Knowledge exchange using Web 2.0 technologies in NGOs

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Abstract

**Purpose:** Members’ knowledge is the most important resource in NGOs and it is important to stimulate its exchange. Knowledge that is needed to act in complex situations is hard to exchange, but Web 2.0 technologies provide a toolbox to develop a knowledge management strategy. The paper aims to specify optimal conditions and necessary measures that NGOs should take in order to successfully use Web 2.0 technologies for knowledge exchange.

**Design/methodology/approach:** NGOs and Web 2.0 technologies have specific characteristics in common. It is suggested that these characteristics require certain prerequisites in order to make the use of Web 2.0 technologies successful. Using an iterative and participative design method, a case study is presented that investigated prior boundary conditions and implemented a Web 2.0 based platform as knowledge management strategy in a large NGO.

**Findings:** NGOs and Web 2.0 are based on strong voluntariness, they are democratic, contribution and personality are strongly tied to each other, and education is rarely formal. Therefore, there is a strong need for contact between members, internal motivation and organizational identification, for quality criteria, for protected spaces and pattern-structures, if Web 2.0 technologies shall lead to successful knowledge management. The case study demonstrates that considering these circumstances enabled the successful implementation in a large NGO.

**Practical implications:** The current research helps NGOs to successfully implement Web 2.0 technologies as a means to support knowledge management. A figure with the crucial questions and the means that have to be taken in dependence of the answers is provided.

**Originality:** NGOs do not have the same means to develop formal management strategies as other organizations. Therefore, a thorough understanding of the circumstances that enable knowledge exchange with Web 2.0 technologies is needed. The current research provides information about optimal circumstances and about possibilities how to improve less promising circumstances.
Keywords: knowledge exchange, computers, continuous learning, knowledge management
1. Introduction

Non Governmental Organizations (NGOs) differ from other organizations as they are not profit-oriented, but pursue charitable goals. They fulfill important social functions in society. Like other organizations, they are under pressure to use their financial and personal resources efficiently, and to improve their work constantly. As a consequence, it has been understood in recent years that NGOs – quite like state or profit-based organizations – need a formal knowledge management strategy to ensure sustainable and continuous success and to constantly adapt their work to changing conditions (Edwards, 1997). Compared to other organizations there are some special characteristics of NGOs that influence knowledge management. These characteristics make Web 2.0 technologies an ideal toolbox for NGOs to implement a knowledge management strategy. In the current paper, means and methods to implement Web 2.0 technologies in NGOs are derived from the literature and implemented in a case study. The research question is, under which circumstances the characteristics of Web 2.0 technologies facilitate knowledge management in NGOs and what means have to be taken to improve these circumstances.

In this article, first characteristics of NGOs and the need for knowledge management in such organizations are pointed out. Then, characteristics of Web 2.0 and their significance for knowledge management are specified. Section 5 focuses on conditions for the successful application of Web 2.0 in NGOs. In Section 6, a case study about the implementation of Web 2.0 platform for knowledge management in a large NGO in Germany is presented, where the conditions were tested and the necessary means implemented.

2. Characteristics of NGOs

The term NGO was formed at a United Nations conference in 1992, but is now also being used outside the UN context as a collective label for a variety of very different organizations. An internationally agreed definition of NGOs does not exist. Martens (2002) defines NGOs as “formal (professionalized) independent societal organizations whose primary aim is to promote common goals at the national or the international level” (p. 282). In order to be classified as an NGO under this definition, an organization has to possess some (minimal) organizational structure, its funding must be independent from the state, its staff must be qualified but not profit-oriented, should come from the private sector of society and work for common goals from which the public will benefit.
Despite the difficulty of finding a general definition for this very heterogenous type of organization, NGOs have features in common, which are not part of the formal definition. Four of these are particularly relevant in the context of knowledge exchange using Web 2.0 technologies:

*Voluntariness: The work of NGOs is frequently carried out by volunteers.* Many NGOs depend on the private commitment of these volunteers and need a minimum number of contributions from their rank and file in order to be able to carry out their work (Glagow, 1992).

*Participation: NGOs are democratic organizations based on participation.* Decisions are in many cases taken at a grassroot level, using democratic procedures (Brand, 2000). In contrast to many state or profit-based organization, NGOs have flat hierarchies. Differences of status, where they exist, are less formalized and thus more difficult to recognize than in other organizations. In addition, the success of NGOs is defined using criteria that may be hard to measure (e.g., its “good reputation”; Britton, 1998) and have therefore to be socially negotiated and assessed by the community.

*Personal Relevance: An individual’s voluntary contribution is closely tied to that individuals’ personality.* The high amount of voluntary work, but also the increasing rate of short-time contracts and unpaid overtime requires strong personal commitment, while providing little security. Therefore, to a greater extent than in formal contexts, the work done for the NGO is mingled with one’s individual’s personality. You are what you do – separating the assessment of a person’s work from the assessment of the individual is more difficult in the NGO context than elsewhere (Matschke and Arnold, 2010).

*Non-formalization: Training volunteers to build their knowledge is not formalized.* In contrast to formal training courses, as they exist for professionals, NGOs neither have any formalized training for what is required for their type of work, nor experienced trainers. NGO volunteers learn their knowledge through observation and are thus socialized into their responsibilities.

### 3. Knowledge Management in NGOs

For NGOs, the knowledge of their members is an important resource as it is needed to act in specific, complex situations. Members of NGOs frequently possess a treasure of personal experience, but rarely exchange their knowledge. So while one person is strug-
gling with a problem, another person in the organization may have solved precisely that problem a long time ago. In this paper the term knowledge exchange refers to the model of knowledge use in organizations (Kelloway and Barling, 2000) that describes four types of knowledge work: finding knowledge, creating knowledge, packaging knowledge and applying knowledge. Thus, the permanent exchange of knowledge between individuals, groups, and artifacts in an organization is an essential precondition for successful knowledge work and workplace learning (Eraut, 2000; Eraut and Hirsh, 2007). Following the knowledge creation model (Nonaka, 1994; Nonaka and Takeuchi, 1995; Nonaka and Toyama, 2003), the exchange of tacit knowledge between individuals takes place as a dynamic process of socialization (share experiences by observation and imitation), externalization (articulate tacit knowledge), combination (connect explicit knowledge) and internalization (internalize explicit knowledge).

Net-based tools for knowledge exchange have been introduced in order to facilitate this exchange of knowledge between members of an organization. Net-based tools provide staff members and volunteers with an opportunity to make their knowledge available to others and to retrieve relevant information. Under optimal conditions, the experience of other users will flow back into a shared platform, making a development of organizational knowledge possible.

The treasure of what an NGO knows not only consists of factual knowledge, but also of knowledge-in-use (De Jong and Ferguson-Hessler, 1996). The latter is a combination of factual knowledge and so-called procedural knowledge, i.e., knowledge on how to perform an activity. A person who has to handle complex situations will not only need some specific factual knowledge, but also some knowledge on how to do certain things in the best way. Knowledge-in-use on how to integrate new voluntary workers, for example, will consist of some factual knowledge (e.g., which tasks still need to be fulfilled in the organization) and some procedural knowledge (e.g., how to find out what new volunteers are capable of doing). Knowledge-in-use has become so ingrained by daily routine and practice that it is, in parts, often implicit knowledge. This tacit knowledge (Polanyi, 1966) can hardly be expressed verbally and exchanged with others without own experience. There is no need of conscious control of such activities any more. Those who possess and perform the knowledge-in-use often find it difficult to explain verbally, in other words to externalize to beginners what they are doing (Eraut, 2007). For example, while explaining how to integrate new volunteers in an NGO, an experienced person might say: “Just find out what they can do, and let them do it!”, but a be-
ginner would hardly be able to integrate a new person successfully by acting on the basis of such a guideline.

Taken together, there is an enormous amount of (partly tacit) knowledge in NGOs that is difficult to exchange, but which is nevertheless central to the NGOs development. A formal knowledge management strategy is therefore of major importance.

One of the main messages of this paper is that Web 2.0 technologies have various features in common with NGOs that have a strong potential of turning them into a successful instrument of knowledge management especially for NGOs. These features are described in the following.

4. Characteristics of Web 2.0 technologies

The term Web 2.0 implies the concept of a “participation-internet”, in which users are actively involved in the creation of content. They work jointly on wiki articles, write contributions for weblogs, discuss in online forums, create and publish pictures and videos. In contrast to other papers that focus on the corporate use of specific technologies like wikis (Moskaliuk & Kimmerle, 2010; Grace, 2009), blogs (Baehr and Alex-Brown, 2010; Lee et al., 2006) and online forums (Fayard and DeSanctis, 2005), the goal of the current case study is to emphasize the specific characteristics of Web 2.0 in general. These characteristics have led to a different handling of knowledge and information, in which the boundaries between content producers and consumers tend to disappear. Individuals may participate in the exchange and joint development of knowledge, and have access to a large knowledge base that is available. The following four characteristics of Web 2.0 technologies are particularly relevant to understand their potential for knowledge exchange within NGOs.

Voluntariness: Participation in Web 2.0 technologies is voluntary. Its users sometimes invest a very considerable proportion of their free time in preparing content, without ever getting any financial reward. The individual users not only decide whether they wish to participate, but also where, when and in which form. They are not tied to work schedules and assignments. As authors, they select topics on which they regard themselves as competent and wish to participate with their knowledge.

Participation: The functionality of the Web 2.0 is democratic, based on participation. There are no hierarchical structures to organize or prescribe the individual users’ partic-
ipation. Where such structures exist – for example, different administrator rights within Wikipedia the Online Encyclopedia –, they have emerged from within the community in the course of time, usually as a result of the commitment and competence of individual users. Such decisions are changeable and adapted to the current situation. This democratic organization of the Web 2.0 also influences the flow of information and the way in which knowledge is passed on. While in a newspaper, it is the team of editors who decide which content is published, it is the users of the Web 2.0 who decide which topics are relevant and which contributions are worthy of being recommended, commented on, or cited in one’s own contributions.

*Personal Relevance: An individual’s contribution is closely tied to that individuals’ personality.* Net-based communication works without many of the usual clues and indications of the other person’s state and status, so the content provided by one person is all the more important as a source of information on that person. User-generated contributions are a good opportunity for authors to present themselves and their personality through the Web. Readers may see from the choice of topics, the content and form of contributions what this particular author considers highly relevant personally.

*Non-formalization: Processes of writing and publishing in the Web 2.0 are not formalized.* Authors in the Web 2.0 are neither trained editors nor accredited anywhere. The technical barrier is usually very low, so a large quantity of content is available in the Web 2.0. The selection of what is of high quality and relevance is not made in a formal process, but by decision of the respective community, and through a process of constant adaptation. This absence of formalization makes it necessary, on the one hand, that users make their own critical assessment of the truth and relevance of content, but makes it possible, at the same time, that an exchange of knowledge is possible beyond established doctrines.

5. **Web 2.0 in NGOs: creating optimal conditions for successful applications**

NGOs and the Web 2.0 concept share some characteristics, which make Web 2.0 technologies particularly suitable for knowledge exchange within NGOs. Table 1 summarizes the similar characteristics of NGOs and Web 2.0 technologies and the boundary conditions that catalyze the positive effects of these characteristics.

| Characteristics of NGOS | Characteristics of Web 2.0 technologies | Boundary conditions for the successful use of Web 2.0 in NGOs |
Table 1. Characteristics of NGOs and Web 2.0 technologies the resulting boundary conditions that are necessary for the successful use of Web 2.0 technologies in NGOs.

However, at the same time, these characteristics of NGOs and Web 2.0 technologies lead to certain requirements to successfully utilize Web 2.0 technologies for knowledge exchange in NGOs. In the following, it is investigated what these requirements are and what means and methods can be taken in order to improve circumstances for the optimal implementation of Web 2.0 technologies for knowledge management in NGOs. Figure 1 provides a visualization of the described requirements and indicates crucial questions practitioners will have to ask themselves before the implementation of Web 2.0 technologies and summarizes the means that can be taken to complete and create optimal prior conditions.

5.1. Voluntariness requires contact between members, internal motivation, and identification

Practical experience has shown that an exchange of knowledge will not automatically occur on platforms that have been set up for this purpose. Information is read and used, but only few of the users make active contributions to such platforms and contribute their own knowledge. From the point of view of each individual user, the most effective strategy would be only to extract information from such a platform, but not to contribute anything. But in the worst case, this will lead to platforms with little or no updated content – a state which is negative also from the individual users’ point of view. Such a situation can be considered as a special case of a social dilemma, where uncooperative behavior carries the highest benefit for individuals, as long as others cooperate (Cress, 2006).
Passing on one’s own knowledge to others will take time and needs some effort (Reid et al., 1996). Bearing in mind that Web 2.0 technologies are “based on participation”, it is necessary that as many people as possible are involved actively. It has been found that certain forms of motivation will encourage active participation. Bonus systems, for example, increase the participating users’ readiness to provide their knowledge (Cress et al., 2006). It also helps to regard knowledge not only as something private, but also as a good that belongs to the organization, and explicitly to include the sharing of knowledge in a person’s job description (Cress, 2006; Cress and Kimmerle, 2007; Cress et al., 2003). But this type of motivation system is rarely available to NGOs. On the one hand, their resources are very limited, leaving little scope for bonus systems. On the other hand, as a result of the high number of volunteers in NGOs, their organizational knowledge exists in the heads of many people, who are under no obligation whatsoever to share that knowledge. While it may explicitly be demanded of employees that they share their knowledge, the active participation of volunteers in some form of knowledge exchange requires additional commitment from their side.

There are, however, facilitators for active knowledge exchange with databases that are also available to NGOs, or even specifically to NGOs. A person who is genuinely interested in some topic, will obviously be prepared to participate in knowledge exchange on that topic. Thus, internal motivation is a strong predictor for contributions in knowledge exchange (Kimmerle, 2006). It has also been found that so-called meta-knowledge facilitates contribution of information. People’s readiness to invest time and effort in passing on knowledge will be greater if they know who the others are, what the others know and which information they really need. The information passed on will not only be greater in quantity, but also of more value to the others (Cress et al., 2006). A high degree of interpersonal trust in others also has a positive influence on people’s readiness to pass on information (De Cremer et al., 2001; Kimmerle et al., 2006). The same applies to identification with the organization. If people identify with the group, they see themselves as group members and thus make the interests of the group their own (Tajfel and Turner, 1986). If such an identification exists, members of the organization regard knowledge no longer as “mine” but “ours”, and learning and success are not only valued by what the individual has achieved, but by the learning progress and success of the organization as a whole. For identified members, it is in their personal interest to improve the organization by passing on their own knowledge.
Thus, before implementing Web 2.0 technologies for knowledge management, NGOs will have to investigate whether members are high internally motivated, have strong meta-knowledge, interpersonal trust and are strongly identified (see Figure 1). As far as genuine interest in a topic is concerned, any NGO clearly has an advantage over other organizations, in that the involvement of volunteers in this type of organization is based on some strong internal motivation and strong interest in its topics. What the NGO needs to build actively is meta-knowledge, interpersonal trust and identification.

In order to build meta-knowledge and interpersonal trust on a long-term basis, personal meetings, easy contacting possibilities, a high degree of accessibility and room for informal exchange are essential. Personal acquaintance is the glue that keeps people together within an organization, especially at the beginning, later through identification with the organization (Eisenbeiss, 2004; Prentice et al., 1994). In addition, meta-knowledge may be increased by using social networking tools. Knowledge cards that make bearers and sources of knowledge explicit within a platform will be able to increase meta-knowledge within organizations.

Building identification with a new NGO is a complex process that may be strengthened or weakened by various factors. Strong internal motivation is a helpful factor here as well. It has been shown that, even before they join the organization, people high in internal motivation to enter the group identify anticipatory and show their commitment prior to the actual group membership (Amiot et al., 2007; Sassenberg and Matschke, 2010). An additional advantage is that high internally motivated people do not give up their commitment easily when confronted with negative feedback or rejection, but maintain their identification with the group (Matschke and Sassenberg, 2010b). NGOs, with a high percentage of high internally motivated volunteers in their ranks, have therefore optimal conditions to recruit and keep identified members.

Identification that existed prior to joining the organization is intensified by contact with other fellow workers after joining (Sassenberg and Matschke, 2010). It has been shown that so-called approach strategies of newcomers who join the organization are more helpful than so-called avoidance strategies. Approach strategies are a focus on strategies that support integration into the group, while avoidance are a focus on strategies that avoid such forms of behaviour that might put integration at risk. Upon joining an environmental NGO, for instance, newcomers could use public transport to attend activities (an approach strategy), and not drop trash in the countryside (an avoidance strategy). It
was demonstrated that approach strategies facilitate long-term identification with a new group (Matschke and Sassenberg, 2010a) and lead to greater sensitivity to positive feedback from the group: People who use approach strategies when joining an organization respond to acceptance by other members with particularly high identification. Avoidance strategies, on the other hand, increase sensitivity to rejection. People pursuing avoidance strategies while joining an organization would tend to give up faster after a negative experience, i.e., rather leave the organization (Matschke and Sassenberg, in press; Matschke and Sassenberg, 2010b). It is therefore advisable for NGOs to encourage new volunteers to use approach strategies as far as possible. Pessimism would be inappropriate in the early stage of affiliation to the NGO. Emphasizing positive aspects by looking at things through rose-colored glasses is ideal in the initial stage, in order to build effective identification.

5.2. Democratic participation processes need quality criteria

The absence of editors and the democratic nature of processes in the Web 2.0 make it possible to exchange knowledge beyond the boundaries set by hierarchies. This makes it possible – especially for NGOs, which are used to flat hierarchies –, to utilize the knowledge of staff and volunteers, and to jointly develop innovative ideas further. But this contains the risk, at the same time, that the quality of content provided by these users is insufficient or, at worst, incompatible with the aims and values of the organization. If such information is freely available on the Web, vandalism or spam may occur – some individuals may falsify or delete existing content or irritate other users by writing senseless or provocative contributions. Another problem is that a net-based exchange of knowledge implies a certain amount of uncertainty from the individual users’ point of view. They have to judge for themselves to what extent their own knowledge is valuable and useful to others and worth sharing. Moreover, they do not know whether and to what extent other members of the NGO will participate in a mutual exchange, and this may result in fears of being exploited by the others.

Thus, NGOs will have to ask themselves whether members have a strong awareness about the worth of their knowledge, and whether there is the danger of vandalism, misuse or bad quality (see Figure 1). If the former is not the case and the latter the case, it is therefore helpful to define rules and norms on which an assessment of the quality of contributions is based. These might consist, on the one hand, of explicit guidelines describing which content is relevant, and the best possible ways in which users may par-
ticipate. On the other hand, implicit norms may be established by quoting examples which are particularly worth reading or relevant. The acceptance of such guidelines within the community will be higher if the users themselves set up and update these guidelines.

If, on top of that, the activity of other members is transparent, it will be possible to assess the extent to which other users participate and which knowledge they share (Cress and Kimmerle, 2007). This will reduce uncertainty and influence the individual users’ motivation to make an active contribution positively. Evaluation systems may also enhance motivation and improve the quality of contributions. Users might, for example, assign stars to each contribution to assess its quality, or express their appreciation for a good contribution by a “like”-button. To prevent vandalism or spam, each page should carry a link for reporting questionable content or users to the administrators, who may block such users or delete such content.

5.3. The entanglement between contributions and the contributor’s personality requires protected spaces

Separating the assessment of individuals and their work is more difficult in NGOs than in other organizations. In the context of Web 2.0-based knowledge exchange, this factor should not be underestimated in its deterring, but also its motivating potential. Fear of “losing one’s face” may strongly prevent people from participating actively in knowledge exchange. This fear is even stronger in NGOs because it is difficult to separate individuals and their personality from their activities. Under such circumstances, losing one’s face is not only a loss of perceived competence, but also a form of negative personal feedback and thus feelings can easily be hurt. On the other hand, linking a person to the work done by him or her, makes the opposite possible: if that person does a good job, not only his or her work will enjoy higher prestige, but also that person will become more popular socially. NGOs using Web 2.0 technologies have to be aware of both sides, the fears and the potential, and take appropriate measures.

Thus, NGOs will have to investigate whether gain of prestige is a powerful motivator in the organization. If this is the case, it is necessary to know whether members have a strong fear of losing face and personal feedback (see Figure 1). If yes, anonymity on platforms is one way of reducing the fear of losing face and of personal feedback. It has been demonstrated that anonymity leads to greater adaptation to norm and rules, but
only by members with a high degree of identification (Reicher et al., 1995). So if an NGO has a strong norm that knowledge should be shared, and many members are highly identified, the use of Web 2.0 technologies would benefit from anonymity. Anonymity will, on the other hand, increase the risk of free-riding: people with a lesser degree of identification would not share their own information, but still use the available information for their own benefit. Other disadvantages include the danger of vandalism or misuse of the platform, say, for bullying or stalking. Another disadvantage of anonymity is, that it undermines the opportunity of gaining prestige by sharing one’s information. If contributions are identifiable as those of one individual, individuals contribute stronger in knowledge exchange with shared databases (Cress and Kimmerle, 2008).

So how may the NGO handle people’s fears of losing their face, without suffering the disadvantages of anonymity?

If members are identified with the NGO, it is crucial to know whether there are positive norms about fairness and knowledge exchange (see Figure 1). Such norms support the cooperation in knowledge exchange and as long as refined mechanisms against vandalism exist, the risk of anonymity in NGOs is low. An alternative to anonymity may consist of protected spaces or the use of pseudonyms, which allow individuals to make individualized contributions despite uncertainty. Pseudonyms will allow the author of contributions to gain some prestige. It is up to the individual author to decide to whom the secret of the pseudonym is disclosed. The disadvantage of pseudonyms is that metaknowledge is more difficult to build. A co-worker whose real name is unknown cannot be approached informally, nor asked questions or involved in personal discussion. In the absence of such personal and informal mechanisms of knowledge exchange, development of this knowledge is exclusively restricted to the shared platform.

Offering protected spaces is another way of adapting the system to individual needs of the members. This is technically more sophisticated, but allows individuals to decide which contributions they wish to share with whom. Under circumstances in which a person and his/her achievements are closely associated with each other, users may wish to have such protected spaces in order to be able, say, to discuss a contribution which is not yet fit for publication with persons whom they trust (Matschke and Arnold, 2010). The danger of protected spaces lies in their potential misuse. One possible side-effect is their use for other purposes than knowledge exchange – for example, for sharing photos of the last excursion. This might turn out to be a two-edged sword, and NGOs will have to ask themselves whether so-called “off-topic” activities are tolerated (see Figure 1)
These activities will not immediately contribute to an exchange and gain of knowledge within the organization, but they will motivate those involved, make it easier for them to get to know each other, and this will stimulate knowledge exchange between them. NGOs will have to assess if the advantages of protected spaces prevail over their dangers in the NGO context. But generally the danger of misusing protected spaces is smaller in a community of internally motivated people with a high degree of identification with the organization, as can be found in most NGOs.

5.4. Non-formalization needs pattern to provide some structure

Exchanging knowledge-in-use is by no means easy. Much of this knowledge concerns activities that are carried out automatically, so it is difficult to describe it and pass it on to others in a written form. Readers of such descriptions will then have to transfer what they have read, and adapt it to their own situation. This may involve some misunderstanding, because a description may be incomplete or too complicated, or because important conditions have not been named clearly. It may also be difficult to achieve a sufficient degree of abstraction, because common standards to describe knowledge-in-use do not exist. If instructions or procedures are described in too concrete terms, reflection on the aims and significance of one’s own activity – which is an important target of knowledge management –, may be lost sight of. Descriptions which are too abstract and theoretical may not be applicable in other contexts. It may also be difficult to transfer such descriptions of knowledge-in-use if the experience and prior knowledge of its readers are very different. What is missing here is a common language that allows an exchange and development of knowledge-in-use between authors and readers. Such problems are intensified in NGOs by the absence of formal training, by considerable local and regional differences and the individuality of knowledge-in-use that exists more strongly in NGOs than in other organizations.

If NGOs decide to foster the exchange of knowledge-in-use despite these difficulties, they have to know whether there are strong differences in prior knowledge, such as training, context, regional differences or experiences (see Figure 1). If that is the case, the exchange of knowledge-in-use can be supported by the use of so-called patterns (Wodzicki et al., 2011). Patterns are structured descriptions of solutions that have proven useful. These descriptions make the association between problem, solution and appropriate situation for applications explicit. The prior structure (e.g., “challenge“, “forces“, or “solution“) stimulates reflection and abstraction of experiences. By making ex-
plicit the relationship between a problem that needs to be solved, the idea of its solution, and a precise description of the procedure adopted, it is easier to describe one’s own experience and the knowledge-in-use in such a way that it is both complete and comprehensible to readers (Arnold et al., 2010). The specific context or situation in which a solution was successful is described as accurately as possible. This makes it easier to identify the framework and conditions of successful implementation and thus increases the likelihood of a successful adaptation of the knowledge-in-use by readers.

If the Web 2.0 concept is applied while using patterns for the exchange of knowledge-in-use, one important requirement should be borne in mind to apply them with success. Patterns should have been set up (and further developed) by the community in a joint effort. If it was only a group of experts that set up the pattern and provides them in the form of an instruction, members of the organization are not likely to be motivated to participate in its further development by providing their own experience. Moreover, structures may not reflect a language that can be understood by novices. As many members as possible should be involved in the process of setting up and developing patterns, thus sharing their own experience. Patterns will then support the net-based exchange of knowledge-in-use and its further development as a joint effort. Patterns thus help to find an abstract form for knowledge-in-use and to externalize it in writing, by providing a common structure.

6. Case Study: A Pattern-Based Knowledge Management Platform for the Protestant Church in Germany

The team of the cooperation project “Patterns and Tools for Non-Governmental Organizations”, consisting of the Knowledge Media Research Center, the Evangelische Kirche in Deutschland (EKD, Protestant Church in Germany) and FernUniversität Hagen (Distance Teaching University), developed and implemented a knowledge management platform for all active members of the EKD. An iterative and participative design method was applied, where the characteristics of the NGO and boundary conditions were investigated. According to the approach introduced in Figure 1, means were taken in order to improve the conditions for the successful use of Web 2.0 technologies for knowledge exchange in the NGO. Finally, the platform was implemented and the characteristics of the community were measured 10 month after the launch in order to test whether the desired outcomes were reached. Table 2 summarizes the results.
The EKD is an NGO based on democratic and bottom-up-structures of decision-making with about 250,000 full-time staff members and about one million volunteers. For the volunteers, there are few formalized trainings and volunteers’ contributions are highly tied to their personality. Thus, the organization possesses the typical characteristics of NGOs.

The new platform provides a protected workspace for employees and volunteers of the EKD, with selected parts of the content available through the public Internet. The platform consists of three main areas named “idea space”, “experience space” and “knowledge space”.

The idea space is similar to a forum: users may initiate a certain topic by posting questions or ideas, and the discussions on single topics are threaded. At the end of a discussion, users are asked to write a conclusion, so that every discussion is available both in the complete and summarized form in the long run to the community. In the experience space, users describe specific and individual experiences that have stood the test of practice. These reports are tied to a specific context and in many cases to local characteristics or circumstances. Basically based on a content management system where authors provide their individual experiences and additional material, this space uses Web 2.0 technologies by providing readers the opportunity to comment and rate articles. The knowledge space establishes a common pool of knowledge-in-use in more abstract terms. Based on wiki-technology, all users of the platform may write and edit the entries (text and materials) in the knowledge space. Moreover, articles can again be commented and rated by all users. While articles in the experience space describe single projects or situations, the knowledge space consists of abstracted knowledge to an organizational collection of knowledge-in-use. The platform supports transmissions between the spaces: articles and forum entries are strongly interlinked, if they address a common topic, and users are repeatedly asked to transfer their discussions or experience reports in the respective more abstract experience or knowledge space. Thus, knowledge maturing from the expression of quick ideas to a more formalized pool of abstract knowledge is enabled and encouraged.

The conception of this platform differs from other formal knowledge management systems as it is more than a web-based content management system: by the use of Web 2.0 concepts like Wikis and Social Networking, knowledge exchange is much more collaborative, allows for a further collaborative development of knowledge and establishes a
knowledge building community. In the first 10 months after the launch of the platform, more than 2000 users registered to the community. Of these users, around 10% are actively contributing content, a number that might seem small, but exceeds the usual number of active users in knowledge exchange platforms (e.g., in the Wikipedia). These users have produced around 230 articles in the knowledge space, more than 300 experience reports and more than 100 discussions. Retrievals around 240,000 per month demonstrate that there is a large community of (unregistered) readers that use the platform in order to retrieve information. The implementation of the platform has, as far as possible, followed the principles of successful use of Web 2.0 concepts for knowledge management in NGOs described above. In what follows, it is described how these principles were implemented.

6.1 Voluntariness: Supporting contact between members, internal motivation, and identification

It was expected that in NGOs, members are highly internally motivated to get engaged in knowledge exchange and identify strongly with the organization. In several focus groups, members of the EKD expressed a strong wish to engage in knowledge exchange, because they hardly engage in knowledge exchange beyond a certain circle of colleagues and friends. The EKD members were enthusiastic about the implementation of a knowledge-exchange platform. In an online survey where 411 members of the EKD took part (169 female, 239 male, 3 missing; 238 staff members, 164 volunteers, 9 missing; age $M = 45$ years, $SD = 13$ years), participants were strongly interested in the platform (on a scale ranging from 1 = low to 6 = high, $M = 5.25$, $SD = 1.56$). Among these participants, organizational identification was, as expected, very high ($M = 6.25$, $SD = 1.18$).

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<th>NGO: EKD</th>
<th>Boundary conditions</th>
<th>Means to improve conditions</th>
<th>Characteristics of the community after implementation</th>
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<tbody>
<tr>
<td>About 1 Million volunteers</td>
<td>- Little contact beyond local friends and colleagues</td>
<td>- Personal meetings - Professional profiles - Groups</td>
<td>- High interpersonal trust ($M=4.46$, $SD=1.29$), - High expectation of cooperation ($M=4.79$, $SD=1.69$),</td>
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<td></td>
<td>Moderate meta-knowledge</td>
<td>- Moderate internal motivation to actively contribute knowledge</td>
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<td>((M=3.20, SD=1.65))</td>
<td>((M=3.59, SD=2.05))</td>
<td></td>
</tr>
<tr>
<td>High internal motivation to engage in</td>
<td>Not necessary</td>
<td>Moderate identification with the community ((M=3.32, SD=1.95))</td>
<td></td>
</tr>
<tr>
<td>knowledge exchange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>((M=5.25, SD=1.56))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High organizational</td>
<td>Not necessary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>identification</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>((M=6.25, SD=1.18))</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decision making based on democratic,</td>
<td>- Insecurity about quality criteria on contributions</td>
<td>Users perceive:</td>
<td></td>
</tr>
<tr>
<td>bottom-up procedures</td>
<td>- Strong fear of misuse and vandalism</td>
<td>- evaluations as just ((M=4.47, SD=2.07)),</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- quality as high ((M=4.68, SD=1.75)).</td>
<td></td>
</tr>
<tr>
<td>Strong ties between personality and</td>
<td>- Low fear of losing face ((M=2.98, SD=2.00))</td>
<td>- No experiences of vandalism and hardly any misuse</td>
<td></td>
</tr>
<tr>
<td>members’ contributions</td>
<td>- of personal feedback ((M=2.15, SD=1.60))</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Protected spaces</td>
<td>Considerable contributions:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Registration with real names</td>
<td>- more than 230 articles,</td>
<td></td>
</tr>
<tr>
<td>Unformalized training of members</td>
<td>- Use of patterns</td>
<td>- more than 300 experience reports</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Strong differences in experiences and prior</td>
<td>- more than 100 discussions with the majority made public</td>
<td></td>
</tr>
<tr>
<td></td>
<td>knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Users evaluate patterns as useful and understandable:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- knowledge space: (M=4.65, SD=1.81)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- experience space: (M=4.89, SD=1.47)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Users think that the platform is useful ((M=4.55, SD=1.87))</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>and put the information into practice ((M=3.61, SD=2.13))</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Results of the case study.

In order to promote interpersonal trust and meta-knowledge, personal meetings between community-members were arranged. In these meetings, users work together on articles, discuss their daily good practices and provide feedback. Besides these face-to-face meetings, the platform itself facilitates communication and coordination between users by providing an opportunity to fill in professional profiles. Similar to Social Networking Sites (e.g., Xing, facebook), every registered user can provide contact data, the professional affiliation, topics of expertise and some personal information. Through these profiles, it is possible to create a list of contact to other users. Users may then send each
other messages through the internal mailing system without betraying their e-mail addresses, and may choose to share information with their contacts only. Moreover, users have the possibility to create groups of people who are interested in the same topic or regional groups. Every group can create its own profile, articles and experience reports, discussions and favourites. The profiles and groups make it easy to find users with similar experiences and interests. Around 14 % of the registered users have filled in their professional profiles, and in the first three month where group creation was possible, 26 theme-based groups were created, besides a number of regional groups.

There is first evidence that these implementations might contribute to growing meta-knowledge and interpersonal trust. The authors conducted a second survey 8 months after the launch of the platform. 128 registered users participated (43 female, 83 male, 2 missing; 66 employed staff, 60 volunteers, 2 missing; mean age category 41-50 years). As expected, high levels of interpersonal trust (on a scale from 1 = low to 7 = high their interpersonal trust was $M = 4.46, SD = 1.29$) were found as well as high expectations of cooperative behaviour of other users ($M = 4.79, SD = 1.69$) and medium levels of meta-knowledge ($M = 3.20, SD = 1.65$), which is good news in the light that most users did not know each other personally. There are no data on the internal motivation to use the platform in the second survey, but the moderate internal motivation to actively contribute knowledge ($M = 3.59, SD = 2.05$) is high in the light of the effort that has to be taken. Similarly, the moderate identification with the community ($M = 3.32, SD = 1.95$) is promising for a new community. In order to make causal interpretations of this data, however, future implementations of similar platforms should measure these characteristics before and after the implementation and use a control-group.

Due to the high level of prior identification and internal motivation, the facilitation of approach strategies and the repression of avoidance strategies was not implemented in the platform. However, an example demonstrates how this could be implemented in a NGO:

New members of a wiki are greeted on a welcome page. A positive description of the group and of an “ideal” member encourages newcomers to regard it as an enjoyable experience to behave in the same way. The page contains a short description of those characteristics which are valued positively, and the terms on which success is defined. At this stage, as little attraction as possible is drawn to so-called “taboos”, i.e., new participants will not deal with breaches of rules, violations of norms, or negative examples, as long as they have no solid identification with the organization.
6.2. Participation: quality criteria

In several focus groups, members of the EKD indeed expressed that the democratic principles of Web 2.0 would increase their uncertainty about quality criteria of the content. There was also a strong fear of vandalism or misuse of the platform. In order to decrease these uncertainties, the platform uses an implicit communication of quality standards: excellent articles are recommended at the start pages of the platform, users have the possibility to evaluate articles with 1 to 5 stars (see Figure 2) and annotate articles. Thus, users can derive what kind of content is considered high quality and adapt their own contributions to that standard. Apparently, these measures are working well, as participants in the second user survey find the evaluation procedures just ($M = 4.47$, $SD = 2.07$) and indicate that the quality of the content is high ($M = 4.68$, $SD = 1.75$). In order to prevent vandalism or content that is not in line with the EKD, every page contains a link where articles can be denounced to the administrator. So far, there has been no vandalism on the platform, and misuse of the platform for other purposes than knowledge exchange (e.g., advertisement of print media) are rare and quickly eliminated by the administrators.

--insert Figure 2 about here--

Due to the organizational culture, the EKD did not want to provide explicit quality criteria. However, the following example illustrates how this could be done:

On the starting page of the wiki, its handling is explained, and users are informed how participation is possible. There is a short description entitled: “How to write an interesting article”. This manual was compiled jointly during a workshop with interested users. In addition, there are some links to pages which are particularly worth reading.

6.3. Personal Relevance: protected spaces

In the focus groups, fear of losing face and fear of personal feedback were named as strong barriers in a Web 2.0 knowledge exchange platform. On the other hand, gain of prestige was given as a strong motivator. In order to enable gain of prestige, the EKD decided against anonymity or even pseudonymity, so that users register with their real names. They can, however, choose to show their articles to their contacts only. Thus, a protected space is given to those who do not wish to expose their unfinished products to the public. So far, no case of misuse of this function is known, and many users chose to share their articles with the whole community or even make them public to the internet.
Indeed, as the second user survey indicates, fear of losing face ($M = 2.98$, $SD = 2.00$) and fear of personal feedback ($M = 2.15$, $SD = 1.60$) are low in the community.

If an NGO wants to offer pseudonymity to users, it might be done in the following way:

Working jointly on a shared wiki is only possible if all contributors have registered with their real names and been granted full access. But, in addition, they are free to select a pseudonym and decide for themselves which of their contributions – for example, criticism, discussion or questions – may be seen by other users under which name. Through the user pages of a wiki, its users may send messages to each other without disclosing their mail address to the community.

6.4. Non-formalization: Supporting knowledge exchange with patterns

Reports in the experience space and articles in the knowledge space use a pattern format to collect knowledge-in-use. The format contains the classical structure, but partly adapts the wording to the community: reasons and challenge (problem), idea (solution), situation (context), forces, and implementation. Some additional fields like target group, resources required or time needed are offered together with short description for every discussion, experience report and article in order to make a first impression easier and to interlink articles (see Figure 2 for an example of a “business card” of an article). In the edit mode of an article, an interface similar to a word processor is presented where the headlines of the pattern are given with input fields each (see Figure 3). First experiences with the pattern are positive, though the community is not used to them and beginners report difficulties to use the format for all of their experiences. Readers, however, find the format helpful to retrieve information. In comparison to open-formatted descriptions, patterns were more understandable and less controversial (Arnold et al., 2010).

After the first months, the pattern structure was changed according to the feedback of the users, thus using a community-based development of the structure. In the second user survey, users evaluate the structure of experience reports ($M = 4.89$, $SD = 1.47$) and articles in the knowledge space ($M = 4.65$, $SD = 1.81$) as useful and understandable. By the use of patterns, it is easy to adapt the knowledge to one’s own situation. Users think that the platform is useful in their work ($M = 4.55$, $SD = 1.87$) and indicate a surprisingly high level of having used the information in their daily work already ($M = 3.61$, $SD = 2.13$). After having made similar experiences, patterns can easily be adapted, expanded
or discussed with other community members. Ideally, in the long run, the use of patterns in the community might, for instance, look like this:

A voluntary worker describes a fund-raising activity at a local wine festival, where it has been possible to raise a considerable amount of donations. The pattern of the description helps to specify the context of this activity, including the information that it was a traditional festival in a small town. Another voluntary worker from a larger city takes up the idea, adapted to her own situation. Her experience with this type of fund-raising are later added to the description in the platform.

7. Summary

Web 2.0 technologies have several characteristics that make them particularly suitable for knowledge exchange in NGOs. Like NGOs, they are based on voluntary participation, use democratic participation principles, link individual contribution closely with personality, and handle knowledge and information in a non-formalized way. The presented research investigated the necessary prior conditions for a successful implementation of Web 2.0 technologies for knowledge management in NGOs. While other organizations can use mechanisms that force or motivate members to share their knowledge, NGOs have to create optimal conditions for the use of knowledge management tools. It was argued that the high degree of voluntariness requires personal contact and a strong identification with the organization. Democratic participation processes will only work on the basis of well-established quality criteria and their implementation. If the own work is of high personal relevance and individual’s personality and contribution are closely tied to each other, it is necessary to provide an opportunity for publication under pseudonyms or in a protected space. Problems arising from non-formalization may be handled by using patterns. A case-study investigated the prior conditions, used means to improve these and successfully applied Web 2.0 technologies for knowledge management in one of the largest NGOs in Germany.

The requirements identified in this paper may help other NGOs to implement Web 2.0 technologies for knowledge management. If attention is paid to these requirements, Web 2.0 technologies are an important toolbox for knowledge management in NGOs.
References


