

Innovative uses of collaborative platforms and social media tools

MARCUS BIRKENKRAHE, Berlin School of Economics and Law, Germany

SHUSHMA PATEL, London South Bank University, United Kingdom

STEFANIE QUADE, London South Bank University, United Kingdom/Berlin School of Economics & Law, Germany

Received: 25 July 2013; received in revised form: 7 August 2013, approved: 02 September 2013

ABSTRACT Collaboration using platforms across a shared network has been on the forefront of IT communication development since Engelbart suggested “Augmenting Human Intellect” in the 1960s, and is one way to address knowledge management challenges by building communities for collaboration. The global success of social media tools in the past half decade raises the question if and how these tools can be used to improve platform-based collaboration. We present three different projects that provide partial answers to this question: (1) real-time course support via Wiki and Wikiversity in connection with agile management methods can overcome drawbacks of existing closed learning management systems. (2) Social tools, templates and videos guide SME practitioners and invite them to interact virtually and manage projects smarter. (3) Legal download of sheet music exploited by bands, groups and individual artists promote their products effectively by the development of the e-commerce platform. All projects show how social media can be used for collaboration in an innovative way without re-inventing technology.

Keywords: collaboration, community, social media, innovation, technology, MOOC, Moodle, Wiki, Wikimedia, Rich Picture

Introduction

Collaboration using platforms across a shared network has been on the forefront of IT communication development ever since Engelbart suggested “Augmenting Human Intellect” in the 1960s (Engelbart 1962). The global success of social media tools in the past half decade raises the question if and how these tools can be used to improve platform-based collaboration. An issue that has already been addressed in industries with significant knowledge management experience like Shell (Goodwin, 2012). We present three different projects that provide partial answers to this question.

CASE 1

Over the period of two terms, we experimented with supporting different courses both at the Masters and at the Bachelor level using a Wiki as a well established platform and Wikiversity (Mediawiki) as a well established provider of so-called Open Educational Resources (OER; Atkins et al 2007). Originally designed to overcome drawbacks of an existing closed learning management system (Moodle, in our case), we asked ourselves if a Wiki would turn out to be a suitable platform for real-time course support, course content extension, discussion and term papers creation and supervision. The use of agile methods known from software development as Scrum was an important process component for the success of this setup. Recent results by Tacke (2013) confirm some of our conclusions and prompt additional questions for further investigation. Our research comes at an important time for the future of wikis as collaborative platforms in teaching and learning: there is an increasing interest in MOOC (Massive Open Online Courses), and wiki-based teaching platforms like the German Wikiversity (which hosts our course materials) are discussing their purpose and structure [personal communication, 2013]. Acceptance and needs of learners are currently undergoing the greatest changes since the first studies on the use of Wikis in the classroom (Lawler, 2008; Friesen and Hopkins, 2008; et al.).

Wikis of course have been in public use across institutions of higher learning for almost two decades. The infrastructure used by us (Wikimedia's Wikiversity and the Open Source software Moodle) was established in the mid-2000's. Based on our personal experience at different universities, it's not unusual to mix platforms, sometimes because of technical issues, sometimes because of historical conditions: for example, at one stage, the institution supported five different learning management systems none of which had a well working Wiki. Consequently, a number of lecturers use their own private Wikis for teaching. Over the past few years many institutions have streamlined and optimized their infrastructures. Partly because tools like Wiki or Moodle, formerly considered exotic and difficult, have become mainstream. More recently, so-called social media applications, like Facebook or Twitter, or even workflow tools like Google Docs or Dropbox, have taken their place. Therefore the general problem of creating mash-ups between different tools that have visible didactic value, remains the same. For this case, as explained in detail below, we mixed the Moodle and Wiki platforms and the agile project management method Scrum and applied methods of face-to-face coaching and off-line coaching to support several student teams during their term projects. We were asking ourselves if it was possible to give new life to a simple, established platform such as Wiki by employing innovative project management methodologies such as agile prototyping alongside a standard learning management system like Moodle.

CASE 2

To serve the practitioners with a smarter and favorable project management, the research project InterComp SME 2.0 has created KMUT - a platform for project management (<http://kmut-projektmanagement.de>). Funded by the German Ministry of Education and Research and together with its science and business partners, this project focuses on the development of modularized training offers for small and medium-sized enterprises (SME) at the interface of information technology and culture (Birkenkrahe, 2009). This collaboration platform provides a structured overview of open source and social media tools and guides the

project management community with templates, training and videos. Designed especially for the needs of SME, it demands the involvement of all employees to become a successful organisational learning opportunity. Gunnoltz and Quade (2013) explored the need for collaborative organizational learning in SMEs and designed scenarios to get the KMUT platform from an informational into a collaboration platform. This paper focuses the soft indicators as a part of the soft system thinking described by Maani and Cavana (2000) which influence the human and organisation in the implementation process based on a real problem situation. In this research the implementation of KMUT as a social media tool will be examined to verify an innovative way of use of the tools in the workplace learning process. The Shell Group used soft system thinking methodologies in the 1980s (Milan 2007) to innovate their manufacturing service. According to Birkenkrahe, Kjellin and Quade (2011) who inspired people to transfer descriptions of knowledge in a formalized context, we transfer storytelling cases of interviewees into user stories. These user stories are a formalized problem situation, which is the starting point of the Soft System Methodology by Checkland (1990). A conceptual model based on a rich picture shows an innovative use of a KMUT collaboration tool. We asked ourselves if it was possible to invite practitioners to use social tools to manage their projects smarter and ensure a transferability of a conceptual model for other workplace learning processes for the project management community.

CASE 3

The rapid increase of unlicensed websites which distribute free, user-generated sheet music has presented a significant problem for the printed music industry over the past decade. Whether the owners of, and contributors to, these websites know, or even care, that they are breaking the law remains to be seen. The Internet has facilitated the infringement of intellectual property rights on an unprecedented scale and is thus regarded as a serious threat by businesses for which the licensing of copyrights to third parties is a core revenue generator. Much has been documented about the battles fought by the music recording, newspaper and book publishing industries to protect and, in some cases, salvage their content from being illegally distributed online. For these industries the digital revolution has had a dramatic and lasting impact. There is very little existing academic literature, which refers specifically to the printed music industry. In light of this, the key aim of this study is to confirm the extent to which the digital revolution has impacted upon the sheet music industry. The investigation identified the emerging E-business models from this sector, and considered the extent to which these models were successful. A case study into a single organisation, highlighted the reasons behind its decision to adopt a digital strategy and the methods through which the company achieved a sustainable competitive advantage in the digital marketplace.

For SMEs, the development of an e-commerce platform can be a significant investment and result in different workflows and changes in business models. The exploitation of the platform to enable collaboration is critical to organisations. The collaborative platform developed for the sheet music industry enabled renowned musicians and bands, the hobby musician, teacher, as well as large organisations to 'hook' onto the e-commerce platform to sell and deliver products and allowing the management of copyright and royalties. Social media was used by bands, groups, and individual artists to promote their products through their fan club sites. The collaborative platform has been further exploited by schools and organisations to deliver sheet music for festivals, competitions and other events, more efficiently and effectively and allow the legal download of sheet music.

The following research questions for this paper address the common issues of all three cases best:

- If and how can social media tools be used to improve platform-collaboration?
- Can social media be counted as a success factor adding value to each shown case?
- If and how can the implementation of collaboration platforms guide communities to an innovative use of content — like sharing or collaboration?

Methods

The different project examples lead to the three different methodological approaches to answer the above mentioned questions that have been adapted to our problems setting: (1) questioning course participants with full immersion of the researcher who was in a double role as both lecturer and researcher (in case 1); (2) soft system modelling of a social media tool (in case 2); and Rapid Application Development (RAD, cp. Maurer und Martel, 2002) approach (in case 3).

CASE 1

Our approach for testing the combination of wiki and agile prototyping was participatory design with full immersion in two courses, followed by an anonymous online survey among the students. We introduced the platform/methodology (Wiki/Scrum) combination mentioned above in two different courses: a BA course on business information systems with twenty-six (26) undergraduates (in their second term) specializing in business informatics; a course on problem solving methods with eight (8) MBA candidates (in their third term). The BA course was conducted in German, the MBA course was conducted in English. Both courses were supported by a Wiki page set up by the lecturer using the infrastructure of the German and English Wikiversity respectively, a public infrastructure using the lecturer's user pages (Birkenkrahe, 2013a; Birkenkrahe 2013b). The students were asked to develop research papers on self chosen topics related to the course content, in teams of three to five members. They created additional Wiki pages containing the papers linked to the central course page. In line with the agile project management methodology called Scrum, the work of the students took place over a period of three months divided in three sprints of three weeks each. At the end of each week the students had to provide a written review and publish it on the discussion page that accompanies every Wiki page where it was commented by the lecturer. The format for the weekly reviews was self chosen but the content had to include answers to the questions: (1) which tasks did you plan for the current week? (2) which tasks did you not complete? (3) which changes (if any) are you going to make in order to address issues arising from the difference between (1) and (2)? At the end of each three-week sprint each team presented their prototype in the form of the current version of their paper in front of the entire class. In addition, each team received a bi-weekly face-to-face coaching session from the lecturer acting as a Sprint Master, an agile process expert rather than content expert. The final Sprint review, team presentation of the final prototype, the finished research paper, was followed by an anonymous online survey designed to solicit rich comments from students about the combination of Wiki and agile prototyping. The agile method used by the students, is the well-known "Scrum", originally conceived for software development processes (Schwaber, 2004). It was modified for this course to accommodate the specific needs of higher education. Both the BA and the MBA course were also supported by a Moodle platform that served purely as a repository for course materials in the form of presentations and

for upload of the final paper by the students. For the BA course, the students also had to write an individual paper in the form of a web-based blog. The survey questions were asked in an Etherpad environment (see fig. 1) to obtain students' views on the value of the Wiki, Moodle and Scrum in the context of support for the course and for the project work.

It is methodologically relevant in this context to note that the combination of Wiki and agile methods for the purpose of creating a paper was explained to the students as a pioneering step: something that the lecturer had not done in this form with students in comparable courses. Also, the course grade was given purely for the final presentation, not for the paper itself. We introduced these boundary conditions to remove or reduce the likely dependency of student reactions on summative evaluation in the form of grades.

This course concept—combination of public wiki and agile project management—had already been tried by the lecturer over two previous terms in a different BA course at graduate level (fourth to seventh term) on enterprise modeling methods where the objective was, however, to create an actual process model rather than a research paper. This use of the wiki appears too close to the standard way of using collaborative online platforms in projects (in school or otherwise) and therefore no effort was made to gather data from the students in those courses, though the methods of formative evaluation and coaching during the agile project phase were the same.

Our survey was made available to all students of both courses. From our experience, the sample students of both courses were representative for students of their respective disciplines at this study level. Both of these parameters are very likely relevant for the student's responses: for example, MBA students in their first year are less interested in scientific writing because their thesis still seems far away to them. And to BA students in their first term almost all methods and tools at the University are new to them, which means that they are likely to be less discerning. Also, the class size influences the responsiveness to online tools. These limitations alone mean that our results can best be considered indicative for issues and trends in connection with the platforms employed for teaching, but not necessarily representative.

CASE 2

We developed a conceptual model based on a rich picture of an innovative use of a social media tool of the project management portal (KMUT). To point out the soft indicators for our approach to show which influence the interaction of human and organisation in the implementation process have, we choose Checklands (1990) Soft System Methodology. Based on a qualitative survey and user stories of the research project InterComp SME 2.0 a rich picture shows exemplary an innovative use of a tool from the collaborative KMUT project management platform. This problem situation leads to a conceptual model.

To design a conceptual model based on a rich picture – designing decision support system - the following first four steps regarding the 'Soft-System-Methodology in Action' (Checkland 1990) were used:

- *Fact Finding*
- *Draw Rich Picture*
- *CATWOE & Root Definition*
- *Create Conceptual Model*

The ongoing steps of the soft system modelling (5. Comparison with the problem situation, 6. Changes and 7. Action Plan) will not be considered in this research step. We focus on the

assumptions of the soft facts in the implementation process up to the conceptual model. Based on the fact finding of qualitative researched user stories we want to find out how a social media tool of the KMUT portal can be used in an innovative way. Leading towards a definition of the problem and the system, this is a way of defining the system in terms of carefully restricted 'subjects' and 'objects':

Fact Finding

To process the problem situation traditional fact finding (observation, documentation collection, Interviews), logical-driven or cultural-driven, was used to focus on humans and interactions. A user story extracted from a qualitative business survey from Quade, Birkenkrahe and Habermann (2012), where project manager (n=101) of various small and medium sized enterprises have been asked about their behaviour, needs and wishes of technology use in their project word. The method from Cohn (2004) was adapted for describing the problem situation with the following syntax:

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

Draw Rich Picture

The rich picture symbolises the problem situation and show - based on one tool example of the KMUT project management platform - how that rich pictures represents the people and things that interrelate with or within a problem situation by drawing symbols of hard and soft facts, process and structure. It shows the organisation in all its technical and social complexity and summarizes main variables and issues in a system of interest by illustrating the situation dynamics.

CATWOE & Root Definition

To produce the root definition the problem situation; this is explained and drawn in the rich picture that will be extracted. Patel (2012) specified the C.A.T.W.O.E. criteria with the following statements:

- C** Customer/Client: who the system benefits or victimises
- A** Actor: who operate the system
- T** Transformation: what the system does
- W** Weltanschauung: why the system exists
- O** Owner: who controls/is in charge of the system
- E** Environment: how the system is constrained

When the CATWOE criteria a defined and agreed, the final root definition can be derived. The extraction will refer to the system's functionality and serves as a fundamental statement through the development process. These criteria help form the *root definition* of the system's functionality. The definition agrees on a statement with the user along the lines of:

"Who (ACTOR) is doing what (TRANSFORMATION) for whom (CLIENT), to whom they are answerable (OWNER), what assumptions or 'world view' (WELTANSCHAUUNG) are being made, and in what context (ENVIRONMENT) this is being done." A briefer version of the root definition syntax was stated by Karve (2009): 'a system to do X by (means of) Y in order to Z' (*what* the system does - X, *how* it does it - Y, *why* its being done - Z).

Create Conceptual Model

The conceptual model illustrates the activities and their relationships based on the root definition and extracted from the rich picture, which achieves the goal of the system identified in the root definition. This serves as a foundation for the information model and points out the soft indicators which influence the interaction of human and organisation in the implementation process. The comparison of the model against the perceived reality of the problem situation verifies the concept and can be adjusted in the organizations change process.

CASE 3*Music industry e-commerce platform and business model development*

For the music industry a Rapid Application Development (RAD) approach was adopted. RAD promotes collaboration and promotes gathering requirements alongside the prototyping. It also focuses on the active participation of the business owner or client in prototyping and testing of the system as it develops. Thus RAD is an iterative and incremental process (Fig. 2). An off the shelf e-commerce platform ‘shell’ was procured and tailored to meet the needs of the company. As the basic elements of the platform were already developed, the bespoke functionality of the system was incrementally developed to meet the needs of the organisation. This was a critical part of the process, as the company’s activities and processes were very traditional and the migration to digital content was a substantial shift in their business processes, resulting in new business models and also establishing a robust business strategy. Osterwalder and Pigneur (2002 p.2) define a business model as “the conceptual and architectural implementation of a business strategy and the foundation for the implementation of business processes.” Teece (2010 p.173) adds that “A business model defines how the enterprise creates and delivers value to customers, and then converts payments received to profits”. He explains that the ‘business model’ is a relatively new concept: “Business models have only been explicitly catapulted into public consciousness during the last decade or so. Driving factors include the emerging knowledge economy, the growth of the Internet and E-commerce, the outsourcing and off-shoring of many business activities, and the restructuring of the financial services industry” (Teece, 2010 p. 174). Osterwalder and Pigneur (2002 p.1) suggest that rigorously defined e-business models enable companies to implement their E-business strategies and to “assess, measure, change and sometimes even play around with and stimulate their business.”

Results

In the following chapter we present the results (case 1) of the agile public wiki for learning and teaching (case 2) the rich picture which transitions into a project management tool concept and (case 3) the result of the e-commerce exploitation with social media up to the actual point of each collaboration platform to answer the initial research questions.

CASE 1

The students worked in two different environments to complete their term papers in teams, the open source learning management system Moodle (using the school’s intranet), and Wiki (using Wikiversity). The teams were instructed to adopt the agile project management

method known as “Scrum” originally developed for software product development processes. Fig. 3 shows a typical Scrum process from the initial “product backlog” stage (identification of customer requirements) to the “sprint backlog” phase (list of tasks for the Scrum team), through different sprints (periods of working on the prototype by executing tasks, including daily scrum meetings), to a working prototype product (following a final sprint review). To make this process work, the rules and roles need to be laid out clearly: the process owner (typically a customer, in the products development situation) and the so-called Scrum Master (a process expert that coaches the Scrum teams through sprints) are the two most important roles for the traditional implementation. Scrum is one of several “agile” development methods which instigate and require more flexibility, more dialogue between supply and demand side and which generally lead to working prototypes faster than traditional development cycle methods such as the Waterfall method with which agile methods are often compared (Wang and Vidgen, 2007).

For the purpose of both the BA and the MBA course, the original Scrum method was minimally modified: instead of a software product, the student Scrum teams were asked to produce a term paper. Successive versions of this paper were labeled “prototype” and the students presented them at three different sprint reviews separated by sprints of three weeks in length as shown in the schedule in fig. 4.

The only significant deviation from the original scrum set up was the fact that the lecturer both the process owner (PO) and the Scrum Master. In the original scrum, it is rather important for these two roles to be separate because the team has a responsibility for delivery only towards the PO while the Scrum Master is a supporting and coaching role.

None of the students in either course had any previous knowledge of agile methods either in software development or in another professional environment. The students received initial information (including articles and tutorials) on agile development. After that the method was solely explored and acquired through the completion of the term project. According to our knowledge, it is rather typical for methods like Scrum, which originated in a very specific environment (software development) to have to be adapted and customized by whoever uses them. At the end of the course (but before summative evaluation of the course results in the form of grades), the students were asked to participate in a anonymous questionnaire regarding the tools used during the course. The student answers are summarized below and further discussed in section 4.

What do you think, in principle, about supporting a course with a wiki? — In the first question the students were asked what they thought about supporting the course with a Wiki in principle. Both student groups (MBA and BA) highlighted that they thought the wiki was a suitable platform for collaboration both in terms of working on a paper in a group, and in terms of support by the lecturer. The Moodle platform was considered to be superior for facilitation and documentation. The greater security of Moodle, which in the case of these courses was implemented on a protected intranet, was emphasized.

What did you think about the support of this course via wiki? — Inquiring about the value of the specific support of their courses via the actual Wiki used for this course yielded even more detail along the same lines of argument: an interest of the students in protecting their information against strangers (“random people”); the opportunity to work on course relevant topics in a group: “all the parties participating [...] can add and give their remarks (like in the course)”. The views of the MBA students were, on average, more positive than the views of the BA students. Additional positive points of view included: the course was seen as “a refreshment and [...] a motivator to train something new”; “forced us to stay (constantly) close [to] the topic over the whole course”, and the lack of formatting options in the wiki was seen

as an advantage during paper preparation. But the students also complained about the difficulty of having to juggle two platforms at the same time and about lack of instruction to get started.

When you compare the support of this course through Moodle (largely through files and forum) with its support through wiki (text, images, photo protocol with comments)— which did you prefer and why? —We now asked the students to directly compare the two platforms used - Moodle and Wiki - though it would be more accurate to compare Moodle as a software with *Mediawiki*, the specific software behind Wikiversity, a learning project developed by the Wikimedia foundation (better known as the organization behind Wikipedia). In order to avoid too much repetition with regards to the previous general questions, the students were reminded in the question all the respective offerings open to them in each platform — in particular files (course materials) and forums (for discussion) in Moodle; text, images and a commented photo protocol as well as project process comments in the Wiki. The answers show that all responders had a good understanding of the possibilities of both platforms and also of the fact that they are largely comparable. One responder even went so far as to suggest introductory exercises for Moodle users entering a Wiki for the first time. Especially the BA users supported the use of Moodle for lecture and slide- or text-based delivery vs. the preference of Wiki for lectures in which "interaction takes place, like games, discussion, brainstorming etc."

What do you think about preparing your project papers using a public wiki as in this course? — Moving on to one of the methodological, innovative "mash-ups" that were involved in this course: the students have been asked to prepare a term paper in a team using a public Wiki while at the same time working with Scrum. Asked how they found using a Wiki for their term papers, all respondents were positive: they felt that communication both within a team and between teams were increased; they liked the public character of the work because now it would "not gather dust in the archives of the examination office". The greater responsibility when working in the public eye was felt, both in terms of formal conditions like copyrights, and in terms of professionalism, because the student "and to think twice, before sending out the link for example to interviewees [since] it might look unprofessional due to content mistakes."

What did you think about the [lecturer's] comments in the wiki regarding your project work? — In order to use the agile method Scrum, the progress of each team had to be monitored from a non-judgmental, formatively evaluating point of view. This was done through bi-weekly face-to-face coaching and through weekly comments by the lecturer in the Wiki. In this case, the MBA students (who were also only a few months away from having to write their thesis) were much more positive than the BA students who seemed a tad bothered by having to check in and receive comments (something that they're not used to do in other courses in all which was one of the reasons why we adopted this method). One MBA student felt that the wiki comments helped with "reducing waste of time in meetings" and that communication was more efficient. Even the positive comments revealed however that the proposed structure for checking in with the lecturer off-line on the wiki hadn't been fully understood. Both the process and the content of the processes could be improved said the BA students.

What do you think about using an agile method (Scrum) for the preparation of your project work? — Asked about the value of the agile methods Scrum specifically for the preparation of the team term paper and presentation, the feedback was largely positive. One student had difficulty coping with "all additional thoughts generated in the sprint reviews and the freedom to choose and change" — a very perceptive view of what Scrum was supposed to achieve, but also of the challenges involved to those not used to working in an "agile" manner.

Did you ever edit the main course page in the wiki yourself (for example by inserting a link)?— The ability to edit being one of the key properties of Wikis, it was important for us to check if students realized the potential of co-creation also with regards to the so-called "main course page" which had been established and was continuously edited by the lecturer. Only two students admitted to having edited the main page — the main obstacle mentioned was a shyness and reluctance "to write anything that might have been wrong." Only one student said he had made "improvements" on the page. The page history showed a few more edits from either students or other outsiders but overall this page remained almost as untouched as a traditional PowerPoint presentation would have been.

Is there any other tool (besides Moodle and wiki) that you would rather have used during this course?—There were few answers forthcoming in response to the question if the students would rather have used a completely different tool besides Moodle and Wiki. One student mentioned Google docs as an alternative ("that was not too bad as well") and another one mentioned a web-based team collaborative tool called "trello" (one of many web-based tools to support team task scheduling).

Do you have any suggestions for improving the use of the wiki in this course?—Asked if they had any suggestions for improving specifically the use of the Wiki in their course, several students had detailed ideas for improvements. These included adding article (file) uploads to the Wiki, more Wiki training time, greater clarity with regards to the different agile management roles, and basing class presentations directly on the Wiki (rather than using it only as an off-line support tool).

CASE 2

The following chapter presents the results of the conceptual model of the soft system approach, adapted at one use case of the project management platform. The model investigates in an innovative use for a group of project manager who are working collaboratively in international, distributed teams with various natural languages, who use for informal project exchange a machine translates chat.

The selected problem situation outlines one case of a qualitative interview with a SME project manager in the InterComp SME 2.0 project. Birkenkrahe, Kjellin and Quade (2011) picked a special aspect of the interview: The interviewer invited the participant to tell their story of the last project and asked them for one wish they could ask a fairy goodmother to get their projects done more efficient. 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." (1)

On the KMUT project management platform the research team extracted "babelwith.me" (lifechurch 2009) in the communication category. This chat translates immediately the words via google translation, sender and receiver can decide which language they want to read.

The *facts* (1) have been taken out of this user story to draw the *rich picture* e(2) which symbolizes the structure and process of the people and interactivities as shown in fig. 5. The rich picture summarises the problem situation extracted and symbolized of the user story. It is produced to identify what the systems purpose is and who the interested parties are. The above (fig. 5) represented situation shows the process of a project manager, who wants to use

his natural language to chat with his project team. The international distributed team consists of various natural languages. Apart from a consolidated formal project language for formal documents, meetings, etc. the need for an exchange with team member informally in the natural language is the starting point (see user story). A social tool, which does a machine translated language (google translations) for sender and receiver has been chosen, e.g. the sender types the text in german language and the receiver gets the swedish translation, automatically via a google translation. This kind of social media tool can be extracted on the KMUT project management portal.

CATWOE & Root Definitions

CATWOE: Customer/Client: Project Manager; Actor: Project Team; Transformation: natural spoken language -> transformed translated textual chat language; **Weltanschauung:** The System helps sender and receiver of informal text messages to write and read in his or her own language; **Owner:** KMUT portal; **Environment:** A group of project manager working in international, distributed teams with different languages (some language translations are not available and therefore limited)

Root: A system owned by the KMUT portal, operated by the project team so that the project manager and clients can use native spoken language and it can be translated by a machine translator into another language. The system will help both the sender and the receiver to use their own native language to collaborate and send and receive text in their any language they wish, within the constraints imposed by the language translator (some languages cannot be translated), etc. for the constraints.

Conceptual Model: The conceptual model (Fig. 6) orders the operational activities of the project management tool - a system for informal chat translation - has been produced to show, how the system world would function, i.e. what activities (operational and monitor/control) are necessary to take place.

CASE 3

The sheet music industry is very traditional and slow to adopt technological advances. The company's activities and processes were very traditional and the migration to digital content was a substantial shift in their business processes, resulting in new business models and also establishing a robust business strategy.

E-commerce utilises a number of technologies, including mobile commerce, electronic funds transfer, supply chain management, online marketing, etc. and typically uses the web in the transactions, at least once, and it may also include other technologies such as e-mail, social media and telecommunications.

Any online exchange between two or more companies is commonly categorised as 'B2B'. While traditional business-to-customer (B2C) relationships continue to thrive online, the last decade has seen a considerable growth in B2B networks and a tendency for organisations to work in cooperation with many partners rather than acting alone. This enables companies to collectively benefit and reach higher levels of achievement than they would on their own (Wilson and Abel, 2000).

Creating a successful B2B model can be highly complex and involves a large amount of planning, scoping and investment in new technology and infrastructure. The organisation needs to ensure that multiple legacy systems on different platforms are joined accessible and

combined with automated supply chain management systems and real-time inventory control software.

Various models fall under the B2B umbrella. Dou and Chou (2000) classify B2B E-commerce into four recognisable categories:

- Supplier-Oriented ('Sell-side Marketplaces' (Skjøff-Larsen et al., 2003))
- Buyer-Oriented ('Buy-side Marketplaces' (Skjøff-Larsen et al., 2003))
- Electronic Intermediaries ('Infomediaries' (Ordanini and Pol, 2003))
- Virtual Corporations ('Industry Consortiums' (Kalakota and Robinson, 2000))

The benefits of B2B can be summarised as: 1) Enhanced communication which can improve client relationships; 2) Enhanced productivity which allows the sharing of necessary information of "just-in-time" systems; 3) Enhanced business development which allows for collaboration in product design and which can lead to lower design and production costs; 4) Cost reduction from lower administrative operational costs; and 5) Improved information delivery that is low cost and standardized (Wilson and Abel, 2000).

The company's move from traditional business models to digital content resulted in establishing a hub where content providers and E-tailers can trade products and services. Hubs are neutral and can act as intermediaries, where they are the third party in a "central position between supply and demand, aggregating both buyers and sellers in a neutral exchange environment." (Ordanini et al., 2004, p.282)

Kalakota and Robinson (2000) explain that hubs have evolved to help companies manage their entire supply chain: they enable members to collaborate on strategic and operational planning, create new trading partnerships, help to better match production with demand and thereby accelerate cycle times.

"By providing these services collaborative hubs can increase site stickiness, generate multiple revenue streams, and create barriers to entry. Providing these services is an essential component of collaborative hub strategy, if the participants expect to develop a sustainable advantage and be the market leader." (Kalakota and Robinson, 2000, p.26)

However, hubs must develop critical mass in order to sustain the market model, increase match opportunities and attract new members to stimulate growth (Ordanini et al., 2004). Hubs have taken on various forms. Kalakota and Robinson (2000) describe how 'Auction Hubs' such as E-Bay offer one-stop shopping in fragmented buyer and seller community by aggregating disparate information from multiple supplier catalogues. They suggest that there are two categories of hub:

- Buyer Consortiums – large companies aggregate their buying power and drive down prices;
- Supplier Consortiums – provide compelling environment for buyers by aggregating key suppliers and offering product depth, breadth, selection and services.

The company created a hub, on their e-commerce platform based on both categories. They were able to leverage their assets, not necessarily to dive process down, but to enable the management of digital rights for all its stakeholders – the independent hobby musician, the teacher, the band or established musicians and thereby developing a 'supplier consortium' to

enable all musicians to have an equal presence and ability to sell, as well as offering the ‘depth, breadth and selection of services’ to all.

Discussion

During the discussion of all three cases, common themes emerged, most notably the effects of increased interaction, collaboration and the benefits of organizing team processes in an agile manner. In the following we discuss the results for all three cases to highlight their differences and commonalities.

CASE 1

From the point of view of students who performed project tasks in a team throughout an entire term, the drawbacks of the traditional single platform work are listed below together with the measures taken to address these in the context of two courses at undergraduate (BA) and at Masters (MBA) level:

- *Interaction:* The vast majority of lecturers do not use the platform for interaction but only to serve static course materials — to address this, we introduced the Wiki with its simple structure and open editing possibilities to encourage interaction with the students; in this context we used the Wiki to support course work chronologically by providing complete photo protocols of classroom work and commenting these after each class.
- *Sharing:* Student essays, reports or research papers are usually made available to the lecturer at the end of term purely for purposes of evaluation by the lecturer, and are not shared between students of a course or between courses — in order to facilitate sharing of student results throughout the term, we made content creation in the public wiki obligatory as well as routine reporting on progress (during regular “sprints” known from Scrum).
- *Collaboration:* Though we live in an age of potential co-creation (i.e. collaboration on authored content, one of the key purposes of Web 2.0 technology), lecturers typically prepare the materials separate from the students who do the same. There is no co-creation of course material except temporarily during classroom discussions — by adding a Wiki page to the standard Moodle platform, we sought to enable students to comment, improve and add to the initial course materials provided by the lecturer.
- *Agile project management:* During (and often after, alas) coursework students typically are left to their own devices. Especially in undergraduate classes, intensive, feedback- and process-focused coaching of individuals or teams to ensure higher quality output is an exception rather than the rule. — We used the Wiki in connection with a simplified agile Scrum methodology to comment on the progress made by student teams in the course of their project work.

Theme	Situation	Innovation
(Learning) Interaction	Courses focus on static course materials instead of interaction	Wiki with post-mortem commented photo protocol and discussion page
Sharing (results)	Student work is not shared across teams or terms	Content creation in a public Wiki including sprint progress reporting
Collaboration	Students have little opportunity to influence or improve materials	Wiki page where students can edit and contribute to course materials
Agile project management	Courses yield little formative, results-focused feedback	Simplified Scrum methodology to increase agility, reporting in Wiki

Our findings (see section 3) from questioning the students of both courses largely confirmed our hope that an innovative use of well-known tools would improve learner satisfaction with regards to the issues A-D. The students expressed repeatedly that they felt that the Wiki was a suitable, even powerful medium to enable more interactivity and support and interactively designed class. There was no specific comment on the commented photo protocols which we had felt to be particularly useful and whose preparation had taken considerable time. However, these protocols were primarily meant to be psychological anchors for the students' learning experience, and to help them to deepen and/or repeat some of the content after the course/session. Several respondents confirmed that they were delighted and positively impressed by being able to see what other students were doing while they were doing it. This was also confirmed by comparing the development of the students' weekly reporting and sprint review presentation techniques: in both cases, and in both courses, the best teams managed to model techniques which were then copied by the other teams. This led to a rapid process improvement and ultimately improved results. At the same time, many respondents were unsure if they liked the fact that the wiki was open to the entire public (rather than the other students of the course only).

Our approach to use a public wiki was partly motivated by Guth's assertion (2007): "Wikis are being used in educational settings more and more but they are often installed within existing institutional Learning Management Systems [...] and as such are private, readable and editable only with a password, or semi-public, readable but not editable without a password." Our hopes to motivate the students to co-create course materials by engaging them as editors of the main course wiki were not justified: only very few students use this possibility. Respect for the expertise of the lecturer (justified or not) and for the integrity of his material dominated their behavior. We did not, through our questions, find out, what could be done in this respect. Frankly, we had not expected it given that the success of other global Wiki projects (like Wikipedia) is based on the principle of co-creation and collaboration. However, the widespread use and attractiveness of an encyclopedic tool like Wikipedia can obviously not blindly be transferred to the problem of co-creation in a class.

The students embraced (at Masters level more than at Bachelor level) the offer of managing their team projects in an agile fashion using the Scrum method. For the BA course, the perceived aspect of process control tainted the coaching experience while the MBA students

appreciated the structure and the feedback more. There's little to be done regarding the undergraduate students since the appreciation for process structures is partly a function of advanced study. Both for the general use of the Wiki and for the use of agile methods the lesson to be learned seems to be that we need to simplify our set of instructions for the students.

Also regarding both the introduction of Wiki and of Scrum as well as the parallel use of Moodle and Wiki, students of both courses and levels required more training and instruction. Quite a few students complained about having to follow activities on more than one platform. This complaint is, in our practice, not restricted to our course setting. It's well known for our experience with introducing blended learning tools that lecturers tends to overestimate the willingness and availability of students to show the same degree of online presence that the lecturer must show when conducting the course. Instead, students easily feel insecure about missing information and while many of them are, on average, more or less continuously engaged in social media communication, they cannot be expected to keep an eye out for online activities related to class work at all times. One way to ease their burden is to limit the number of platforms and commit to a transparent and simple communication process with the students. Introducing, as we have done it, for the purpose of scholarship, two new tools and one new method of working is not recommended for regular teaching practice.

Lastly, we would like to highlight the fact that we used several social media applications (etherpad containing the questionnaire, more specifically titanpad.com; URL abbreviation service for background reading, more specifically bit.ly) to obtain our results. While this is methodically rather unexciting (and perhaps worth discussing with regard to the validation of the results, in another paper focused more on method), the success of our method of public, anonymous student enquiry using social media tools indirectly confirms the trend alluded to in the outset, that social media tools (like Etherpad) can have an innovative effect when mixed with traditional tools. Our findings encourage us to pursue the use of traditional platforms such as Wiki as well as operating wikis not just (as is the standard) in the context of closed learning management systems but rather in the open (using publicly available, free infrastructure such as Wikiversity). The research as such is too limited however to warrant immediate changes to the current e-learning university strategy. We consider our results at its best indicative for issues and trends in connection with using traditional platforms for teaching. In order to test if the results are representative for different student groups at different levels and from different disciplines of study, further investigations are necessary.

CASE 2

We developed a project management platform, which uses various free or low-budget open source and social media tools, next to templates and trainings. This offers project manager one collaborative platform where they find links to some common tools like Dropbox, GoogleDocs, Evernote, Skype and some more unfamiliar open source software like Asana, Realtimeboard and Basecamp including explanations, how they can be used to manage project work. Compared to other project management software, which is often oversized and cost-intensive, the platform invites the project manager to use the free tools and share their experience in the community, especially regarding the needs of small and medium sized enterprises.

The conceptual model of the soft system thinking laid emphasis on the soft indicators for our approach to show which influence the interaction of human and organisation in the implementation process of the offered tools of the project management portal might have.

- The KMUT project management portal overcomes expensive traditional project management software, which is often oversized for the needs of small and medium sized enterprises. The free available tools, templates and trainings of the collaborative platform give the project manager the opportunity to use single tools for his or her project purpose.
- The community of the KMUT portal stills the fear of a SME project manager to use unfamiliar tools by sharing experiences. Each linked tools on the website is explained in a project context.
- How one single tool of the KMUT platform could be used in an innovative way and how the system and the people interact has been shown in the rich picture and the conceptual model. With a special consideration on the soft indicators based on the user story of a previous qualitative survey the interaction of informal chat was represented.

The findings indicated our approach of possibilities to invite practitioners to use social tools in an innovative ways to manage their projects smarter and ensure a transferability of a conceptual model for other workplace learning processes for the project management community. The complex interactions as part of a project management process have been filtered and changed to an innovative use in the course of applying social media tools and open source applications.

CASE 3

We developed an e-commerce platform and new business models to support the company in minimising illegal download of sheet music. It resulted in the development of new business models and new business strategies. The collaborators in the platform benefitted from the access to a large volume of sheet music, licence of their products and also have a web presence formally with the backing of a large company. Social media was used by the various established groups and bands to drive traffic to the e-commerce sites and thus increasing sales.

Theme	Situation	Innovation
(Commercial) Inter-action	Digital content was not available	Digital sheet music is sold on an e-commerce platform
Sharing	Artists have little opportunity to share content and have online presence	Content sharing on an e-commerce hub and use of social media to drive traffic to hub
Legal download	Music is downloaded illegally	Royalties and copyrights are managed
Agile development methodology	New business models are not developed quickly enough in a fast-moving field	New business models are quickly developed alongside applications using Rapid Application Development

The limitations to the e-commerce platform and the areas that further work needs to be done include: Security – especially as there is third party access to the content; Down-time – which is an issue for most web based system, but especially ones where hubs are in place; and Compliance – where the digital rights are managed across different territories, with different legislation.

Conclusions

There are high expectations that social media applications in the professional worlds will innovate the connected fields of learning, working and consuming in the same way in which they have revolutionized private communication in the past decade. Our three cases (see fig. 7) show the innovative use of social media of our projects and different collaboration platforms.

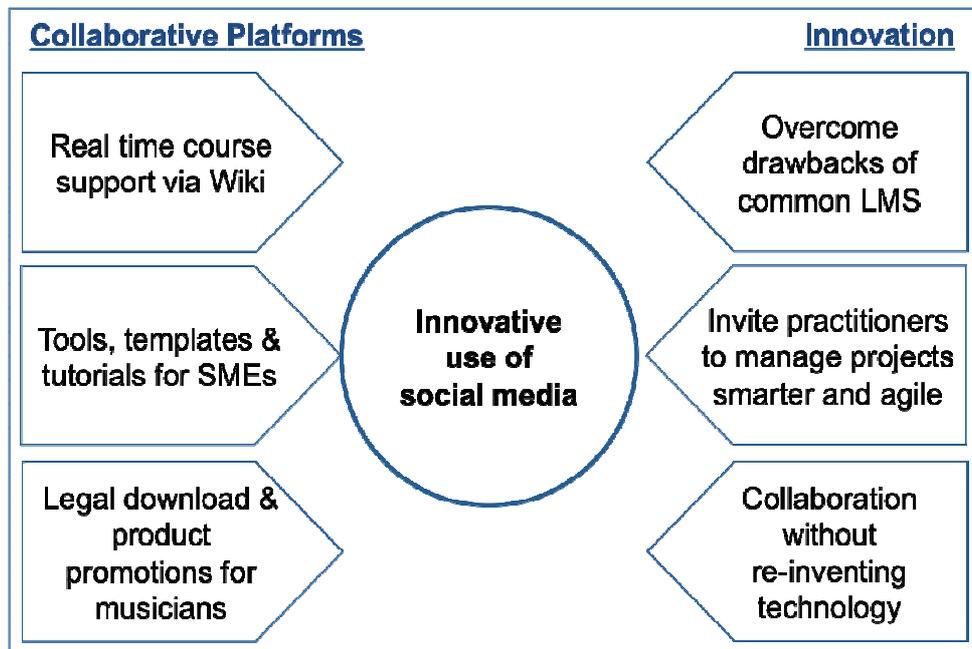


Fig 7, Innovative uses of collaborative platforms via social media

In this paper, we presented three cases from each of the worlds focusing on digital platforms as established social media tools. In all cases, electronic platforms were developed in cooperation with the users of these platforms. We identified three common, positive effects across all cases: (1) increased interaction between users; (2) increased sharing of content; (3) positive impact of employing agile development methodologies. Only in one case (sheet music/ artistic platform) did we also notice improved collaboration, not only increased sharing, for reasons, which will require further investigation. In other words, social media tools are being used to improve platform for collaboration specifically with regards to interaction and sharing even without the development of highly innovative new technologies. When implementing these platforms, adopting an agile methodology, which is optimized with regards to the rapid creation of prototypes, strong on interaction and feedback and sensitive towards project management needs, will, according to our results, add additional value. On a meta-level, we

found our own method of crossing disciplines and areas of application to be mentally stimulating but very productive and fitting for our specific topic of innovation and community building with social media tools.

Correspondence

Stefanie Quade
Email: stefanie.quade@hwr-berlin.de
Tel.: 0049 176 10 54 10 28

REFERENCES

- Atkins, D., Brown A. and Hammond A. (2007) *A review of the open educational resources (OER) movement: Achievements, challenges, and new opportunities*, Hewlett Foundation Report; online: <http://bit.ly/124mnc8>
- Avison, D. E. and Fitzgerald, G. (1995) *Information Systems Development: Methodologies, Techniques and Tools*. 2nd edition. London, McGraw Hill
- Birkenkrahe, M., Scholl, M. (2009) *Konzipierung von modularen Weiterbildungsangeboten für KMU an der Schnittstelle von Technik und Kultur zum Thema "Internationales IT-gestütztes Projekt- und Wissensmanagement im multikulturellen Umfeld"*, Berlin School of Economics and Law, Technical University of Applied Science Wildau
- Birkenkrahe, M., Habermann, F., Quade, S. (2012) *Manage Projects Smarter: Picking Tools for Small and Medium-Sized Enterprises* in: Proceedings ICELW 2012 - International Conference on E-Learning in the Workplace, New York
- Birkenkrahe, M., Kjellin, H., Quade, S. (2011) *Applying a formalized context to inspire people to develop transferable descriptions of knowledge* in: Proceedings of the 5th GUIDE International Conference Rome, Italy
- Birkenkrahe, M. (2013a) *Wiki for the B.A. course "Betriebliche Informationssysteme für Wirtschaftsinformatiker mit Übungen"* [Business information systems with exercises], summer term 2013; online: <http://bit.ly/BisWikiSS13>
- Birkenkrahe, M. (2013b) *Wiki for the MBA course "Problem Solving 2.0—finding systemic solutions"*, online: <http://bit.ly/PSWikiSS13>
- Cohn, M., (2004) *User Stories Applied: For Agile Software Development*, Addison-Wesley Professional; Boston, MA 02116, 1st ed., p. 45
- Checkland, P. B. and Scholes, J. (1990) *Soft Systems Methodology in Action*. Chichester, John Wiley and Sons.

- Engelbart, D. (1962) *Augmenting Human Intellect*; online: <http://bit.ly/124liRn>
- Guth, S. (2007) *Wikis in education: is public better?*in: Proceedings of the 2007 international symposium on Wikis, p. 61-68.
- Tacke, O. (2013) *Seminararbeiten in öffentlichen Wikis verfassen – Einschätzungen aus der Perspektive von Studierenden und der Lehrperson im Fach Betriebswirtschaftslehre*, unpublished; online: <http://bit.ly/16ZBtAY>
- Goodwin, B. (2012) *Shell plans to save 100s of millions with 'semantic' search*; in: computerweekly.com; online: <http://bit.ly/10Ybm5A>
- Kalakota, R. and Robinson, M. (2000); *E-business 2.0: Looking Over The New Horizon*; EAI Journal, October 2000.
- Karve, V. (2009) *Root Definition & CATWOE model*, <http://www.articlesbase.com/human-resources-articles/root-definition-catwoe-model-1517634.html> (online retrieves 20.07.2013)
- Lewis, P. (1994) *Information-Systems Development*. London, Pitman Publishing
- LifeChurch.tv, (2009): *babelwith.me*, <http://www.babelwith.me/>
- Maani, K.E. and Cavana, R.Y. (2000) *Systems Thinking and Modelling. Understanding Change and Complexity*. New Zealand. Pearson Education
- Maurer and S. Martel. (2002). *Extreme Programming: Rapid Development for Web-Based Applications*, IEEE Internet Computing, 6(1) pp 86-91 January/February 2002.
- Ordanini, A., Micelli, S., and Di Maria, E. (2004)*Failure and Success of B2B Exchange Business Models: A Contingent Analysis of their Performance*; European Management Journal, 22 (3) pp.281-289
- Ordanini, A. and Pol, A. (2001) *Infomediatiion & Competitive Advantage in B2B Digital Marketplaces*; European Management Journal 19(3) pp.276-285
- Osterwalder, A., and Pigneur, Y. (2002); *AnE-business Model Ontology for Modeling E-business*; 1st B led Electronic Commerce Conference, Slovenia.
- Patel, S. (2012) *Designing Decision Support System*, London, www.lsbu.ac.uk, Lec 7
- Schwaber, K (2004) *Agile Project Management With Scrum*, Microsoft Press: Redmond.
- Skjøff-Larsen, T., Kotzab, H., and Grieger, M. (2003) *Electronic Marketplaces and Supply Chain Relationships*; Industrial Marketing Management 32, pp.199-210
- Teece, D. J. (2010)*Business Models, Business Strategy and Innovation*,Long Range Planning 43, pp.172-194.
- Wang, L. and Vidgen, R. (2007) *Order and chaos in software development : A comparison of two software development teams in a major IT company*,Proceedings of the 15th European Conference on Information Systems, ECIS 2007, pp. 807-818.
- Wilson, S.G. and Abel, I. (2000) *So You Want to Get Involved in E-commerce?*; Industrial Marketing Management 31, pp.85-94.

APPENDIX

Tables/Figures

Wiki questions

Pad Options Import/Export Saved revisions Time Slider

B I U [List] [List] [List] [List] [List] [List] [List] [List]

16 professor and all the students

17 • Absolutely appropriate - recommendable.

18

19 **3. What did you think about the support of this course via wiki?**

20 • It was different - at first I didn't like it.

21 • I am using this platform more than others (like moodle).

22 • It's more interesting to use wiki because all the parties participating in this educative enviroment, can add and give their remarks (like in the course).

23 • It's a bit difficult to get used to it and I do not like that it is completely open in the public. It's good to learn it and I see its trade-offs, but I would really like to not have my information accessed by random people

24 • At the beginning is difficult to know how to use it, but after get used to it (is not difficult is just practice) is a useful tool

25 • Well, since all other courses make use of old fashioned or traditional working styles, this is a refreshment and thus a motivator to train something new.

26 • It forced us to stay (constantly) close in the topic over the whole course. Which helped us to also not lose track.

27 • Wiki as a tool made group work more interactive and interesting.

28 • I finally found a reason to look into how wiki works and use it in real project. I had full control over the project and always knew, what is done and what need to be done, and can track all changes. Also class reports are nice.

29

30 **4. When you compare the support of this course through Moodle (largely through files and forum) with its support through wiki (text, images, photo protocol with comments)—which did you prefer and why?**

31 • wiki

32 • not sure. I do appreciate moodle - first, not anybody can log in so it's more controlable. Second, it's visually more pleasant to look at. The Wiki is not really beautiful, speaking on a design level, it looks a bit messy. It's interesting though to learn both and collect further tools.

33 • wiki

Marcus

Invite other users and they will show up here.

Share this pad

May 30, 2013

Marcus Birkenkrahe: Abstract (excerpt): Over 21:19 the period of two terms, we have experimented with supporting very different courses both at the Masters and at the Bachelor level using a Wiki as a well established platform and Wikiversity (Mediawiki) as a provider of so-called Open Educational Resources (Atkins et al 2007). Originally designed to overcome drawbacks of an existing closed learning management system, the Wiki turned out to be an excellent platform for real-time course support, course content extension, discussion and term papers creation and supervision. The use of agile methods known from software development as Scrum was an important process component for the success of this setup. Recent results by Tacke (2013) confirm some of our conclusions and prompt additional questions for further investigation. Source: Tacke, O (2013) Seminararbeiten in öffentlichen Wikis verfassen - Einschätzungen aus der Perspektive von Studierenden und der Lehrperson im Fach Betriebswirtschaftslehre, unpublished; online: <http://bit.ly/16ZBIAY>

July 21, 2013

Chat:

Fig. 1: Etherpad application used to solicit anonymous student views after the courses were complete. The chat window in the right hand side informed the students about the background for this study including a link to a background article whose access statistics could be checked.

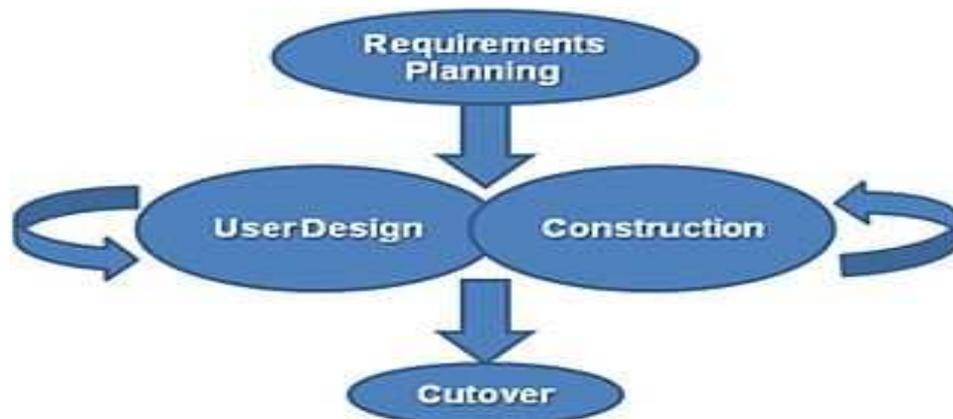


Fig. 2 Rapid Application Development (RAD) Model (Wikipedia, 2013)

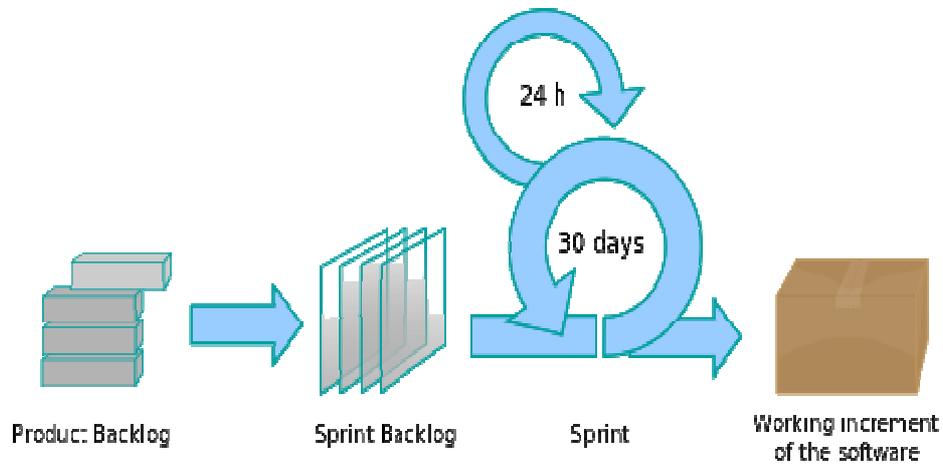


Fig. 3: Typical Scrum agile software product development process

	10. Apr	17. Apr	02. Mai	08. Mai	15. Mai	22. Mai	29. Mai	12. Jun	19. Jun
Update		Update	Update	Update		Update	Update	Update	
Create PRODUCT BACKLOG		Update	Update	Update	Prepare SPRINT REVIEW Presentation + Meeting)	Update	Update	Update	Prepare SPRINT REVIEW Presentation + Meeting)
		Meeting PO Meeting 2	Meeting PO Meeting 3	Meeting PO Meeting 4		Meeting PO Meeting 5	Meeting PO Meeting 6	Meeting PO Meeting 7	
					Update PRODUCT BACKLOG				Update PRODUCT BACKLOG
		Work on the PRODUCT	Work on the PRODUCT	Work on the PRODUCT		Work on the PRODUCT	Work on the PRODUCT	Work on the PRODUCT	
Create SPRINT BACKLOG					Create SPRINT BACKLOG				Create SPRINT BACKLOG
Create TASKLISTEN					Update TASKLISTEN				Update TASKLISTEN

Fig. 4: Term schedule for Scrum student teams detailing activities during sprints and on each of three sprint reviews.

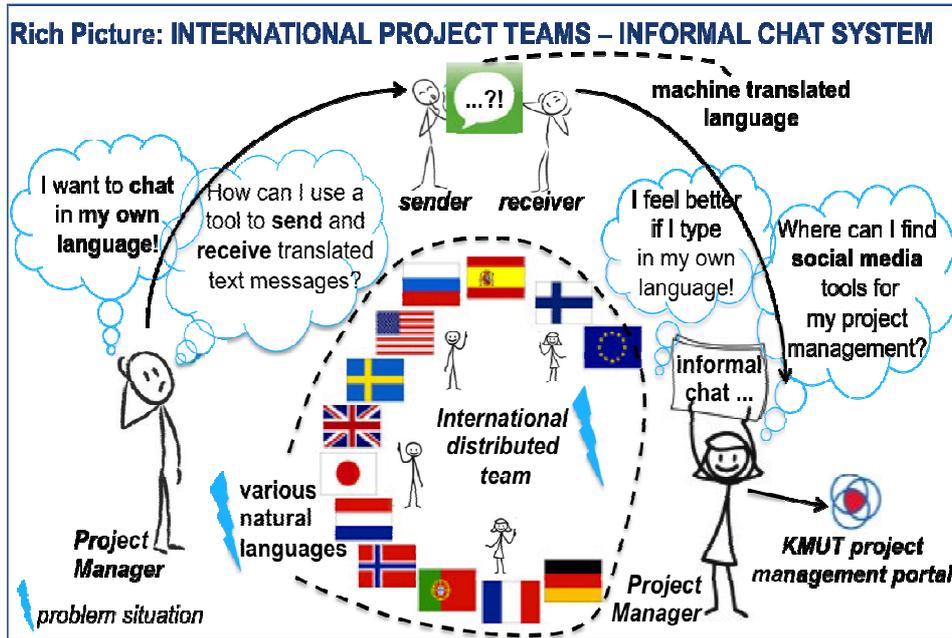


Fig 5: Rich Picture (Checkland, 1981), problem situation summary

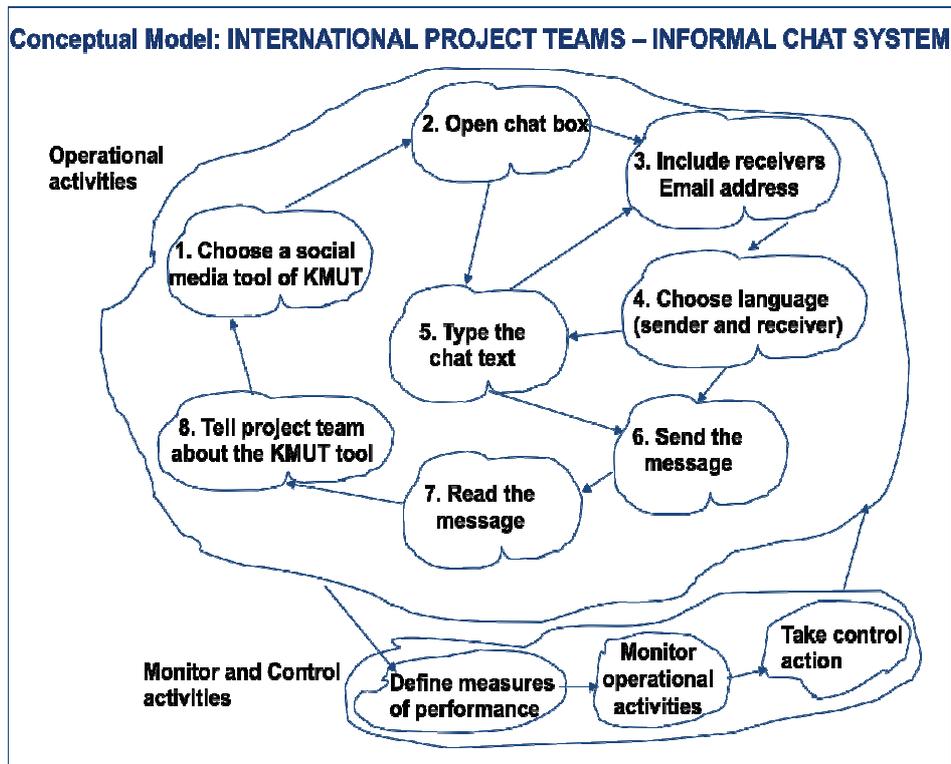


Fig 6: Conceptual Model - Double Loop of operational and monitor/control activities

