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Stefan Stieglitz

University of Muenster, stefan.stieglitz@uni-muenster.de

Linh Dang-Xuan

University of Münster, linh.dang-xuan@uni-muenster.de

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Adoption and Use of Corporate Wikis in German Small and Medium-sized Enterprises

Stefan Stieglitz

University of Münster
stefan.stieglitz@uni-muenster.de

Linh Dang-Xuan

University of Münster
linh.dang-xuan@uni-muenster.de

ABSTRACT

In recent years, corporate wikis have been increasingly adopted in enterprises. However, little research is devoted to the adoption and use of wikis in small and medium-sized enterprises (SMEs), which are of high social and economic importance. The purpose of this paper is to examine the usage of enterprise wikis in SMEs and potential concerns that may hinder the diffusion of wikis in SMEs as well as other reasons for their reluctance to adopt wikis by conducting a survey of German SMEs. Findings indicate that a majority of SMEs do not intend to adopt wikis in their organization for various reasons. However, firms that have already introduced wikis seem to clearly benefit despite a number of concerns that might have a negative impact on the use and diffusion of wikis. Based on our results, we derive several implications for SMEs, in particular with respect to how to overcome these obstacles to adoption and diffusion of wikis.

Keywords

Enterprise Wiki, SME, Knowledge Management, Wiki Adoption, Wiki Diffusion.

INTRODUCTION

In the last few years, ‘Web 2.0’ technologies have been increasingly making way in organizational environments. The term ‘Enterprise 2.0’ emerged to reflect the use of social software within the corporate setting (McAfee, 2006). The attraction of social software is the ability to support new forms of informal, network-centric interaction and activity among people to create and distribute information and knowledge (Pfaff and Hasan, 2007). One type of social software platforms is enterprise wiki. According to previous literature, a wiki is defined as an open-author system for a conjoined construction and maintenance of websites allowing multiple users to share in creating, editing, and maintaining content via easy-to-use Internet technologies (Fuchs-Kittowski and Köhler, 2002; Hester and Scott, 2008). In corporate context, enterprise wiki represents a knowledge management tool allowing multiple users (i.e., employees) to capture and interconnect information (Leuf and Cunningham, 2001; Hester and Scott, 2008).

In the context of knowledge management (KM), enterprise wiki technology was considered the next generation of knowledge management system (KMS) overcoming the barrier created from the static accumulation of dynamic knowledge (Pfaff and Hasan, 2007). In fact, wikis are increasingly used for decentralized, collaborative KM of corporate knowledge communities (Tapscott and William, 2007). According to Pfaff and Hasan (2006), “a wiki can be said to be an evolving knowledge repository where users (i.e., employees) are encouraged to make additions to this repository by adding new documents or working on existing ones.” Recent studies showed that about one third of the surveyed large enterprises have already adopted wikis as part of Web 2.0 platforms (The Economist Intelligence Unit, 2007; McKinsey, 2008, 2009). Moreover, an international comparison showed that particularly large enterprises in the technology and media industry from the U.S., Europe, India and China were early adopters of Web 2.0 applications including wikis (The Economist Intelligence Unit, 2007).

Not only has a systematic and professional KM proven to play an important role for larger corporations, it also becomes increasingly relevant for small and medium-sized enterprises (SMEs) (Wong and Aspinwall, 2005). In particular, individuals’ work tasks in SMEs have become more knowledge- and communication-intensive requiring employees with different competencies from different organizational units and hierarchical levels to interact more with each other (Fuchs-Kittowski and Hüttemann, 2009). The authors also observed that SMEs started to recognize that individuals’ productivity is limited with regard to creativity and innovation, and consider social interactions within enterprises as a possible new source of innovations, which are of vital importance for SMEs. In this way, innovations would result from collaborative and participative processes of the generation and exchange of knowledge.

There is a growing body of academic literature on the adoption and use of wiki platforms in corporate context. However, while most studies focused on larger enterprises and followed a case-study approach or provided aggregated analyses of several Web 2.0 technologies, there is little research on the usage of enterprise wiki in SMEs explicitly. Since SMEs represent 99 percent of all companies in the European Union and employ about two third of the total workforce (European Commission, 2010), they are of high social and economic importance. Given their limited resources and capacities, SMEs have to make well-conceived decisions regarding the adoption of new technologies such as the implementation of a KMS or a wiki platform. In this regard, knowledge of key success factors as well as potential impediments may significantly improve their ability to make informed decisions on whether to move forward with a wiki project. In particular, it is important to identify factors behind the reluctance of SMEs to introduce wiki in their organization despite its potential benefits.

In this paper, we seek to contribute to the literature by exploring

- (1) the extent to which corporate wikis have been adopted by SMEs,
- (2) the usage of wikis in SMEs,
- (3) factors that might impede the diffusion of wikis in SMEs, and finally
- (4) reasons for the reluctance of SMEs to adopt wiki technology.

To address these research questions (henceforth denoted as RQ1 - RQ4), we conduct an exploratory survey of German SMEs. In addition, we aim to compare the results from our empirical analysis to earlier studies conducted to investigate wiki use in large enterprises. Finally, based on our results we derive several implications for SMEs, in particular with respect to how to overcome obstacles to adoption and diffusion of wikis.

The paper is structured as follows. In the next section, we review related research. Section 3 outlines our methodology, and Section 4 presents the results. In the subsequent section, we discuss our findings and their implications. Finally, we conclude by summarizing our results, outlining limitations and proposing potential future research.

RELATED WORK

In this section, we aim to extensively review the relevant literature. To our knowledge, enterprise wiki in connection with SMEs represents an area that has, to date, received little attention in academic research. In particular, there are only few studies that have dealt with the use of enterprise wiki in SMEs explicitly. One of these studies is, for example, the work by Fuchs-Kittowski and Hüttemann (2009). The authors presented a new Web 2.0-related approach towards an integrated collaboration and knowledge environment for SMEs. More specifically, they proposed a new conception for quality assurance in enterprise wikis including different methods to measure the structure of the wiki and user behavior.

Other studies have rather focused on KMS in SMEs. For example, Wong and Aspinwall (2005) identified several factors, which influence the acceptance of KMS in SMEs including management leadership and support, culture, information technology, strategy and purpose, measurement, organizational structure and resources. In addition, Judge (2007) proposed a model of the impact of information linkage on user acceptance of KMS in SMEs to examine whether there is a measurable point where the extent of links is such that the user community will value and accept KMS. More generally, Blinn et al. (2009) considered the application of Web 2.0 in SME networks. They pointed at a lack of academic literature concerning recommendations for the application of Web 2.0 artifacts in SME networks. Their work aimed at bridging that research gap by suggesting a conceptual base following the design science approach that considers multi-perspective (e.g., technical, organizational) requirements.

Although research on the use of wikis in SMEs has been sparse, there have been a growing number of both theoretical and empirical works regarding corporate wikis in general. On the theoretical side, works of Scott and Hester (2007), and Hester and Scott (2008) have made significant contributions to the literature by building conceptual models of organizational wiki usage as well as wiki technology diffusion. Scott and Hester (2007) posited that wikis can foster collaboration and knowledge sharing given existence of facilitators (e.g., fit of task and technology, effective motivation, and effective training), and absence of deterrents (e.g., cultural hurdles of hierarchy, reluctance to share knowledge and resistance to change). The implementation of wikis should particularly include consideration of organizational culture as well as user perceptions of wiki organizational compatibility, relative advantage against other platforms and complexity (Hester and Scott, 2008). The authors also stressed the importance of achieving and maintaining a critical mass of users. Pfaff and Hasan (2007) used Activity Theory to analyze wiki as a tool that mediates employee-based knowledge management activities and has the potential to democratize organizational knowledge. The authors' aim was "to frame the theoretical perspectives of the new processes of creation, accumulation, and maintenance of tacit knowledge in organizations."

On the other hand, empirical studies show that wiki technology was used to support a wide range of work activities within a corporation, including project team collaboration, information dissemination within communities of practice, idea generation, e-learning, technical support, customer relationship management, and resource management (e.g., Majchrzak et al., 2006; Hasan and Pfaff, 2006; White and Luttgers, 2007; Danis and Singer, 2008; Arazy et al., 2009). For example, based on a survey of 168 corporate wiki users, Majchrzak et al. (2006) reported that survey respondents claimed wiki participation provided benefits to them such as “enhanced reputation, work made easier, and helping the organization to improve its processes.” Likewise, in a case study of IBM, Arazy et al. (2009) found that corporate wiki users also rated highly the direct benefit of wikis in supporting their work and enhancing their productivity. The benefit seems to correlate with their level of proficiency with two thirds of survey respondents rating their proficiency as high. With regard to users’ contribution to corporate wikis, Majchrzak et al. (2006) divided wiki contributors into three groups: ‘adders’ (who add new pages and content), ‘synthesizers’ (who integrate, reorganize, and rewrite whole paragraphs) and ‘commenters’ (who comment and make only small corrections). While adders were more likely to be using wikis to make their work easier and to fulfill their role on a project, synthesizers, on the other hand, appreciated coming up with novel solutions, reputation gained from contribution, and how much their content was viewed by others. Primarily, synthesizers were interested in the impact they made, whereas adders were more interested in getting their job done.

Although wiki technology has begun to be adopted within the enterprise, the extent of the impact it has on collaboration and knowledge sharing within a corporation (e.g., the level of usage) remains relatively low (e.g., Arazy et al., 2009; Danis and Singer, 2008). Several studies have focused on factors that impede the adoption and diffusion of wiki in enterprises. Based on case study of an organization that had decided against the adoption of wikis, Hasan and Pfaff (2006) outlined different concerns on the management, social, technical and legal level. In particular, wikis might flatten the organizational hierarchy and change traditional and hierarchical communication channels more than desired, and if knowledge is considered as power, managers may be reluctant to share this power with their subordinates. White and Luttgers (2007) also pointed at the lack of management support due to the fear of openness in wikis. In addition, Holtzblatt et al. (2010) identified two major factors contributing to the unwillingness to share information on the corporate wiki platform. The first consists of the reluctance to share specific information due to a perceived extra cost, the nature of the information, the desire to share only “finished” content, and sensitivities to the openness of the sharing environment. The second factor refers to the reliance of users on other non-wiki tools based on a variety of factors including work practice, lack of guidelines, and cultural sensitivities. Another problem that could impact the use of corporate wiki is “wiki proliferation” comprising redundant or outdated content (Happel and Treitz, 2008). Based on six qualitative interviews, the authors showed that proliferation is a serious problem and analyzed its causes, consequences and common countermeasures.

From a network-based perspective, Müller et al. (2008) investigated whether wikis are an adequate KM tool by proposing a new approach to analyze existing knowledge exchange processes in wikis based on social network analysis. Results based on case studies showed that, in early stages of a wiki, so-called “wiki champions” have a critical importance for the development of a wiki information space. They are recognized as early adopters who understand how to use a wiki very well and are able to encourage others to use wikis. As a consequence, more and more employees would join the “wiki champion” and, in turn, engage other people in the wiki.

In summary, previous studies on corporate wikis focused on organizational adoption, sustainability, user motivations, and concerns, which might hinder the adoption and use of enterprise wiki. However, as noted above little research was dedicated to wiki adoption and use in the context of SMEs while methodologically mostly relying on the case-study approach.

METHODOLOGY

To address our research questions, we follow a qualitative research approach by conducting an extensive survey of a large number of German SMEs. In doing so, we are able to provide a comprehensive insight into the adoption and use of wikis in SMEs as well as to explore potential barriers to the adoption and diffusion on a larger scale.

In the period from August 01 to 31, 2010, we contacted about 1,000 companies across different industries mostly from the North Rhine-Westphalia region in Germany asking them to participate in an online survey. Contact data were provided by the local chamber of industry and commerce. Most of the addressed companies are SMEs by the current definition of the European Union, i.e. the number of employees does not exceed 250 (European Commission, 2003). However, to maintain the possibility of comparison, we also recruited a smaller proportion of larger firms (i.e., more than 250 employees) for the survey completion.

The survey was structured as follows. First, we started out by giving a thorough definition of “enterprise wiki” to ensure that participants (i.e., persons who complete the survey on behalf of their company) have the same understanding of the matter they will be dealing with in the survey. To address RQ1, we then asked participants whether they have already adopted one

or several wiki platforms in their organization. Depending on their answer, respondents were assigned a corresponding subset of follow-up questions. On the one hand, respondents of firms that have already adopted wikis were asked to give answers to questions about the wiki status quo in their organization, process of wiki adoption, areas and benefits of wiki use, as well as evaluation and plans for the future regarding adoption of other Web 2.0 platforms (RQ2). Moreover, participants should also report factors that may impede the diffusion of wikis in their firms (RQ3).

On the other hand, firms that have not adopted wikis were asked whether they are planning or considering a wiki adoption in the future. In such case, participants should also indicate expected benefits as well as potential concerns related to wiki adoption and use. Finally, we posed a number of questions to firms that have explicitly rejected the adoption of wiki to elicit and examine the reasons for organizations' reluctance to adopt wiki technology (RQ4). At the end of the survey, we asked all participants to provide information about number of employees, sales, geographical affiliation, and industries of their firm, as well as information about the position of the participant within his/her organization. In total, the survey comprises 74 questions of different types including yes-no and multiple-choice questions, rating scales as well as open-ended questions supporting the exploratory approach. With regard to open-ended questions, data analysis took place by using the open-coding (Bailey, 2007) and content analysis methodology (Mayring, 2000), i.e., we extracted relevant quotations from the data and derived conceptual categories. The quotations were assigned to the coding categories by two independent coders. Inter-coder reliability constituted 0.85 ($p\text{-value} < 0.000$) suggesting a high level of agreement between the coders (Landis and Koch, 1977).

We closed the survey after having obtained responses from 113 enterprises in total. This yielded a response rate of about 12 percent. The sample comprises 88 SMEs and 25 larger firms. The majority of SMEs have 50 to 100 employees with sales ranging from three to ten million euros. The diversity of industries in which the sample firms are engaging is quite high covering IT/communication, construction, utility, retailing, manufacturing, financial and insurance as well as other services. Furthermore, more than half of the respondents occupied positions as manager or firm owner, while mostly heads of the IT department constituted to the rest of the respondent sample.

RESULTS

Wiki Adoption in SMEs

We address the first research question by looking at the proportion of SMEs that have already adopted wikis in their organization. Table 1 shows that, in our sample, there are only 20 of such firms out of a total number of 88 SMEs implying an adoption ratio of 23 percent. This figure is lower than the corresponding proportion of the larger firms in our sample that have also introduced wikis (28%).

	Frequency (Total Number of Firms)	Adoption Ratio
SMEs (max. 250 employees)	20 (88)	23%
Larger Firms (> 250 employees)	7 (25)	28%

Table 1. Wiki adoption ratio of SMEs and larger firms in the sample.

As shown in Table 2, adoption ratios for large enterprises found out in other studies are even higher ranging from 32 to 39 percent (The Economist Intelligence Unit, 2007; McKinsey, 2008, 2009).

Moreover, only 9 percent of SMEs in our sample state that they are planning or, at least, contemplating the adoption of wikis compared to 24 percent in the sample of larger firms. Overall, as shown in Figure 1, the proportion of SMEs that either have adopted or are planning to adopt wikis (32%) is significantly lower than that of larger firms (52%). This is consistent with findings from other studies (e.g., Forrester Research, 2010) showing that the ratios of Web 2.0 adoption and Web 2.0 planning decrease with smaller firm size. Our results indicate that, in the near future, the adoption of wikis in SMEs might not grow as strongly as expected for larger enterprises by other studies (e.g., Bitkom, 2008; McKinsey, 2008).

	Frequency (Total Number of Firms)	Adoption Ratio
EIU (2007)	134 (406)	33%
McKinsey (2008)	636 (1998)	32%
McKinsey (2009)	412 (1032)	39%

Table 2. Wiki adoption ratio of larger firms in other studies.

Among SMEs that have adopted or are planning to adopt wikis, companies from IT/telecommunication and service sector account for the largest proportions (25% and 20%, respectively). This result corroborates findings from other studies such as McKinsey (2009) showing that high-tech companies are most likely to report measurable benefits from Web 2.0, followed by those offering business, legal and professional services. On the other hand, SMEs in our sample that do not plan to adopt wikis mostly come from the manufacturing, construction or retailing industry (25%, 15% and 12%, respectively).

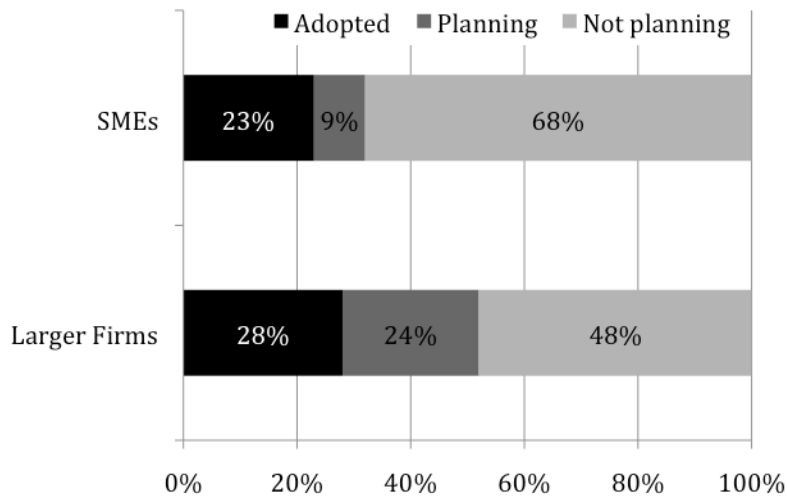


Figure 1. Distribution of firms that have adopted, are considering, and rejecting corporate wikis grouped by SMEs and larger firms in the sample.

Wiki Usage in SMEs

We uncover several purposes of use of wikis in SMEs that have already adopted wikis. These include creation of a common knowledge pool, documentation of corporate processes, administration of document repository, training of employees, and (internal) publication of latest work results (see Table 3). Furthermore, wikis are mainly adopted in the IT department followed by sales, product management, production, and R&D department. In particular, employees in the IT department use wikis to facilitate the exchange of IT-knowledge, employee trainings as well as software and code documentation. Also, it is mostly the IT department that initiated the adoption of corporate wikis. Regarding sales activities, wikis are supposed to support exchange of experience, improvement management, interaction between employees and field sales, as well as field sales trainings. Firms thereby expect several potentials such as faster training of employees, more input from collaboration on different instances, location-independent information supply, and better preparation for sales-pitch argumentation.

In our sample, all SMEs that have adopted wikis use them only for internal usage (KM). In other studies such as The Economist Intelligence Unit (2007), 37% of larger enterprises stated to provide wikis for customer related purposes and 38% deployed wikis to work with external partners/suppliers.

Interestingly, results show that only a minority of firms (11%) have attempted to assess the success of their wiki adoption. Fuchs-Kittowski and Hüttemann (2009) already argued that the success of wiki adoption is not only associated with an

increase in the number of users but also the quality of wiki contents. However, to measure and ensure quality of corporate wikis, the management needs to have a variety of methods and instruments that, in turn, may overstrain the limited resources of SMEs. Our findings are also consistent with those from other studies, which showed that many companies and particularly marketers might experience difficulties in identifying measures for the evaluation of success of social media and social investment (Mzinga and Babson Executive Education, 2009). Many SMEs also state that they are unable to evaluate the potential of Web 2.0 technologies (Blinn et al., 2009).

	Percentage of Respondents
Common knowledge pool	93%
Documentation of corporate processes	67%
Document repository	37%
Training of employees	26%
(Internal) publication of latest work results	22%

Table 3. Actual wiki usage by SMEs that have adopted wikis.

Overall, our analysis shows that SMEs that have adopted wikis in their organization exhibit a relatively high level of satisfaction (on average, 3.5 on a rating scale of 5). More than half of them are additionally considering the adoption of other Web 2.0 technologies such as instant messenger, blogs, and social networking sites.

As a next step, we take a closer look at SMEs that are contemplating adopting wikis in the near future. The most cited reasons for planning wikis include training of employees, improvement of knowledge documentation, interaction between employees, and document sharing. These expected benefits are similar to the actual usage identified above implying that expectations of SMEs regarding wiki use could be fulfilled to a certain extent (see Table 3 and 4). In addition, we find that SMEs are fairly confident that the adoption of wikis in their organization will be a success (3.5 / 5 on average).

	Percentage of Respondents
Training of employees	90%
Improvement of knowledge documentation	80%
Interaction between employees	69%
Document sharing	40%

Table 4. Expected benefits from adopting wikis by SMEs that are planning to adopt wikis.

Impediments of Wiki Diffusion

Although SMEs in our sample seem to clearly benefit from the adoption of wikis, they also express a variety of concerns. Our findings provide insights into the factors that might impede a broader usage of wikis for knowledge sharing. Not surprisingly, the biggest concern inferred from the results of our survey is a low degree of employee acceptance as employees, for example, might see no tangible benefits from using wikis. They perceive the contribution to wiki to be too time-consuming, while not considering it a task required as part of their paid work. Employees thus would have no incentives to share information on wikis. This is consistent with findings of Holtzblatt et al. (2010) showing that users might not feel inclined to share information because of the extra time and effort involved, while not being rewarded in any forms for sharing.

Just as importantly, about one half of SMEs report that firm culture and existing corporate processes could be a significant hindrance to a thorough diffusion of wikis. These findings support the notion that organizational culture, defined as the attitudes, experiences, beliefs and values of an organization (Turban et al., 2002), as well as business processes are of particular importance to the diffusion of innovation and, more specifically, of wikis (Hester and Scott, 2008). In contrast,

technical issues are less relevant when considering wiki adoption, as it is relatively simple to technically introduce and maintain a wiki system.

	Percentage of Respondents
Low degree of employee acceptance	60%
Corporate culture	55%
Corporate processes	44%
Technical issues	15%

Table 5. Impediments of wiki diffusion in SMEs.

Firms that are considering a wiki adoption also share similar concerns. In particular, they are unsure about that the use of wikis might entail an unbalanced cost-benefit ratio from user's as well as organizational perspective. Another concern is that the adoption of new technologies such as wikis might overcharge senior employees who are more likely to exhibit a lower degree of IT knowledge. This might prove to be an obstacle to wiki usage as, according to Hester and Scott (2008), user perception of wiki complexity might decrease diffusion.

Reasons for SMEs' Reluctance to Adopt Wikis

The fact that the majority of firms in our sample have rejected the adoption of wikis makes it indispensable to explore the reasons for the reluctance of SMEs to adopt wikis in their organization. As shown in Table 6, 30 percent of the wiki-rejecting SMEs in our sample state that they (or more specifically, their management) do not see any obvious benefits from using wikis. This is in line with other findings from the Web 2.0 literature. For example, Blinn et al. (2009) observed that for some SMEs, the term Web 2.0 is almost unknown and its benefits is unclear, as Web 2.0 "comprises a multitude of technologies, applications and services that provide different functionalities and services that are hardly to differentiate." A similar fraction of firms are concerned that their organizational structure is ineligible for a wiki adoption. In particular, most SMEs with no more than 50 employees (small enterprises) indeed consider themselves as organizations with little formal structures being simply too small for an adoption of new technologies such as wikis.

Interestingly, 20 percent of SMEs report that they are already using other non-wiki platforms for tasks that would have otherwise been performed by wikis. As long as a certain number of functionalities can be covered by existing systems, people tend to be reluctant to learn another tool. These findings, however, also imply that a certain number of firms would acknowledge the benefits of wikis and would have adopted them if they were not already using other systems.

Furthermore, surveyed SMEs also report that their IT infrastructure and capacity might be inappropriate for an adoption of wikis. Even if they would be willing to introduce wikis, the implementation would be too costly from their point of view. However, only a small fraction of SMEs share these concerns suggesting that cost factors and technical aspects are not a big issue even for SMEs. Rather, organizational factors on the level of management and employees involving understanding and perceived usefulness of wikis seem to play a much more important role in the wiki adoption decision (see Table 6).

	Percentage of Respondents
Benefits not obvious	30%
Ineligible enterprise structure	28%
Reliance on other non-wiki tools	20%
Lack of employee interest	18%
Wiki implementation too costly	12%
Inappropriate IT infrastructure	9%

Table 6. Reasons for SMEs' reluctance to adopt wikis.

DISCUSSION AND IMPLICATIONS

Based on the results of the survey, we can answer RQ1 and state that the extent to which wikis have been adopted by SMEs is still relatively small compared to larger firms in our sample. Other studies investigating wiki usage of larger firms support this finding. Moreover, only a fairly small fraction of SMEs intend to adopt wikis as an instrument of their KM in the near future. This suggests that the reasons against the adoption of wikis still outweigh potential benefits for the majority of SMEs.

A number of insights emerged from the results of this study, which allow us to derive several implications for SMEs. Regarding RQ2, we identified the most important wiki usage practices and found out that firms that have already introduced wikis seem to clearly benefit from the use of wikis, despite potential concerns (RQ3) related to employee acceptance, corporate culture and processes. However, to attain a high level of diffusion SMEs need to tackle these concerns. In particular, the management should fully support and formulate clear goals of the use of wikis in the company. As further implication, incentives could be provided to reward employees' participation reducing their unwillingness to share content. In doing so, employees would be more motivated and committed to contributing and maintaining wikis. More specifically, it is important to ensure a high level of quality and actuality of the wiki articles from the beginning to reach the critical mass of users by identifying and providing lead users with incentives to encourage other employees to use wikis. As Müller et al. (2008) already noted, right after the roll-out of wikis, firms might try to identify at least one extremely active user ("wiki champion") who is able to encourage other employees and get them involved by informally training them and being available for ongoing support. In doing so, SMEs may quickly get a high level of diffusion compared to larger firms due to their small size and the resulting flexibility.

However, this advantage might be offset by a management-related effect. In many cases, the management itself could be an impeding factor as managers may be reluctant to IT-related organizational changes. This might be even more relevant in case of SMEs where managers, who can also be owners of the firm at the same time, have a particular role. Literature has shown that the personality of firm owners and their attitude to do business considerably influence SMEs (e.g., Masurel et al., 2003; Levy and Powell, 2005). The strategic horizon is rather short with focus on a survival strategy and a reactive decision style due to limited resources (Levy and Powell, 2005). In some cases, the SME's owner is the only person with authority and (mostly limited) knowledge to identify IT opportunities and to adopt them. As a consequence, the adoption of new technologies highly depends on the owner's personality, experience and skills (Street and Cameron, 2007). In fact, our findings showed that managers or owners of SMEs that have decided to introduce wikis tend to be themselves active user of wikis and other social software platforms, both in professional and private context. Conversely, managers or firm owners who do not contemplate adopting wikis in their company are less inclined to use social software or other technologies in general. In this regard, initiatives from the IT department (if existing) aiming at convincing the management of the advantages of wikis or other Web 2.0 platforms might be helpful. Results of our study showed that, in more than half of the SMEs that have implemented wikis in our sample, it was mostly the IT department that initiated the adoption of corporate wikis.

Our results regarding RQ4 showed that, for many managers and/or employees, the benefits from using wikis are rather not obvious. This may result from their lack of IT skills and knowledge of wikis specifically. At this point, the role of the IT department might again be of importance as they might provide the management with information that illustrate both benefits and potential concerns of wiki use in more details. On this basis, the management would be able to make more informed adoption decisions. Eventually, SMEs need to ponder whether corporate wikis, at the bottom line, are really useful for them or not. This is particularly important for SMEs as they may have more to risk in taking on larger IT projects such as the implementation wikis, given that their resources and capacities are limited. In case of adoption, the IT department could also help the management develop strategies to encourage employees to use wikis until reaching a critical mass of users.

In summary, our findings suggest that wiki adoption is affiliated with primarily non-technical barriers and challenges. In particular, these include "soft" factors such as management attitude and employee acceptance, rather than "hard" ones involving cost aspects and technical issues (e.g., system integration). Hence, in general, it is important for SMEs to take these "soft" factors into account when considering a wiki adoption. However, given that SMEs, due to their firm size, have significantly different organizational structures and characteristics compared to large enterprises, further research is required to explore appropriate approaches and methodologies for SMEs to meet the described challenges. Some researchers already addressed similar issues related to community building and community management (e.g. Wenger, 2002; Kollock, 1996; Bourhis et al., 2005; Leimeister et al., 2006; Rosenkranz and Feddersen, 2010). However, it can be assumed that these approaches are not sufficiently developed for practical usage in SMEs until now. Another important issue is the evaluation of the success of wiki adoption as well as how to measure wiki diffusion. Researchers have proposed approaches such as social network analysis to measure interaction and collaboration among wiki users as well as linkage of documents (e.g., Müller et

al., 2008; Blaschke and Stein, 2008). However, these methods also lack practical relevance, especially for SMEs with their limited resources and capacities. Further research is thus needed in this regard.

CONCLUSION

Adopting wikis to manage knowledge can be highly beneficial, but also entails various challenges for SMEs. This paper addresses this issue, which has so far received little research attention, by conducting a survey of a number of German SMEs. In particular, the contribution of this paper is two-fold. First, we identified benefits of wiki use, impediments to wiki diffusion, and factors that hindered wiki adoption for a majority of SMEs. Second, based on our results, we derived several implications for SMEs to overcome obstacles to wiki adoption as well as impediments to wiki diffusion.

One limitation of our study is that we have focused only on German SMEs, which are mostly based in the North Rhine-Westphalia region. Also, the overall sample size is relatively small, particularly with regard to the number of larger firms that were included in the survey for the sake of comparison to SMEs. As future research, we will attempt to validate our findings based on a larger sample by recruiting more SMEs as well as larger firms. Moreover, we seek to conduct a number of personal interviews to deepen our understanding of the adoption and use of wikis in SMEs, as well as barriers to wiki adoption and diffusion on a larger scale. In addition, we aim to increase the geographical diversity of firms to be recruited (e.g., SMEs from other European countries and/or the U.S.) in order to conduct comparative analyses.

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