Intranet 2.0 Based Knowledge Production

An Exploratory Case Study on Barriers for Social Software

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Abstract— **The evolution of static intranets to dynamic web 2.0 based information systems is one way to provide space for the collaborative production of knowledge within an enterprise. Despite the fact that social software is now commonly provided for intra-company usage, this usage is below expectations in many cases. This paper, based on an exploratory case study in an international bank, shows the drawbacks as well as the drivers for the participative generation of knowledge using web 2.0 tools within an intranet. The findings, against the background of recent technology-oriented research, are three groups of possible barriers which are intertwined and therefore influence each other, namely organisational, cultural and technological barriers. Above all, the results of the case study suggest it is less meaningful to discuss if and how social software may or may not change organisations but to interpret the findings in a social science-based framework by taking the work of Boltanski & Chiapello and their understanding of the new forms of work organisation into consideration. This interpretation, while preliminary, suggests that employees using Web 2.0 software for knowledge production struggle with the ambiguity between the demands of these new forms of work and the existing, traditional organisational structures.**

Keywords - Intranet 2.0; Collaboration; Knowledge Production; Barriers; Enterprise 2.0

I. INTRODUCTION

Implementing interactive Web 2.0 based software for organisation internal usage is often accompanied by diffuse expectations, such as better knowledge management or increased productivity. However, current data shows that investment in collaboration software in many cases does not fulfill these intentions, as the usage of the tools is below expectations [1]. Nevertheless, social software based on web 2.0 principles [2] [3] is widespread in enterprises [4] [5] [6] [7] [8]. Placing the focus on the internal usage of web 2.0 based software, enterprises are now leaving the 1.0 era of intranets and turning to social intranets, providing blogs, wikis and features for social networking, such as user profiles, activity streams and microblogging [9]. Such intranet 2.0 platforms [10] are to be used by employees for information exchange, communication, networking, coordination and the collaborative production of knowledge. Driven by an IT industry hype, these projects focus on currently discussed Enterprise 2.0 concepts such as open communication, open information access, enhanced cross-departmental collaboration and open innovation. However, the realisation of these aspects is below expectations [8]. Intranet 2.0 in the above sense is a subset of Enterprise 2.0 aiming at the organisation´s internal communication and collaboration. Therefore findings of the current Enterprise 2.0 discussion are highly relevant for intranet 2.0 projects.

The term Enterprise 2.0 was proposed by McAfee [11] as "*the use of emergent social software platforms within companies, or between companies and their partners and customers*". This marked the beginning of a lively and still ongoing discussion among researchers as well as practitioners about how enterprises may benefit from the usage of social media. The current discussion concerning "*the deep impact on organisational and cultural changes*" of Enterprise 2.0 projects [12] considers the possible changes in the ways people communicate, share information, contribute and make decisions, due to the new active role of the users. But unfortunately these discussions are characterised by a lack of specific results and diffuseness. To date, there is little research into the interplay between the success rate of implementing Enterprise 2.0 initiatives, the organisation of work that manifests itself in the form of organograms, business process descriptions and standards within companies, and finally, norms and values which are rooted in a company's corporate culture.

The present paper, therefore, aims to fill part of this gap by presenting a case study on an intranet 2.0 project in an international bank: We analyse *what the potential barriers as well as the potential drivers for the collaborative production of knowledge using social software are*. Against the background of technology and business oriented research, we chose a more human-centred approach considering soft factors such as norms and values, attitudes and organisational paradigms that are all reflected in the rules and standards of the organisation.

The paper is divided into five parts. In the introduction, the context is established and the problem as a gap is addressed. Section two begins by outlining the theory underpinning the research, and discusses how the term collaboration is embedded in the Enterprise 2.0 discussion. This part then reviews the literature concerning the organisational and cultural aspects of collaboration using social software and also considers a social science

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perspective on work organisation in general. Since a substantial part of Enterprise 2.0 empirical research is documented in cases studies [13], we chose a case study approach, too. Our case study design and our research method in detail are described in section three. Section four focuses on the specific drivers and barriers as a result of the case study followed by a discussion of the results. The fifth and last section, the conclusion, discusses the consequences for future intranet 2.0 projects and includes an outlook for further research.

II. COLLABORATIVE KNOWLEDGE PRODUCTION WITHIN THE INTRANET 2.0

The amount of related literature that has been published on collaborative knowledge production within intranet 2.0 is very limited. For this reason, the more general question about whether the use of social software is adequate for knowledge workers to generate new knowledge was used as a starting point for the literature search: Levy [3] investigated how knowledge management could and should be enhanced in light of the Web 2.0 and states that the principles of Web 2.0 and Knowledge Management are very similar. Finally, she recommends adopting the participative nature of Web 2.0 for production and sharing of knowledge in organisations and suggests starting with wikis and blogs. Studies at Fraunhofer ISST [14] show that the use of Web 2.0 in enterprises has its biggest impact on knowledge work, innovation and cooperation, although its potential is hardly exploited. Paroutis and Al Saleh [15] likewise state that blogs, wikis and other social software have distinct technical features that foster knowledge sharing. Stocker [16] as well shows in an empirical study that knowledge transfer within enterprises profits from wikis and blogs. Also current data on usage of Web 2.0 software in enterprises has shown benefits for knowledge management such as increasing speed of access to knowledge [4] and more efficient usage of explicit and tacit knowledge [6].

Looking closer at the development of "*collaboration*" as a term for people working together to reach a common goal, we find a close connection to the SLATES-concept of McAfee [11] that was extended to FLATNESSES by Hinchcliffe [17]. SLATES is an acronym for Search, Links, Authorship, Tags, Extensions, Signals and was created to provide a basic concept for Enterprise 2.0 software. The extensions added by Hinchcliffe [17] include Freeform, Network-oriented, Social, and Emergence. Software providing these features and characteristics empowers users to participate in and contribute actively to the information flow inside an enterprise and also across organisational borders, in the same way as they are used by social software platforms in the public web. By these means, Web 2.0 principles such as transparency, accessibility and personalisation can find a way into an organisation. To sum up, electronic collaboration (E-Collaboration) can be seen as a special case of IT-supported cooperation to achieve a common goal with shared responsibility for the results [18] using software with its nucleus in Enterprise 2.0 strategies: *Authoring* (access to platforms to produce one's own content), *Social* (not hierarchical, transparent) and *Network-oriented* (Web-based, addressable and reusable content).

Enterprise 2.0 software enables freeform collaborative production of content without an imposed structure such as predefined business processes or hierarchical access rights [19]. According to Schachner and Tochtermann [20], the internal use of Web 2.0 software requires and/or leads to changes in the way people work together: self organisation instead of top down coordination in terms of spontaneous, mostly voluntary cooperation; open information flow instead of secretly working task forces; trust and openness to criticism instead of sanctioning mechanisms; and individual responsibility for "pulling" the necessary information. This goes hand in hand with a change in the mindset of the users, namely thinking in business models and solutions instead of concentrating on the technology.

How Social Software Will Change the Future of Work is not only the subtitle of Cook´s book on Enterprise 2.0 [21] but also one of the central questions discussed in the Enterprise 2.0 community. On the one hand, the discourse is dominated by business consultants and analysts such as Don Tapscott [22], Dion Hinchcliffe [9] [17], Andrew McAfee [11] [19] and Niall Cook [21], many of who argue that social software is a driver of organisational and cultural changes. They believe that giving employees the technical possibility to collaborate eventually initiates the transformation of enterprises into, to some degree, non-hierarchical, self-organised networked organisations with an open culture. On the other hand, authors with a knowledge management perspective suggest that an appropriate organisation and culture is a prerequisite for E-Collaboration rather than a consequence: Davenport [23] states in his blog that "*the absence of participative technologies in the past is not the only reason that organisations and expertise are hierarchical*". Schneckenberg [24] also argues that organisational factors, such as adequate decision-making policies, corporate governance and value systems ingrained in the corporate culture, are preconditions for the acceptance and sustainable use of Web 2.0 technologies in companies. These findings suggest that flat hierarchies and transparency, either as a prerequisite or a consequence, are closely connected with successful E-Collaboration using social software as internal tools.

For this reason, it seems useful to look closer at the aims and objectives behind fostering collaborative work and to also take the impact of the work organisation into consideration. In their major work "The New Spirit of Capitalism" [25], Boltanski and Chiapello reviewed management literature that influenced the thinking of executives and employees of companies over the last decades. They argue that the hierarchical Fordist work structure was abandoned from the middle of the 1970s onwards and a new network-based form of organisation came into existence. This new form of work organisation is founded on employee initiative and work autonomy.

According to Boltanski and Chiapello [25], the "new spirit of capitalism" means self-fulfillment as a strategy to mobilise labour. The new highly flexible work force does not separate social life into a private and a professional part, but

lives and acts in a networked world with multitudinous contacts in projects as the main organisational unit. Everything can be a project – the construction or the closedown of a plant, the reorganisation of a company or a play in a theater [25].

The new work force is characterised by intrinsic motivation, self-organised effort, autonomy, self-management, spontaneity, and communicative competence using social media. People are either self-employed (micro-enterprises) or work as an employee competing in internal markets, with teamwork being highly important due to the rising numbers of projects and project like-tasks. These new work structures demand high flexibility and mobility together with permanent reachability.

In this new form of work organisation *activity* is the new norm to measure the value of people and objects. *Activity* means starting projects and contributing actively to projects while using networks for contacting and getting information to eventually initiate new projects [25]. Consequently, the traditional norms *efficiency* and *properly executed actions* have been replaced.

III. CASE STUDY

In knowledge management research, the case study method is often applied since it has broad applicability. Hence, there are different kinds of case studies depending on the underlying research design [26] [27].

A. Case Study Design

As mentioned before, little research has been done into how work organisation, a company's corporate culture and the success rate of implementing Enterprise 2.0 initiatives interact with each other. In this early stage of research, when "*…"how" questions are posed, the investigator has little control over events and the focus is on a contemporary phenomenon within a real-life context*" [26], case studies are the preferred method. Yin [26] differentiates between three basic types: exploratory, explanatory, and descriptive case studies. Each of these approaches can either be single or multiple case studies.

Our case was a single case study examined using an exploratory design, as data was first collected and then patterns in the data were identified. To achieve a more abstract view, the identified patterns were put in a theory based frame and a more general model was derived.

B. The Case

In May 2009, an international financial services provider based in Austria decided to build up a new intranet. The aim was to provide up-to-date information for the employees as well as to enhance collaborative work. In the following year, a pilot project using Microsoft® SharePoint® Server 2007 as a platform was implemented and more social software applications for rating, commenting, communicating in forums and wikis were added. One major task of the intranet 2.0 project was the implementation of so-called "topic areas" on the SharePoint® Server. These areas were intended to be managed and used by specific employees, called "topic coordinators". These were highly skilled specialists, e.g., software development specialists, who were responsible for the production and the enterprise-wide distribution of topic-specific knowledge. The new topic areas were designed as future places for participative production and allocation of topic knowledge under the lead of the coordinators. The whole intranet 2.0 initiative was seen as a first step to becoming an Enterprise 2.0.

In the pilot phase, about 200 intranet users were invited to participate. Although there were plenty of internal marketing activities for the new intranet, the usage of the new platform, measured by key performance indicators produced by the SharePoint® Server, e.g., usage statistics, fell short of expectations. In particular, the project leader was not satisfied with the low activity of users participating in the topic areas. The idea of providing a well-designed platform to enable employees to participate and give their input and comments on various topics simply did not work as intended.

At this point of time, the authors of this paper were invited to analyse the situation, identify what was causing the unsatisfying key performance indicators and propose improvement measures based on the findings.

C. Research Method

First, the project leader of the bank was interviewed using a problem-centred interview technique to give orientation and facilitate generation of first assumptions. Based on the received data, a focus group consisting of selected topic coordinators was established, who also represented the users of the platform. A set of workshops with this group was designed to undertake an in-depth analysis of the situation. Finally, three workshop sessions moderated by the authors of this paper took place. Each workshop was followed by discussions within the research team and first assumptions about the roots of the identified barriers were generated. These assumptions were subject to a deeper, theory-based analysis and were again reflected on with the members of the focus group in the next workshop session.

IV. FINDINGS

The researchers placed their main focus on identifying the barriers or drawbacks for the unsatisfying usage of the topic areas. However, the drivers for the collaborative knowledge production were also discussed: The members of the focus group identified the topic areas used as a central knowledge repository with a well structured file sharing and good search function as helpful. This knowledge repository was a storage for longer existing documents that had already passed a quality assurance process. Therefore, all employees who had access to this repository could be sure to get information that was up-to-date and confirmed by management. As a consequence, employees had less need to call the topic coordinators by phone in case of a specific question or to send them an email that induced a time relief for the specialists. Another factor influencing the usage of the new topic areas positively was the possibility to get automatic alerts when a document was changed. Nevertheless, the documents in the repositories were mostly static files with no need to update frequently.

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A significant part of the analysis of the drawbacks was discussing the underlying causes. Consequently, three types of barriers were identified, each characterized by being embedded in the same context:

- *barriers rooted in the organisational culture* (in the values and behavioural norms of the organisation)
- *barriers rooted in the organisation itself* (in the organisational structure and the business processes)
- *barriers rooted in the technology* (in the implementation of applications).

The following paragraphs explain the three barrier types as identified in the case study in detail followed by a discussion of the findings.

A. Barriers rooted in the organisational culture

Each organisation has its own internal values and often unspoken behavioral norms that may be contrary to Enterprise 2.0 paradigms such as open communication, self organisation or decentralized decisions. In the explored case study, the norm "valid knowledge has to pass a certain quality assurance process" was dominant due to compliance requirements of a financial service provider. Not surprisingly, this was one of the underlying reasons for the unsatisfying usage of the topic areas in the intranet 2.0. Furthermore, the identified attitudes regarding a "no blame organisation" were different among employees of the bank: some believed in the participation of many to produce knowledge of high quality (wisdom of crowds concept) whereas some adhered to the traditional belief in the expertise of a few, highly-skilled specialists. As part of the organisational culture, knowledge was seen as something owned by the organization that should be distributed within the organisation only carefully (similar to a company secret). Even IT knowledge that was found on the public web was affected by this approach.

Furthermore, E-Collaboration and participation in knowledge production need an organisational culture, where self-organisation and sharing is desirable. The traditional hierarchical culture of the financial service provider in our case study, based on divisions and command and order, allowed only little room for acting autonomously and collaborating beyond the daily routine. In particular, the understanding and expectations of E-Collaboration varied between management, project management and the users.

B. Barriers rooted in the organisation itself

Among other things, an organisation is manifested in the structure or hierarchy of an enterprise. In the analysed case, the hierarchy of the organisation, represented in divisions, departments and sub-departments, was mapped in the intranet 2.0 applications and the corresponding access rights, thus restricting E-Collaboration and participatory production of content. But, what was most important, there was no organisational link between the daily work in the business processes and the content generation in the topic areas. In addition, employees lacked time to work on the topic areas besides their daily routine. The job descriptions of employees were not updated to accommodate the new tasks and responsibilities resulting from the usage of the new intranet. The internal organisational rules left marginal space for knowledge production besides the highly standardised quality assurance processes; there was nearly no possibility for open, dynamic and up-to-date ad-hoc generation and usage of content. It was also still unclear and under discussion who the potential users were and what usage the content stored in the topic areas was intended for.

The former role of the topic coordinators before starting the intranet 2.0 project was that of a specialist collecting information, generating and distributing knowledge within the organisation (one-to-many communication). In the discussion with the coordinators, we found different attitudes about if and how this role had to be changed to foster participation of the other employees in knowledge production (many-to-many communication). One of the topic coordinators made the following point: he called the new role "E-Collaboration animator" expressing the feeling that in future his expertise may not been seen as his valuable skill but will be replaced by the need to be an experienced moderator of online communities. This statement suggests that the new role of the "proactive knowledge provider" was unclear and not defined in an organisational context.

C. Barriers rooted in the technology

The technology itself, in our case the SharePoint® Server plus the implemented add-on applications such as a wiki, a search function and a forum software, worked quite well. The identified technical barriers were some constraints such as a cumbersome document upload function with many compulsory tags for classification, and the search function lacking a document preview. Low usability due to extensive menu structures and slow performance were also commented on by the members of the focus group. As most content was stored in documents, users could not make quick ad-hoc updates of the information, i.e. the documents had to be down and uploaded to be changed. The members of the focus group also stated that in some knowledge areas on the SharePoint® Server there were either too many documents or too few. To summarise, the intranet 2.0 was not seen as the primary source of knowledge; the users still preferred to search on the internet.

D. Discussion

It is interesting to note that in our case barriers rooted in the organisation itself and in the culture seemed to have a greater impact on the collaborative production of knowledge in the topic areas than the ones caused by low usability or low functionality of the software. Consequently, initiatives to facilitate adoption of social software, such as training, project marketing, working with key users, getting management to use the tools actively by themselves, are not sufficient. In interpreting these findings, we have to consider the previous research of Pan and Scarbrough [28] that was undertaken already two decades ago. They developed a theoretical model with three major layers that were required for technological innovations (in their case, a knowledge management system) to be successful: *Infrastructure* (the hardware/software that enables the physical/ communicational contact between network members),

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Infostructure (the formal rules, that govern the exchange between the participants in the network) and *Infoculture* (the stock of background knowledge that actors take for granted and that is embedded in the social relations surrounding work group processes). Pan and Scarborough called the latter also the cultural knowledge that defines constraints on knowledge and information sharing. Most importantly, their conclusion is that knowledge management systems *"…involve more than technology but rather a culture in which new roles and constructs are created. It changes the communication patterns between individuals and teams, and also alters the design of the organisation by fostering new processes and structures*" [28]. Interestingly, the three types of possible barriers we found in our case study seem to match in some way the three layers of Pan and Scarborough´s model. However, in our case (a social software based intranet) the effects of a technological innovation as stated by Pan and Scarborough could not be observed and there were no signs for alterations in the organisation. Consequently, it appears that the identified barriers rooted in the (knowledge) culture turned out to be the major constraints.

In addition, our findings support the view that all three types of barriers are intertwined and therefore influence each other. In particular, the organisation itself - in a sense the actual business processes and the organisational structure - is mirrored in the IT applications and the corresponding access rights. On the other hand, the organisation itself is effected by the norms, values and paradigms of an enterprise, thus reflecting the organisational culture. For example, in our case the most important single barrier was the lack of alignment of the intranet 2.0 applications to the business process requirements. The business processes were implemented in the form of internal rules and standards. Furthermore, the organisational culture of the financial service provider in our case study may be characterised as being traditional and hierarchical and dominated by compliance requirements. Therefore, the internal standards defined an accurate quality assurance process for documents, with several confirmation steps on management level built-in. Despite this, the topic coordinators were asked to generate knowledge collaboratively which indicated the requirement to publish not-confirmed content as well. This is a clear example of how the organisational culture determined by a traditional hierarchical work organisation (division of work, control and command) may influence adoption of E-Collaboration software via business process regulations.

These findings are also in accordance with our previous discussion about the "new spirit" in work organisations according to Boltanski and Chiapello [25]. As mentioned before, the new form of work organisation is replacing *efficiency,* the traditional measurement for employees and processes, with *activity*. From our perspective, *activity* in connection to knowledge production may be seen as an autonomous behavior of users, who act on their own initiative participating voluntarily and contributing interactively, as known from the production of user provided content on the public web. Hence, we presume that employees suffer from the ambiguity between the measurement of the quality of work in the "new spirit" [25] and the measurements in traditional structures. For instance, in our case study we observed the conflict situation of the topic coordinators: On the one hand, they were part of a hierarchical organisation, had to work efficiently (which was also implemented in the Management-by-Objectives), and were obliged to stick to the internal standards and rules. On the other hand, they were requested by the intranet 2.0 project to collaborate autonomously, initiatively and spontaneously. Above all, we tend to believe that the ambiguity between the new norm *activity* and the traditional value *efficiency* is the unspoken but nevertheless underlying cause of the unsatisfying usage of the intranet 2.0 platform in our case.

V. CONCLUSION

Research into participative knowledge generation utilizing social software, especially with a focus on the organisation and its people is in the early stages. The case study presented in this paper has pinpointed some specific drivers and drawbacks for intranet 2.0 based E-Collaboration. The latter have been grouped into three types of possible barriers, each type characterized by being embedded in the same context. More empirical data will need to be gathered to justify these types.

For practitioners, the quintessence of the present paper is that activities aiming to support intranet 2.0 initiatives, especially those with focus on the collaborative production of knowledge, have to consider all three types of possible barriers. Only optimizing the underlying (information) technology is not enough - the probability of failure of the whole initiative will still prevail. For instance, the organisation itself must be prepared to empower employees to use social software appropriately, e.g., by allocating sufficient time resources or adjusting the job descriptions. Daily routine activities, i.e. those to do with the business processes must be linked to the intranet 2.0 software to ensure the intended usage. All this must be considered against the background of the internal norms and values. An organisation holding on to a strictly hierarchal culture may be a limiting factor for any intranet 2.0 initiative.

On the whole we believe it is less meaningful to discuss if and how social software may or may not change organisations but to interpret the findings in a broader social science-based framework. Taking the work of Boltanski and Chiapello and their understanding of the new forms of work organisation into consideration, namely projects and networks, we believe that employees using social software for knowledge production struggle with the ambiguity between the demands of these new forms of work and the existing, traditional organisational structures. More research is needed to better understand the consequences of this development, especially how the discrepancy between traditional "tayloristic" organisations and the expected participation of the employees in the "Enterprise 2.0" may be bridged.

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