasingly need to justify their investments in information systems, they often have to assess the benefits of Web 2.0-type knowledge sharing platforms. Information system (IS) researchers have introduced conceptual models based on the popular DeLone and McLean IS Success Model [6] [7] and adapted them for assessing social software in the enterprise [26]. DeLone and McLean propose concepts including information quality, system quality, service quality, usage, benefit for the individual and benefit for the organization to conceptualize and operationalize IS success. As another important contribution, Davis [5] introduced the concepts “perceived usefulness” and “perceived ease of use” which are crucial to assessing how and why new information systems are adopted by employees. Both the information systems success model and the technology acceptance model were used in many studies and have been continuously refined.

Usually, the benefits of Web 2.0-based knowledge management applications have to be evaluated in the same way. Based on the models described above, a variety of instruments is used in practice: Key user interviews, user surveys, and usage statistic evaluation are very popular. Calculating a return on investment (ROI) for Web 2.0-based knowledge management (and knowledge management in general) has become a hot topic. In some cases, managers request calculations to evaluate if investments have paid for themselves (i.e. generated the budgeted return). However, measuring the success of knowledge management is a very complex topic. Some practitioners even refer to the calculation of ROI as “business case tuning” when platforms aimed at facilitating knowledge sharing have to provide a value to be measured in monetary terms.

Many studies involve interesting cases to learn about Web 2.0-based knowledge management and its benefits [1] [10] [14] [20] [27] [28] [32] [33] [34]. Because Siemens is well known for its ambitious efforts in knowledge management, the development of Web 2.0-based platforms for knowledge sharing and social networking has a long history there. Evaluating the benefits of the References+ platform is an important issue for both Divisional Management and the Senior Manager Knowledge Management responsible for References+ (who is a co-author of this paper). For this purpose, he regularly evaluates usage statistics and conducts user surveys in addition to performing key user interviews. Since he periodically reports to management about the benefits of the platform, he experimented with online surveys to make qualitative effects visible and (in terms of ROI) understandable in monetary terms.

This paper outlines the results of a 2011 online survey to which 1,479 users of References+ responded. It also presents the results of an analysis of usage data for all those survey participants. As a key point of this paper, survey results are linked to corresponding usage data to allow a comparison of both data sets. This was feasible because the online survey used References+ as the underlying application. By linking perceived use and benefits (measured by the survey results) with factual use (measured by usage statistic analysis) this paper aims to answer the following central research question: “How do the survey results on the perceived use and benefits of a Web 2.0-based knowledge management platform match the factual use of that platform?” Exploring this question is a crucial point as most investigations of use and benefits (and ROI calculations) are based on either surveys or an evaluation of usage data, but do not combine both.

Against this background, this paper is structured as follows:

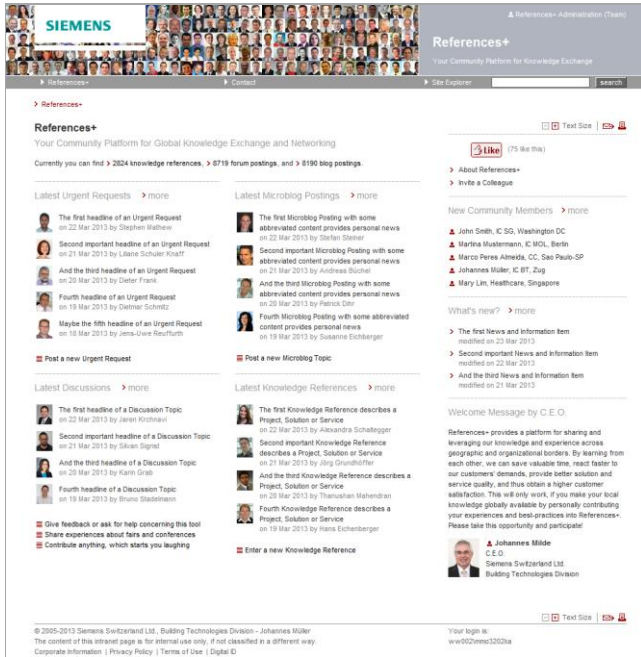
- Section 1 provided an introduction of the key concepts of Web 2.0, Web 2.0-based knowledge management applications and the challenges of measuring the use and benefits of such platforms.
- In section 2, the paper continues with an outline of the Web 2.0-based knowledge management application References+, giving an overview of its history at Siemens, its functionalities and prior evaluations.
- Section 3 is dedicated to the research design and introduces the underlying research data and the chosen research approach.
- Section 4 presents the results of the online survey, compiles the results of the usage statistics analysis, and links both results to elaborate on the presented research question.
- Section 5 continues with a discussion of the research results and the limitations of the selected approach and refers to matters of generalization. Furthermore, a conclusion and an outlook to future research is given.

## 2. REFERENCES+

References+ (previously named References@BT until February 2012) is a well-known case of a Web 2.0-based knowledge management application in the scientific community [19] [20] [21].

The primary goal of References+ is to make the core business knowledge – and the corresponding experts – available within the

company more quickly. From the outset, no attempt was made to provide a knowledge base that is “complete” in terms of scope and content. Instead, References+ is more of a social networking tool designed to connect employees across organizational, hierarchical, and geographic boundaries and to stimulate direct communication. The use of References+ is entirely voluntary; currently there are no business processes that force employees to use it.



**Figure 1. References+ homepage (with the new Siemens web layout introduced in March 2013)**

The key components of the knowledge management platform include comprehensive functions to search posts by full-text queries and metadata, to subscribe to new or modified contributions via e-mail notifications and RSS feeds, as well as social networking features such as “following” other community members. The platform’s structured content includes Knowledge References, discussion forums, microblog postings, and profile pages as described below.

**Knowledge References** are structured information objects containing multiple text, number, and metadata fields. Among other things, they describe customer projects, product and solution modules, services, internal process improvements, and “Lessons Learned.” Similar to customer reviews on the internet, each user can post feedback about a Knowledge Reference that is visible to all other readers. This feedback contains an optional rating on a scale of 0 to 5 (indicated by the number of stars) in addition to a textual comment. This allows the community to comment on and rate the quality of the contributions.

**Discussion forums** allow users to exchange information asynchronously about technological or functional topics. For example, in the very popular Urgent Requests forum they can ask business-related questions about products, technologies, compatibilities, customers, contacts, etc. Due to their high priority, Urgent Requests from References+ can also be displayed in other company-internal community platforms such as TechnoWeb [18] and Community4Competence [2], with users being able to specify on

an individual basis if their requests should be forwarded or not. This increases the potential audience of such requests and the probability of receiving useful answers. These other systems use an RSS feed provided by References+ to import the relevant content.

**Microblogging** is similar to Twitter, Yammer, Socialcast, Chatter, or comparable tools. It supports open communication and social networking about topics relevant to the core business. An in-depth evaluation of this microblogging service can be found in the article “Enterprise Microblogging for Advanced Knowledge Sharing: The References@BT Case Study” [20].

**Member Pages** can be customized by community members as desired. A Member Page is essentially similar to a profile page on other social networking platforms (such as LinkedIn). It displays the user’s name, organization, place of work, phone numbers, e-mail address, an optional “About Me” text field, and an optional photo. Most user data is synchronized regularly with the Siemens employee directory, eliminating the need for manual updates. If desired, the “About Me” field can be used to enter personal information relevant for the business, such as title, field of work, and expertise. In addition, the user’s presence status from Microsoft Communicator (an instant messaging service used by Siemens) is shown as a colored sphere.

### 3. RESEARCH DESIGN

Our research problem can be defined as follows: Measuring the benefits of Web 2.0-based knowledge management platforms plays a major role because managers increasingly need to justify their investments in information technology and human resources. In practice, either online surveys or usage data are used as sources for benefit evaluation. To the best of the knowledge of both authors, this paper is the first to attempt combining both instruments by matching the user survey replies with the corresponding usage data.

Usage statistics give insights into hard facts but do not report on generated or perceived benefits. Assessing the benefits of the platform is largely a matter of interpretation if only usage statistics are taken into account. The assumption is that a higher factual usage frequency as reported by the statistics will go hand in hand with a higher organizational benefit. On the other hand, user surveys may in fact reveal benefits but can only report on soft facts, i.e. how a benefit is subjectively perceived according to specific platform appropriation. However, this benefit is only an accumulation of perceived individual benefits. Even if survey respondents perceive an individual benefit, they may be biased as there is naturally no rigorous quantification.

The selected approach combines both instruments and therefore allows exploring a series of research questions derived from the central question:

How do the survey results on perceived use and benefits of a Web 2.0-based knowledge management platform match the factual use of that platform?

This research question is driven by the fact that calculating a return on investment is facilitated in practice by surveys (since they allow referring to specific types of benefits, for instance). But do the reported perceived use and benefits really match the factual use? Elaborating on this aspect is the central point of this paper. If this were not the case, surveys would be very ineffective in report-

ing on the use and benefit. To sum up, the authors focused on three key concepts:

- (1) Perceived use (as measured by the survey),
- (2) Perceived benefits (as measured by the survey), and
- (3) Factual use (as measured by usage statistics).

**Table 1. Online Survey Questions**

Survey Questions
Which organizational unit are you working for? (list of selected Siemens units)
How often do you use References+? <ul style="list-style-type: none"> <li>• almost daily</li> <li>• min. one time weekly</li> <li>• min. one time monthly</li> <li>• less than monthly</li> </ul>
How helpful is References+ in your daily work? <ul style="list-style-type: none"> <li>• very helpful</li> <li>• predominantly helpful</li> <li>• partially helpful</li> <li>• not helpful</li> </ul>
How much working time did you save (in the last 365 days) by using information found in References+? <ul style="list-style-type: none"> <li>• several days saved</li> <li>• one day saved</li> <li>• one or several hours saved</li> <li>• no time savings</li> </ul>
How much money did you save (in the last 365 days) by using information found in References+? <ul style="list-style-type: none"> <li>• more than €10,000 saved</li> <li>• €1,000 ... €10,000 saved</li> <li>• €0 ... €1,000 saved</li> <li>• no money savings</li> </ul>
How much additional business turnover did you generate (in the last 365 days) by using information found in References+? <ul style="list-style-type: none"> <li>• more than €1 million in additional turnover</li> <li>• €100,000 ... €1 million in additional turnover</li> <li>• €10,000 ... €100,000 in additional turnover</li> <li>• €0 ... €10,000 in additional turnover</li> <li>• no additional turnover</li> <li>• I cannot directly influence turnover</li> </ul>
How many additional customers did you attract (in the last 365 days) by using information found in References+? <ul style="list-style-type: none"> <li>• 3 or more additional customers</li> <li>• 2 additional customers</li> <li>• 1 additional customer</li> <li>• no additional customers</li> <li>• I don't have direct contact with customers</li> </ul>
What is your overall rating for References+ and the related administration team? <ul style="list-style-type: none"> <li>• very good</li> <li>• good</li> <li>• average</li> <li>• insufficient</li> <li>• I don't want to give a rating.</li> </ul>
Feel free to share any comment related to References+ (optional, min. 15 characters).

The authors were not able to measure factual benefits (as a fourth concept) because there is no mechanism known to them to achieve this.

Basically, the authors explored two data sets to answer their research question: The first data set was generated from an online survey which took place in August/September 2011 and to which 1,479 References+ users responded. As the co-authoring manager aimed to explore and quantify the ROI of platform usage, the survey included questions on working time saved, additional revenue generated, and additional customers attracted by using information shared in References+ (as shown in table 1).

Since this online survey used References+ as the underlying technology, the *user\_id* of each survey respondent is known. This enables the authors to link any particular survey answer with the respective factual usage data. The second data set used by the authors is therefore a compilation of usage data. The time span from which the user statistics were extracted ranged from 18 months before the survey date (April 2010) to the end date of the survey (September 2011). Table 2 below presents the attributes which were used to link survey results to usage data.

**Table 2. Available usage data**

Present status of user and user account (March 2013)	
Office location (city, country)	Organizational unit
Registration date	Date of last visit
Account active/inactive	Photo uploaded (true/false)
# characters in "About me" field	# of other internal Social Media platforms [11][16][18]
Usage data (April 2010 – September 2011)	
# of days with access to References+	# of visited Knowledge References
# of contributions	# of followers and following

The data from the survey is used to establish groups of respondents (according to the answer types). For all these groups, the total and average values of data from the usage statistics analysis are calculated to allow comparison.

## 4. RESULTS

### 4.1 Results of user survey

In total, 1,479 persons participated in the user survey (see table 1) between August 26<sup>th</sup> and October 10<sup>th</sup>, 2011, with the vast majority responding before September 22<sup>nd</sup>, 2011.

The most respondents are located in Germany (340), Switzerland (301), United States (131), Austria (63), India (48), Netherlands (44), Canada (39), China (39), United Kingdom (39), Italy (31), and Belgium (31). The self-evaluations regarding the perceived References+ usage frequency range from almost daily (140), min. one time weekly (341), min. one time monthly (371) to less than monthly (627).

The following screenshot depicts the survey results by displaying the number of respondents for every provided option.

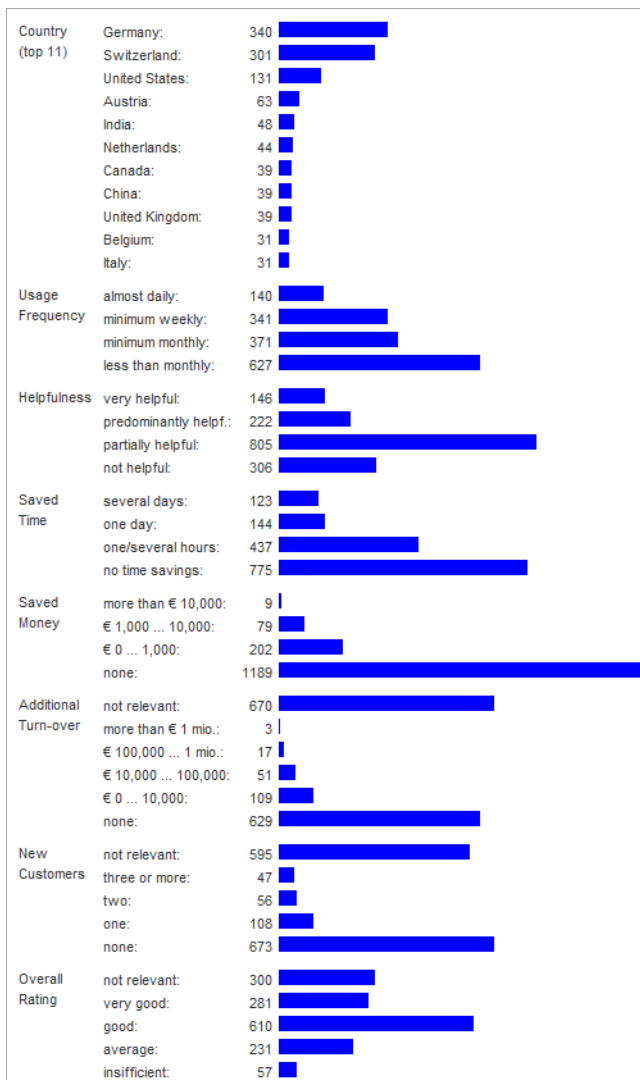


Figure 2. Results of the 2011 user survey

## 4.2 Results of usage data analysis

The following tables show some selected activity correlations on usage frequency, user's country and activity in other Siemens-internal Social Media platforms:

- “# respondents”: Number of respondents for a given criterion.
- “Ø activity days”: Average number of days with access to References+.
- “Ø visited KR’s”: Average number of page views of Knowledge References.
- “Ø contributions”: Average accumulated number of contributed Knowledge References, feedbacks, forum postings, and microblog postings.
- “Ø followers”: Average number of followers.

The activity figures are limited to the survey respondents and to the period from April 1<sup>st</sup>, 2010 to September 30<sup>th</sup>, 2011. During this period, the usage data of the 1,479 respondents reflected 29,466 activity days in References+, 13,806 visited Knowledge References, 2,548 total contributions, and 1,828 followers.

Table 3. Usage data dependent on factual usage frequency

	100+ days	50-99 days	16-49 days	0-15 days
# respondents	56	95	334	994
Ø activity days	136.9	69.1	26.9	6.3
Ø visited KR’s	38.2	44.6	16.0	2.1
Ø contributions	11.1	6.2	2.0	0.4
Ø followers	4.5	4.2	1.5	0.7

Table 4. Usage data for selected countries

	de	ch	cn	us	br	in
# respondents	340	301	39	131	13	48
Ø activity days	14.9	26.7	7.5	7.2	12.1	18.8
Ø visited KR’s	6.3	16.5	5.2	1.4	5.4	7.9
Ø contributions	1.1	2.9	0.3	0.8	0.8	1.8
Ø followers	1.2	2.2	0.8	0.3	4.9	1.1

Table 5. Usage data dependent on membership number in other company-internal Social Media communities

	3 more commu.	2 more commu.	1 more commu.	no other commu.
# respondents	18	50	259	1152
Ø activity days	32.8	38.8	25.7	17.6
Ø visited KR’s	2.1	17.6	13.2	8.2
Ø contributions	10.4	8.8	1.5	1.1
Ø followers	4.1	3.5	1.3	1.1

The preceding tables demonstrate that frequent users and users who are also registered in other company-internal Social Media platforms usually have more “followers” and posted more contributions. However, reading activity does not always increase with growing usage frequency or a growing number of Social Media platforms where users are also registered. Due to the low number of respondents from certain countries, no intercultural implications can be derived from the usage data.

## 4.3 Correlating survey results and usage data

In this section, perceived usage is compared with different types of factual usage. Due to space restrictions, the following section can only present a snapshot of the calculations.

The following table shows that respondents with a high perceived usage frequency are also exhibiting higher factual usage. Interestingly, the mean value for average contributions is lower for daily users than for weekly ones, i.e. people with a high perceived usage frequency are not necessarily the most active contributors. Studying usage data has shown that many contributions are made by employees who are not daily users.

**Table 6. Perceived usage frequency vs. factual usage frequency**

	Perceived "Usage frequency"			
	daily	weekly	monthly	rarely
# respondents	140	341	371	627
Ø activity days	33.18	29.77	17.44	13.07
Ø visited KRs	21.11	16.74	8.78	3.01
Ø contributions	3.11	3.26	1.05	0.56
Ø followers	2.19	1.82	1.18	0.74

The next table shows that respondents with a perceived high helpfulness of References+ are also exhibiting higher factual usage, i.e. they visit more Knowledge References, generate more content, and have more followers. However, the user group rating References+ "very helpful" has a slightly lower mean value than the group rating it "predominantly helpful," i.e. employees with the highest perceived helpfulness are not necessarily spending the highest number of activity days on the platform.

**Table 7. Perceived helpfulness vs. factual usage**

	Perceived "Helpfulness"			
	very helpful	predom. helpful	partially helpful	not helpful
# respondents	146	222	805	306
Ø activity days	26.53	27.39	19.07	13.59
Ø visited KRs	25.88	20.39	5.90	2.45
Ø contributions	4.41	2.41	1.20	0.46
Ø followers	2.10	1.47	1.23	0.66

The next two tables show that visiting (i.e. viewing and reading) Knowledge References greatly affects people's perception that using the information from References+ saves them working time and money. However, the most active users in terms of days and visited Knowledge References do not necessarily perceive the highest time and money savings.

**Table 8. Perceived saved time vs. factual usage**

	Perceived "Saved time"			
	several days	one day	one/several hours	none
# respondents	123	144	437	775
Ø activity days	22.01	27.10	20.88	17.72
Ø visited KRs	23.96	25.25	7.80	4.92
Ø contributions	2.40	1.80	1.87	1.18
Ø followers	1.26	1.55	1.32	1.13

**Table 9. Perceived saved money vs. factual usage**

	Perceived "Saved money"			
	more than €10,000	€1,000 - €10,000	€0 - €1,000	none
# respondents	9	79	202	1189
Ø activity days	18.22	20.38	22.06	19.54
Ø visited KRs	12.22	20.61	14.07	7.76
Ø contributions	1.00	1.42	1.51	1.57
Ø followers	1.44	1.15	1.27	1.23

Employees who feel they generate more new business turnover definitely visit more Knowledge References. Because this was an optional question, the average values for all 670 users selecting "not relevant" are not presented.

**Table 10. Perceived new turnover vs. factual usage**

	Perceived "New turnover"				
	more than €1 million	€100,000 - €1 million	€10,000 - €100,000	€0 - €10,000	none
# respondents	3	17	51	109	629
Ø activity days	24.33	33.24	24.39	18.79	17.05
Ø visited KRs	5.00	42.82	30.04	8.98	5.59
Ø contributions	0.33	2.06	1.65	1.88	0.88
Ø followers	0.00	1.76	3.41	1.42	0.80

As shown in the next table, employees who feel that References+ helps them attract new customers have more factual activity days and visit more Knowledge References. Because this was an optional question, the average values for all 595 users selecting "not relevant" are not presented.

**Table 11. Perceived new customers vs. factual usage**

	Perceived "New customers"			
	3	2	1	0
# respondents	47	56	108	673
Ø activity days	31.55	27.34	16.67	16.65
Ø visited KRs	56.64	26.93	12.29	4.54
Ø contributions	2.70	4.29	0.81	0.75
Ø followers	1.94	2.13	1.66	0.79

The last table shows that employees with a better perceived overall rating also have more average activity days, visit more Knowledge References, make more contributions, and have more followers. There seems to be a strong relationship between perceived benefit and factual use. Because this was an optional question, the average values for all 300 users giving no rating are not presented.

**Table 12. Perceived overall rating vs. factual usage**

	Perceived "Overall rating"			
	very good	good	average	insufficient
# respondents	281	610	231	57
Ø activity days	29.96	22.11	13.29	10.05
Ø visited KRs	15.51	11.79	6.19	2.93
Ø contributions	4.69	1.13	0.76	0.44
Ø followers	2.60	1.10	0.83	0.67

## 5. CONCLUSION AND DISCUSSION

The goal of the presented research was to investigate whether and how survey results on the perceived use and benefits of a Web 2.0-based knowledge management platform match the factual use of this platform. The comparison of survey results with factual usage data reveals a tendency that frequent References+ users – especially in terms of reading activity – perceive higher benefits (i.e. helpfulness, saved time, saved money, new turnover, new customers). This tendency is not always reflected in the aver-

age number of contributions and the average number of activity days. The number of followers, usually an indication of the individual's degree of networking and a type of "status" within a virtual social network, does not show a correlation with the perceived benefit values in all cases.

An explanation of the observed phenomena might be based on the motivation to use and contribute to Web 2.0-based knowledge management platforms. Typically, users with high intrinsic motivation use such platforms more often than less motivated colleagues. Hence, the probability of perceiving any related benefit might be higher for frequent users since they are more active and thus able to explore a higher number of potentially positive aspects of the platform. Therefore, factual and perceived benefits are among the most important and sustainable motivation factors for using a Web 2.0-based platform such as References+. Providing immediate benefits for users can be the most crucial success factor for an Enterprise 2.0 initiative.

Some limitations of this study have to be discussed: One limitation is the fact that only registered platform users were invited to participate in the survey via e-mail. However, the content of References+ is accessible to all users of the Siemens intranet. Another limitation concerns the scientific rigor of the survey. The survey included questions addressing time savings and monetary aspects, which were of particular interest to management and the knowledge manager. The authors know that this approach does not completely conform to the principle of scientific rigor as some participants may be unable to link the perceived benefits with monetary aspects, savings, and additional customers. However, the intention of the survey was to explore and show a tendency of user participation and perceived benefits as key performance indicators. Against this background, a non-complex questionnaire with a set of closed practical questions was chosen to ensure a higher participation level. (There had been a pre-test with a few selected key users to refine the questionnaire and to make sure that all questions were well understood.)

User surveys are a common instrument to obtain quantitative feedback on perceived usefulness and helpfulness. They can reveal information on the ROI of a Web 2.0-based knowledge management platform if relevant questions are included. However, it should be noted for further analysis and discussion that survey results always reflect the subjective views of the respondents. Nevertheless, by using a high number of survey replies, a tendency could be derived by calculating average or median values. Based on the results of this paper, linking survey results to usage statistics is highly recommended when aiming to measure ROI since perceived usage will then be complemented with results on factual usage from the usage statistics analysis.

Last but not least, user surveys can be very helpful and effective in developing user-centered IT features and community coverage: The results show the basic needs of the user community, which helps avoid fundamentally undesirable developments. In addition, the results help clarify questions such as the following:

- Why are employees motivated to participate and contribute in online communities?
- What do employees expect from Web 2.0-based platforms? What do they miss in the currently available platform?

- Is there any correlation between objective use or contribution frequency and subjectively perceived individual benefits?

Replies to these questions are highly important for an efficient and user-centered development of a community platform and for the success of an Enterprise 2.0 initiative in general.

A follow-up user survey regarding References+ usage and benefits was conducted in April 2013, allowing further investigation of perceived use and benefits vs. factual use as it includes a more comprehensive questionnaire which supports deeper evaluation.

## 6. ACKNOWLEDGMENTS

The authors would like to thank the Siemens employees who participated in the 2011 References+ User Survey. Furthermore, the authors appreciate the financial support of the COMET K2-Research Centers for Excellent Technologies Program of the Austrian Federal Ministry for Transport, Innovation and Technology (BMVIT), the Austrian Federal Ministry of Economy, Family and Youth (BMWFI), the Austrian Research Promotion Agency (FFG), the Province of Styria, and the Styrian Business Promotion Agency (SFG).

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