Free Tools for Project Management: An Organizational Learning Approach for Small and Medium-Sized Enterprises

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Abstract — Small and medium-sized enterprises (SMEs) must increasingly deal with international projects as well as distributed and virtual teams. Highly sophisticated commercial project management software concurs with easy-to-install and open source tools. Particularly SMEs with their limited human resources face the challenge to find a tool that fits the specific project need. To serve the practitioners with a smarter and favorable project management, the research project InteComp SME 2.0 has created “KMUT – Platform for Project Management”. The free platform provides a structured overview about single and multi-purpose software tools, video guides and templates as well as information about additional regional training for project management. The vision is to create a growing project management community for SMEs.

On a more abstract level, the research project now faces the transition of the platform from offering pure information to encouraging organizational learning within community creation. In practice, the research project deals with the implementation of the presented tools. We want to design a scenario which integrates the tools in the daily work of project managers in SMEs. For this purpose, the following questions must be considered: (1) How can the KMUT platform contribute to a higher business value for the project management outcome in SME and what kind of employees already use social media for this purpose? (2) Which scenario guides the KMUT platform for collaborative organizational learning? To answer these questions a study of social media use is presented. A reflection of the practical implementation of the platform as a theoretical scenario analysis is carried out. Additionally, organizational learning theory under the aspect of communities of practice is integrated.

Index Terms—Open Source, Organizational Learning, Project Management, SME, Toolbox

I. INTRODUCTION

Changing organizations is a tightrope act, because internal and external requirements, both of them complex enough on their own, must be balanced and integrated [20]. The research on this topic relates to the fields of organizational development, innovation management and organizational learning, which provides a large number of theoretical concepts. Systematic approaches to these concepts can be found among others in Müller-Stewens and Pautzke [19], Dodgson [10], Blackler [7] and Klimecki and Thomae [17]. Over the past twenty years business processes have emerged as organizational design objects [14]. In a current research and practice, this is seen as a lasting and comprehensive design and management task that takes place in all forms of organizational change whether in the context of a project or in the context of business operations [22].

Similarly, organizational learning and change processes must be mastered as design and management tasks. There is not a unified theory for organizational learning, which regards organizations as a subject as opposed to individual learning [12]. In our work, we agree with the basic assumption that organizations can learn the same as individuals. But a simple equation of these processes would be a too simplistic view (ibid.). Current research seeks, inter alia by the transfer of group dynamics approaches [26], to adapt learning concepts to organizations. In summary, organizational learning presents a process of use, modification and development of an organizational value and knowledge base, improvement in problem-solving and empowerment as well as the change of the reference framework by and for members in the organization [12, 21]. Learning cultures indicate insights how organizational learning [1] is lived. They mirror the importance of learning in the company, by the way of learning, and the support for the further development of learning culture [21]. As site-specific (including virtual) environments learning culture express the reality of learning that unfolds through learning activities of employees [13].

Social media have become a major part of private life and business. For learning and knowledge management, e-learning and social learning tools have been used for years. In other areas like project management, it is still common practice to use specialized software to manage all tasks, but social media is becoming more popular [16]. For small and medium-sized enterprises (SMEs) commercial business software is often oversized [21]. They need project management software that quickly and productively fits their needs, without extensive time-consuming software configurations. Project participants are only able to work together if they have access to the software. This is especially important if they work in different units or different companies with different technical equipment and background. Especially in distributed, international and virtual teams, the quality of communication and collaboration is a critical factor for the success of the projects. Bernoff and Schadler [2] coined the term HERO (“Highly Empowered and Resourceful Operative”). A HERO is an employee who is visibly
ahead of the crowd with regard to his use of social media. According to the authors, these “heroes” have a very high interest in the use of social media, and they are able and willing to deploy this self-acquired media competence profitably in the company. Taking this fact into account, open source software and social media tools of the KMUT platform could fill a gap between the oversized software on the one hand and the automatic, ubiquitous use of Microsoft Excel as the only solution on the other hand.

II. METHODS

To answer the above mentioned questions we chose different methodologies that have been adapted to our problems setting:

a. Social Media Study
b. Scenario Analysis

A. Social Media Study

The social media study is part of a broader study of the research project Intercomp SME 2.0. This quantitative analysis is embedded in a preceded qualitative interview study, where project managers of different SMEs have been asked about their use of software and tools for project management. Parts of the qualitative interviews have been shown [5] in the context of the storytelling method. The social media study had a focus on the private user behavior of social media tools. In this quantitative test 108 interviewees of different companies have been asked about their social media user behavior during two months (03/2012 – 04/2012). Partner of this survey was the German Chamber of Industry and Commerce and the Technology Foundation Berlin. This offered the access to a representative sample of small and medium sized German companies. To get not just those already active in social media environments (like Twitter, Xing, LinkedIn) the research team decided to use the distribution channel “e-mail newsletter” to reach the target group. Concerning the contents the comprehension of the term “social media” was used intentionally wide. The aim of this intention was to leave room for the participants’ own interpretation of the term “social media”. The questionnaire included nine closed questions (classification) with a subsequent part for the evaluation of relevant participant information.

4,500 email newsletters were sent out. Bosnjaks [8] classification scheme following 108 complete responders answered the complete online survey. Complete responders are fully completed questionnaire forms, and therefore from a statistical point of view applicable answers. This survey reached a response rate of 2.3%. The drop out rate corresponds to approximately 1%, i.e. the ones who started the questionnaire without completing it. The online questionnaire was technically realized with the open source content management system “Contao” [11]. A pre-test was conducted in advance to modify and optimize the main survey. The following data were analyzed by descriptive and analytical statistic by use of the software SPSS. Group differences were tested by variance analysis, coherences via correlations with a general probability of error by α = 0.05. The significance level was proofed two-tiered. This study has the character of a meta-study.

The first investigation was undertaken to find out how the private and business social media use of the individual participant is allocated and corresponds to each other (participant analysis). This quantitative questionnaire had a look at the personal behavior of an individual employee instead of the social media activities of a company or a

![Image](http://www.kmut-projektmanagement.de)
whole organization. The research investigates how private and business behavior of social media use relates to each other. The individual explores social media tools in his or her private environment and builds up a media competence before he gets into the company. The second line of investigation of the study was to find out how useful social media is seen in the business and in which workplace areas social media should be used more or less.

B. Scenario Analysis

To develop a framework of possible organizational workplace learning scenarios for the implementation of KMUT tools, the method of scenario analysis was used [24]. The implementation scenarios have been designed in the following four steps (fig 2).

![Figure 2. Design of the implementation scenarios [23]](image)

(B.1) Determine: How were the dimensions evaluated?

In the first step different dimensions for the scenario were evaluated regarding the future development of project management and organizational learning.

(B.2) Select: Why did we choose these scenarios?

Next, two main scenarios were selected, describing the evolution of the current state of KMUT toolbox toward the desired organizational learning scenario.

(B.3) Describe: In what daily workplace situation could our project manager be in the desired scenario?

To put a focus on the real need of project manager a user story is extracted from a qualitative business survey from Quade, Birkenkrahe and Habermann [4]. The method [9] was adapted for describing the selected scenario with the following syntax

As a <role>, I want <goal/desire> so that <benefit>

(B.4) Operationalize: How do we implement the scenario path?

The stakeholders in the change process should be involved from the beginning in the design process in order to align their attitudes and behavior to the change in target. The development of a subsequent learning culture model was developed in close cooperation between research and the German Telekom AG [25] and is therefore particularly suitable for transfer to SMEs. Seufrert et al. modified the model to the following process model:

1. Initiation: Definition of change design and clarification of the change target
2. Diagnosis: Actual analysis of the learning culture performance
3. Positioning: Interpretation of results and setting priorities
4. Interventions: Design guidelines for implementation
5. Reflection: Accompaniment of the change management culture

III. RESULTS

The following chapter presents the results of the precedent survey (2A) and the scenario analysis (2B) of the research project up to the actual point of development of the project management toolbox to answer the initial research questions.

A. Social Media Study

The quantitative social media survey takes up this issue of special user types and delivers more answers; if and how the private user habits influences the use of social media tools in a business context. In the case of our investigation, 61% of respondents said they had used Facebook "more than 5 times in the last 30 days' at their leisure. Looking at the total activities, there is at least one private use in the last 30 days, Wikipedia, YouTube, amazon and LinkedIn will be in the first places for our participants, followed by Facebook in fifth. The same applies to other areas (such as the low level of private use of twitter in German SME in this study).

For further analysis, participants were categorized according to their personal usage. This led to three types of users:

- **Heavy users** have used at least five different social media services more than 5 times in their spare time in the past 30 days, (= "more than 5 times" > 5)
- **Rare users** have used maximum one service more than 5 times and a maximum of five services more than once ("more than 5 times" <= 1 AND "at least once" <= 5)
- **Normal users** are the rest of the participants, not falling into any of the above two groups. They were chosen for their central location called a "normal user", which express no qualitative information is connected

Figure 3 describes the relationship between professional and private user types in detail. While the private heavy users still split nearly equal importance on business heavy, rare and normal users, two-thirds of normal private users and over 90% of private rare users are also professional rare users. Conversely, there among all types of private users also professional heavy users. Therefore from the
private user behavior cannot be closed to the professional use of it (and vice versa) without further notice.

<table>
<thead>
<tr>
<th></th>
<th>heavy user</th>
<th>normal user</th>
<th>rare user</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>heavy user</td>
<td>28.6%</td>
<td>35.7%</td>
<td>35.7%</td>
<td>28</td>
</tr>
<tr>
<td>normal user</td>
<td>8.9%</td>
<td>25.0%</td>
<td>66.1%</td>
<td>36</td>
</tr>
<tr>
<td>rare user</td>
<td>8.3%</td>
<td>0.0%</td>
<td>91.7%</td>
<td>24</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>15</strong></td>
<td><strong>24</strong></td>
<td><strong>69</strong></td>
<td><strong>108</strong></td>
</tr>
</tbody>
</table>

Figure 3. User Types - Relations between private and business use

Participants were asked for what corporate tasks social media is generally suitable. The following figure 4 reflects the responses. The participants emphasized the potential of social media for sharing and managing knowledge and information and also primarily as a tool for "networking".

<table>
<thead>
<tr>
<th>Social Media is very useful</th>
<th>Social Media is not useful</th>
<th>I can't make a point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build up and maintain relations (Networking)</td>
<td>79.6%</td>
<td>13.0%</td>
</tr>
<tr>
<td>Share and manage knowledge and information (Sharing)</td>
<td>65.7%</td>
<td>20.6%</td>
</tr>
<tr>
<td>Empower Teamwork (Collaboration)</td>
<td>37.0%</td>
<td>42.6%</td>
</tr>
<tr>
<td>Simplify coordination and agreement (Coordination)</td>
<td>54.6%</td>
<td>29.6%</td>
</tr>
</tbody>
</table>

Figure 4. User Types - Relations between private and business use

These participants have been asked for which company tasks they think social media is suitable and useful for the future. The results of figure 5 shows that most participants want to intensify company tasks with the use of social media - especially in the field of networking and sharing, but also for collaboration and coordination.

The current user profile of social media users in SMEs cannot be clearly determined over differentiation between private and business usage. Revealing in this context is the variation into the category “professional position”. The survey shows, that the majority of participants with leadership responsibilities are heavy business users. The highest business value the participants see is networking, followed by sharing knowledge and information. Intensification of company tasks is the overall goal of future social media usage. Consequently the KMUT platform can contribute to a higher business value for project management orientated to a collaborative implementation scenario under the aspect of networking and sharing.

B. Scenario Analysis

Traditional management structures and collaborative organizational learning exclude each other. Therefore economic success will depend on the changing organizational structures and management cultures. Here agile project management is classified a holistic management approach for learning organizations. The aim of KMUT tools is to support agile project management, and to allow the required network communication of project teams. Therefore the dimension “management approach” is divided in the scale of classic and agile management approach. The dimension of “workplace learning approach” is divided into formal and informal learning processes (see fig. 6). Formal learning describes foreign-organized learning in fixed structures. It is characterized by pre-planned objectives, tasks and content. In formal learning settings usually a trainer or manager decides what a person needs to learn and how. Informal learning is characterized by self-directed learning in form of projects or accompanying work processes. It includes all the learning processes that take place outside of a formal learning environment for example in blogs or through interactions with people in communities. Here individuals decide what and how to learn [15].

Figure 6. Organizational Workplace Learning Scenarios

In the first part of the research project KMUT was a categorized database, a linked open source and web 2.0 list. To get this platform from the data based approach over to the next level of an information platform; the database was integrated in a Drupal website, designed with a first user interface and enriched by tutorial videos. KMUT has reached the status of an information platform with a good fundament of well sorted single and multi-purpose tools for use in the daily work of project managers. As the results from the social media study indicates we decided to focus our implementation scenario on the transition from an “information platform” to a “collaboration platform” to get KMUT to the next level.
The selected scenario outlines the "happy path" of KMUT as a development to a collaboration portal. A special aspect in the interview guideline of the used study was the invitation to let the user tell their story of the last project [5]. So for example, one extracted user story describes the wish of a participant, to get a translated chat for international project groups. Based on this need the following user story was documented:

"As a project manager, I want to chat with my international project team in my own language and the receiver should get it translated in his or her language so that we chat collaboratively at the same time in different languages."

The research team found “babelwith.me” [18], an instant online translation chatroom, where sender and receiver can choose the language they want to read.

To implement the scenario “collaboration platform” learning culture and Communities of Practice play an influential role. Learning cultures are automatically present around us [13]. Therefore no requirement for an implementation is to ask, it’s rather a question of learning culture performance. The process model for analysis and design of learning culture is used here both for the evaluation of the existing learning culture and for the targeted design of an organizational learning culture. Under the involvement of Community of Practice the information platform transforms into a collaborative platform. This results in a practical implementation scenario for KMUT tools (see fig. 7) with the following five transition steps:

1. Initiation: Select a category!

The initiation is primarily focused on the introduction of an informal learning form. Where the potential-oriented promoting of a learning-oriented culture is not excluded. In this step the project manager can select a suitable category (tools, knowledge, education) on the KMUT Platform (see fig. 8). It continues to be aware of the implementation strategy. Due to the high expression of agile management a network approach is preferably to a top down or up button.

2. Diagnosis: Run a current state analysis!

In this step, the project manager should evaluate which tools are already being used for any purpose under what conditions. How are guidelines (see step 4) designed at the moment?

3. Positioning: Pick a tool!

After the interpretation of the results of step 2 and the readjustment of the change target, the selection of a concrete tool in the categories creativity, communication, organization, files and documents follows (see fig 9).

4. Interventions: Design guidelines for implementation!

When implementing the selected tool, the project manager should design guidelines and consider an organizational specific strategy regarding the following questions: How can I enable employees for using the tool?, How do I integrate managers?, How can I further develop the acceptance of the project manager for this strategy?, How can I measure the results of the implementation process to receive an ongoing qualitatively high standard?

5. Reflection: Change experiences in the KMUT Community!

For a continuous improvement the project manager can use the KMUT Community for backing his own change process and provide the community with tools, tips and tricks of his or her own project management expertise.

Figure 7. Transition from an information to a collaboration platform

Figure 8. Navigation and category selection

Figure 9. Navigation and tool selection
IV. DISCUSSION

The purpose of the implementation indicated above is to foster Communities of Practice. Consequently it has to be discussed if the scenario that we identified is suitable for the KMUT Community of project managers?

As discussed by Jane Hart [15], Communities of Practice will run successfully if the three key features (“Ownership, Community Management and involved Time”) relate to the implemented strategy.

“If it is your own or your department’s CoP then you will undoubtedly “own” it. But if you are setting up (or helping to set up) the community for another group or part of the business, they will need to “own” it (or be seen to “own” it) and that you are seen as supporting it. Unfortunately, the very fact that such an initiative is perceived as “training” and/or as being imposed upon a team or group – means it is less likely to thrive than if it is seen as being the department’s or team’s own initiative.” (Hart 2013)

Currently the KMUT Community is “owned” by the research team and set up for a specific target group (SME). Therefore the biggest challenge will be to evolve project manager in the community, because they need to build up a relation to the platform. Community Management is necessary for leading the community. At the moment this function is also taken over by researchers. Staying this way is reasonable, in order to guarantee the independence and neutrality of KMUT. Otherwise the Community Management could be supported by committed individuals from the community itself. A critical factor is the time involvement. To obtain a self-sustaining community, a time-consuming transition is necessary. This is not provided when creating research prototypes.

As we indicated in our introduction, the project management community has evolved over the past decade. Such an evolution is well known from other management areas, think of Knowledge Management and its development since the early 1990s for example. What is new in this century and what partly motivated our study is the growing importance of social media tools for initiating and sustaining Communities of Practice online? Our results support and emphasize the importance of social media for the specific case of a Communities of Practice for project managers interested in state-of-the-art tools of their trade. As Web 2.0-like co-creation tools, social media can in particular make it more likely that community members feel a sense of ownership for the platform.

In the light of the research questions it has to be discussed what value the implementation scenario can add to SMEs business. As the intended value is to manage projects smarter, the open question is how a “smart project management” is defined. Furthermore it has to be discussed what value tools ever might have for project management. The decision to design the presented implementation scenario was based on quantitative research results and a theoretical scenario analysis under certain preferred management and learning approaches. Accordingly KMUT cannot present the optimal implementation scenario for every SME. Human factors like learning culture are not predictable.

V. CONCLUSION

Our paper provides an insight into the use of open source and low budget project management tools. This is a hitherto little explored field whose development is of interest for international SMEs. Organizational learning is thus no longer a matter of budget, but a matter of the proper implementation of existing tools. Our research brings together the (I) relation between social media usage and business value for SMEs and (II) conditions for a collaborative organizational workplace learning scenario. The social media study shows that there is a need for collaborative organizational learning in SMEs. Consequently, out of the mentioned results a practicable, hands-on solution for the implementation of tools in the daily business of SMEs was carried out. With this approach we designed a scenario to transform an existing information platform to become an organizational learning application that includes community creation. A condition for the sustainable use of our implementing scenario is the revitalization of the community over a longer period. On the part of SMEs the involvement of all employees limits the successful use of a tool. However, if this is successful, the implementation of a tool involves the opportunity to initiate organizational learning. Future research should examine the implementing scenario through a qualitative survey within the SMEs context. The next step in the further development of KMUT could be its further development as a mobile application. This could satisfy the need of the target group for a mobile offering.

REFERENCES


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