Supporting coordination of everyday project

Evaluation and design of Tabula

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Abstract

This paper argues that currently there is a lack of powerful and easy to use, coordination support systems designed for non-professional users. To address this problem this paper proposes a novel approach to the coordination of projects. The approach is based on integrating minimalist task workspaces in web-based Task/Participant tables. The paper presents a further design of Tabula, a web-based coordination system that implements this approach. The concept and prototype of Tabula was explored in two user studies employing the focus group method. The groups included subjects that were active, respectively, Master students in HCI and high-school teachers. The results of the focus group will be presented and discussed. The improved version of Tabula implements novel interface- and coordination functionality as well as an alternative e-mail based interface.

1. Introduction

Internet and IT has become a major tool for people in their everyday life. Nowadays people have opportunities to do work from home or when traveling, both in their hobbies and profession. The area of CSCW, and related areas, has long been an active research- and development field, which has resulted in a number of tools to support coordination; however these tools are often developed for professional users.

At the same time collaboration technology used by non-professional users is often different forms of communication, such as; phones, e-mail, video- and text chat. These tools do not give the necessary support for project coordination. The user is instead left with the option of using professional coordination tools that are highly complex and difficult. These coordination tools are neither designed for every-day projects nor simpler types of work-related projects.

Therefore the goal of this paper is to create design specifications for a coordination system, called Tabula, which addresses these problems. A previous version, which was previously developed by the author1 (see Björnfot 2009), is evaluated and used as a starting point for further development.

In order to create design specifications, questions concerning usability and users “needs”, will be explored. This paper will begin with an overview of systems and research in related areas to this paper. The paper continues with a brief presentation of the previous work done within this project. Two evaluations of the system will also be presented. The last part will discuss a re-developed system in which the functionality and features will be based on previous sections.

1.1 Overview of existing research and system

There are a number of research and systems that are related to this work. These systems are developed both in commercial- and research- areas. In this section an overview of related

1 In the earlier study, this tool was called “CollMX”
systems and research will be presented. Mainly the research stems from the field of CSCW and studies dealing with related topics. The systems include; Bug trackers, Project Management, Learning management and individual task managers, but also different kinds of communication systems that are of relevance. As will be showed, these system categories are rather flexible.

BSCW is one of the most famous project management systems. The BSCW system has been used in a wide variety of organizations. BSCW has also been branched into a CSCL-system called Synergeia (Stahl, 2004). Other systems aimed at having project management support, similar to BCSW, include Lotus Notes and Microsoft Sharepoint. Also related to these more pure project management systems are “bug tracker” or “issue managers”, that is aimed towards software developing projects. Examples of such systems are Jira and RedMine.

Another influence for this paper is Learning Management Systems (LMS) like: Moodle, Sakai, FirstClass, PING PONG and Fronter. These systems are designed to support learning activities. Similar to bug trackers the LMS is specialized on a smaller part of the organizational spectra. The special features of LMS are often related to support of pedagogical- and feedback- demands. Often seen in these types of systems is a structure of a course with a number of assignments and a number of participants, and all the participants are supposed to do all the assignments. A previous version of Tabula was evaluated in this type of learning environment (see Björnfot, 2009).

Another relevant category is single-user task managers, such as the Task Manager (Kreifelts, 1993), Google Task and even really simple to-do applications. These systems are interesting because they solve partly the same problem as multi-user collaborative systems. Similar to these systems are other Personal Information Managers such as digital calendars. Calendars contain entries similar to tasks, however they focused to keep track over where the user should be, what the user should do and on what time. There are also calendars with multi-user capabilities such as Google Calendar.

The categories that are used for these kinds of systems seem to be made after the goal of the systems and not after technological aspects. This is visible when comparing the systems with each other. If one compare traditional project management system like BSCW with Jira one can clearly see the project management capabilities in Jira. Both of the systems have support for coordination, sharing information etc, however Jira is aimed at software development projects, and thus have special functionality.

A simple underlying pattern of how project is represented seems to exist. Projects consist of 1-n participants (including different roles in the hierarchy), 1-n tasks and 1-n participant is assigned to a particular task. These tasks can be translated into bugs and issues. This simple pattern can easily be extended to explain learning management systems; each course consists of 1-n students and 1-n assignments. A difference however is that all the students often do all the assignments individually. These individual work do not relate to others individual work.
The pattern is similar for a student group work; in this case the class is divided into groups instead of individual students, although a big difference between projects and courses are that the project have a more fluent and flexible nature. This flexibility, compared to courses, is present in deadlines, roles, and task assignments. The way that a participant deals with a task in Project and Learning -management systems are similar to that of a single-user task manager. If a user does not act as a coordinator, the multi-user systems will be used in a similar way as a task manager, except the user is assigned tasks by other people.

Many studies have suggested that the general users uses e-mail for coordinating projects (Ducheneaut & Bellotti, 2001; Plaisant et al, 2004; Belotti et al., 2004; Bellotti et al., 2005; Gwizdka & Chignell, 2004). E-mail is a communication tool. Communication together with Coordination and Cooperation is a part of Collaboration (Borghoff & Schlichter, 2000). The term communication is not to be seen as a synonym to coordination, but as one of three facets of collaboration. E-mail is thus a communication tool that is often used for coordination; Ellis et al. (1991) call this conversation based coordination, where the conversations in this case are mediated through e-mail's. This is not surprising since the main collaboration tools for the general user belongs to the communication category. Communication is so deeply rooted in humans and thus exists also outside the term collaboration.

E-mail is a simple communication tool. An email consist of “sender”, “receiver”, “subject”, “body” and “attachment”, the subject and body can be filled with all kinds of text-based information, and any sort of file can be attached. E-mail clients also have “saving features” for both incoming and outgoing mail, often added to this is possibilities of storing mails in folders. This rather free structure results in a high flexibility. There is however a number disadvantages with e-mail. For example, e-mail does not have support for keeping track of deadlines, participants and pending tasks (Bellotti et al., 2005). Related to this is that all messages are not tasks and all tasks are not messages. There is also an extensive e-mail overload that makes it even harder to find relevant information. Because of this problem some people have developed strategies for coping with pending tasks in e-mail (see Bellotti et al., 2005). These strategies are often related to where users save their information, e.g. using folders, or mark read mails as “unread”.

Due to the limited project management capabilities in e-mail, a number of tools have been created, such as: Role manager (Plaisant et al., 2004), Task Master (Belotti et al., 2003), UMEA (Kaptelinin, 2003) and Task View (Gwizdka & Chignell, 2004). Task Master and Task View are adding task management in e-mails by creating views for these tasks. The Role Manager aims at solving the problem with having several roles that blends when using computers. For example a person can be a project leader and teacher, when in the role of a project leader, the user can send and receive e-mails related to his or hers teaching role. UMEA's scope is aimed at categorization of information related to a certain activity or project.
Task View, Task Master and Role Manager is all focusing on adding functionality to a certain e-mail client, this imposes some problems. First of all, the e-mail clients become both a coordination tool and a communication tool, which means that the simplicity of e-mail clients can be lost. The second problem is that e-mail applications are often deeply rooted for the users, i.e. the users can be negative towards changing e-mail client. Especially, when the direct benefit for the individual is limited.

There has been some noticeable work that aims towards understanding why Groupware and CSCW-systems fail. Grudin (1994) present “eight challenges for developers” developing Groupware. For this work three of the challenges are highly relevant, the other five is more focused at the implementation of Groupware into a certain organization. The three challenges are; Work vs. Benefit, Critical Mass & Prisoners Problem and challenges in Evaluation. The Work vs. Benefit challenge simply means that a particular artifact can be good for the organization, but the users are negative towards the tool because they do not benefit directly when using the tool. The critical mass challenge means that there are a critical number of users in order for the organization to benefit from the system. The evaluation challenge highlight the complexity of the usage compared to a single-user system. The main core for solving these problems is to have a good understanding of the organization that is going to use the software. The problem will be further discussed in a later section of this paper.

Research further shows a fluent and rather unstructured nature of how people coordinate projects (see Harrison et al., 2005; Ackerman, 2000), arguments that also finds support from the e-mail usage. This imposes design challenges due to that the tool must be flexible and not enforcing too much structure; this is a catch 22 since a coordination tool represent a structured side of project work. Ackerman (2000) also points out the Socio-technical gap in CSCW research and development. In simplicity this mean the gap between what the people need and are currently doing, in comparison to what the system does. This concern also relate to the difficulty of evaluating multi-user applications.

Another important research for Tabula is about “awareness”. The term awareness is meaning that the participants should be aware of what other participants is currently doing and act after this information. A number of studies have been done in the important aspect of awareness between participants in groups (Dourish & Bellotti, 1992). A number of systems have been researched in order to increase awareness such as Portholes (Dourish & Bly, 1992). In Portholes, a system consisting of a number of cameras where putted into an office environment, the participants was then able to see their colleagues through the camera system. This is strongly related to coordination since people are coordinating themselves after others.

In this section a number of discoveries has been highlighted, these imposes both design problems and design possibilities. These findings will be used in the design specifications.
2 Empirical studies

This section consists of a brief introduction of previous work; a section about evaluation of CSCW-systems and its challenges will follow it. Finally two focus group studies will be discussed. In this section the second ground, namely empirics, will be formed. In earlier sections, others work was exterminated, in this section, Tabula will be in focus.

2.1 Earlier Project

The background of this project is Björnfot (2009). The paper presented and evaluated the basic concept behind Tabula. So in other word Björnfot (2009) is a proof of concept for the system solution.

The basic concept is to utilize a simple table-style interface aimed towards being user-friendly and minimalist, see figure 1. The figure is the teachers view taken from the empiric evaluation conducted in the previous paper. The idea is to have a table where the participants are listed in the left row and tasks in the top column, the assignments are ordered after deadline. Where an assignment and a participant meet is a workspace containing the information about the participants/assignment relation. Inside each cell are four sub-cells: tools, resources, submission and assessments. Gray cells symbolize inactive cells, which simply mean that the cells will probably not be subject for any more work.

![Figure 1: Course view](image)

For the students it looks a little bit different (see Figure 2). The edit functionality of both the assignments and individual cells are removed and the only participants that the users see are themselves. Also added to the view is an upload button instead of the download button. The upload button is gray if the cell is inactive.
2.2 Methods for evaluating CSCW-systems

There are a number of challenges when carrying out evaluations of CSCW-systems. There are several studies that suggest using ethnography as the primary evaluation method (see for example; Grudin, 1994; Benyon et al., 2005). These concerns relate to the increased complexity in multi-user systems compared to single users. In this work there are however two concerns with using ethnography. The first one is that it is highly time and work consuming. The second problem is that Tabula is not enough developed to meet the necessary requirements of security, privacy and stability, that is needed for a real project work.

The method chosen for evaluating Tabula is instead focus group. A focus group is a qualitative study where a group of participants discuss a product. A typical focus group has three to ten participants and one or more facilitators; the facilitator’s role is to control the discussion (Preece et al., 2001). The goal with the studies conducted is to find problems and possibilities that can work as a ground for the final design. When developing Tabula it is of uttermost importance to have connections to user groups in order to “measure” different usability factors.

2.3 Study 1 – HCI Students

The focus group consisted of six participants. All subjects where master students in HCI. The group was aged from 20 to 30. The majority had experience in using some kind of project management tools. All the subjects were given a paper-copy of the system to sketch on. Also the system was projected on a white-board, which the subjects also could use to sketch on. The focus group was recorded with a digital video camera. This video was later analyzed together with the paper sketches.

The focus group begun with a short presentation, followed by a round of questions concerning Tabula and finally the main discussion. No concrete scenarios was given, instead the subjects were encouraged to make up scenarios for their arguments, although pre-made projects was used as examples during the presentation. The goal with this focus group was to get feedback on the interface layout/usability and on functionality for project management. The focus group took approximately two hours.
2.3.1 Result - Study 1
This section will highlight the major finding from the first focus group. The comments were mainly related to the user-interface, including esthetical as well as functional aspects.

The subjects believed that the project view was hard to survey. This especially when containing all participants and tasks, e.g. the “Project Manager’s view”. The reason for this was thought to be that there were too much information on the same page. In line with this, a number of solutions were discussed, these where: sorting-, filter-, search function, relocation of information, and visual clues of cell belonging. The sorting functionality aimed to sort participants after parameters such as “grade”. The filtering functionality was about hiding information and functions from the view, such as the tools or resources. The users also suggested moving the resources from the user/participant-cell to the “assignment cell”. By some visual enhancements the subjects thought that the cell belonging could be highlighted.

The icons were experienced as non-intuitive. The deadline data was confusing for some, mainly because it just was only a date. If it says “due” before the date, or similar, the subjects thought it would be better. The subjects also wanted some indication of how much time there is left. Suggestions ranged from changing the date to words such as “today” or changing colors depending on the time left.

The subjects were confused about the relationship between the upload and resources functionality. Many of the subjects thought that the resources were files uploaded by the participant. The subjects also wanted it to be possible to display resources inside the web browser instead of having to download files.

2.3.2 Discussion of study 1
Several of the concerns were about the project view containing all the participants and all assignments. This seems quite natural since the view is containing a lot of information. The underlying rationale for this view is to get a good survey over a project, therefore this problem is important to address. By adding filter and sorting functionality the user could control what information should be visible depending on the user’s goal.

The esthetics seem to be a quite relevant factor, the same type of feedback was given in Björnfort (2009). The esthetics is from an evaluation purpose not necessary negative, but can in fact be positive since users are more willingly to criticize a system that looks unfinished (Preece et al., 2002).

The icons as such have been redeveloped since the first study in Björnfort (2009), this repetition of the same concern shows that it is a challenge to design icons that are small and easy to understand. It is possible that the subjects concerns with the icons and the relationship between resources and uploads can be explained with the fact that they did not use the system “for real”. Even though the subjects perhaps would have understood it after a short period with the system, it is still rather unnecessary usability issues that therefore need to be solved.

The movement of resources from the user-cell to assignments is a rather complex
problem. The reason for having resources in the user-cell is simply because the resources can be unique for each participant.

2.4 Study 2 - Teachers
The second focus group consisted of 10 high-school teachers. The focus group was conducted during a time period of 90 minutes. The study was conducted together with another author (see Nilsson, 2010). The presentation was done with help of a projector and there were paper copies of the system handed out to the participants. The entire focus group was video recorded. This recording was later analyzed.

There was no detailed scenario’s made, but there was pre-made project, in a form of high-school courses, used during the presentation of the system. Some of the ideas from the first focus group was implemented in the prototype when this focus group took place, in other words, the system differed between the two focus groups.

2.4.1 Results – Study 2
The results from this study ranged between organizational issues, extended functionality and usability. The school is currently using the CSCL-systems Fronter, for sharing and collecting information, and FirstClass as an e-mail client. The main knowledge sharing is however done in face-to-face meeting. Only the teachers use Fronter, so the students do not interact with the system at all. The grading is done in another system. The subjects reacted positive towards that the students can login to Tabula in order to see their progress.

The subjects feel that there is a need for a national sharing database. This database should contain a wide variety of information such as tests exams and exercises. They mention the web-service “Lektion.se” where teachers can share information. However there was only one of the ten participants that had used the service. The biggest problem with the web-service was a lack of uploaded content.

The subject was positive about the saving functionality in Tabula. However they wished to have a way of discussing the saved material, so that the author of the project could make some statements about the material and that other users could give feedback.

The subjects thought that the importance of usability in a CSCL-system. The systems should be easy to learn and use, but still be effective in its daily use. They further stated that; “we don't have the time to learn and to use non-intuitive systems”. They thought that features of such a system are mainly based on drag & drop and they do not want to go through forms and dialogues when uploading files. Also the waiting time seemed to be an issue. One of the subjects did express that Tabula was intuitive and gave a better overview when compared to Fronter.

The subjects also believed that Tabula should not be limited to only students and teachers. Instead other people such as mentors and student counselors also can benefit from the information. Mainly this was related to information about a student’s performance.


2.4.2 Discussion – Study 2

The second study was more focused towards organizational topics then the first study. The subjects in the second study based almost every argument with previous experience as a teacher.

Lektion.se is a Web2.0 service that is trying to harness the intelligence of the users (O'Reilly, 2005). However for this kind of system a critical mass need to be reached, similar to Grudin's (1994) "critical mass"-challenge for Groupware systems. By having a direct benefit from using this kind of service will result in that the “critical mass”-problem is isolated to a part of the functionality instead of the entire system.

The comment function for saved projects can result in that the course content will evolve in a collaborative manner. Since discussions about the material can result in further development of this information.

The teachers wanted features that are common in operating systems, such as drag and drop. These features have been somewhat nonexistent when using a web-page technology, however this type of functionality are becoming more and more available, especially drag and drop inside the web-browser window. However one can draw the conclusion that the teachers want something that they are already familiar with and that there is a need for an easy-to-use LMS system.

2.5 Discussion of Studies

The two studies conducted in this work were quite different in many aspects. The subjects in the first study were students studying HCI while the subjects in the second study were active teachers. The focus for the first group was more aimed towards generating ideas from an HCI-perspective, similar to an expert evaluation. While, the second study was more focused towards a potential user group. Together with the fact that it was two different prototypes used, makes it hard to compare the results between the two studies.

However, to compare the data in order to create a general theory was never the goal. Instead the goal was to get feedback to use for further development. Since the scope for Tabula is a general user group, it is natural to evaluate with different user groups. Thus having two studies with such a difference in demography is rather positive, since they have different perspective of what a system like Tabula is and should do.

This data will, together with system- and literature study, be used to form the design requirements. When conducting this kind of studies it is not to generate the “ultimate truth”, it is about helping the designer to make a more qualified “judgments” over the how system should be like.

Using focus group as a method for evaluation Tabula seems to have worked well. The studies provided the designer with a lot of new thoughts and ideas for further development. Many of the topics generated in the studies were not even reflected upon before conducting the studies.
3 Re-designed System

The further development of the system is based on the results from the focus groups and literature review. This section will begin with a brief technical overview. It continues with improvements and presentation of the re-developed system.

3.1 Implementation and technical aspects

The system at this prototype stage consists of two primary subsystems, Tabula and a mail system. The main system is called SquirrelMail and is an open source system licensed under the General Public License. This means that anyone can get the program for free and can edit the source code, which make it ideal for prototyping. SquirrelMail is written in PHP and HTML and is run on an Apache server. The Tabula is written in Java, JavaScript, HTML and CSS. It uses MySQL as a database server and GlassFish as a web-server.

3.2 Design Improvements

On the basis of the literature study, earlier work and the two focus groups there have been changes in the systems. These improvements include both new functionality and enhancement of previous ideas. A number of problems have been solved and new ideas implemented. Figure 3 is showing the new system.

![Figure 3: Tabula used as CSCL](image-url)

The view is how the system looks in a learning environment similar to the one in Figure 1. As one see, there have been a number of changes that are both visual and functional. In the following sections some of these improvements will be highlighted and discussed.
3.2.1 Project View Enhancements

In Björnfot (2009) and the first focus group there were some concerns about the esthetical side of Tabula. The esthetics and colors has been enhanced (see Figure 1 for the old system and Figure 3 for the new). The visibility of cell belonging has been improved by making every second line darker, this in order to solve the problem with seeing what cells belong to whom. The issue was raised during the second focus group.

In the first focus group there was suggestions of improving the navigation between different projects, this was, during the focus group, done by going to a page containing all the active projects and from this page navigate to the desired project. In this new version of Tabula a banner is introduced that contain all the active projects (see top banner at figure 3). The project banner is visible in every view.

During the first focus group there was a number of ideas concerning filtering and sorting, in order to solve the problem of information overload. These filter- and sort functions have been implemented. The filter will remove unwanted fields from the cells. This so that the users can tailor the view in order to support their activity. For example, if a user only wants to see the grades of all the participants, then the user can leave the grade box checked and the rest unchecked, see Figure 4. The Sorting functionality will simply sort the users after the parameter’s given, the view in Figure 4 it is sorted after the grade.

3.2.2 Three types of systems

Tabula is developed to be able to support work in three different areas: Projects, individual task management and learning environments. These three are quite similar from a technical point of view even though the goal of the systems differs.

In order to have both projects and courses in the same view two different modes are created, Course and Project (See Figure 3 and Figure 6) and an individual task-view. The course mode looks like it did during the first focus group, but the project view eliminate the empty cells, created if one or more participant are not assigned to the same task (see Figure 5). In project mode the assignment row is removed (see figure 6). This information is instead in the resource-area. The column/assignment relation disappear, which means that the assignments in a certain column is not necessary the same.

![Figure 4: Filter and sort functionality](image-url)
The individual task manager is simply a view looking like one row in Figure 3. This view is personal and displays the users’ tasks. So this view is not dependent on project. Assignments in this view do not need to belong to any particular project either. To have a system reaching these different fields solves some problems with the critical mass (described by Grudin, 1994). But also, to support individual task management means that there are a direct benefit of using the system, for some users this can mean that they see Tabula as a single-user system that can be extended to multi-user and thus using the system without having to rely other users (Grudin, 1994).

3.2.3 E-mail integration
Since much of the coordination activities are conducted using e-mail, it feels natural to bring these two parts together. One way of doing this is to include e-mail as a part of the system, similar to FirstClass and Lotus Notes. However this forces the users to use a particular e-mail client. What is done in Tabula is instead to keep the unique features of an integrated e-mail client at a minimum. The idea is to have an e-mail interface towards Tabula. With this interface the users should be able to control a project.

There are mainly two types of situations in which this functionality will be useful. The first is when a user is using Tabula daily and receives a task by e-mail. In this case the Tabula user can generate a task from the e-mail. The second situation is when an inexperienced Tabula user needs to do a task for a project using Tabula. Instead learning the user to use Tabula for a simple task, everything can be mediated through e-mail. In both scenarios the persons not using Tabula is shielded away from the underlying system. This implementation of e-mail makes it possible for conversation based coordination and still utilizing the coordination specific features of Tabula.

The user can generate a task from an e-mail by simply open a received message and press “Add as task” (see Figure 7). This takes the user to a form (see Figure 8). The form is pre-filled with task name, generated from the e-mail subject, and the description, that is
generated from the body of the e-mail. The pre-filled form is simply to reduce the work needed to complete the procedure. The user can of course edit the pre-filled information and add a deadline. From a drop down list the user can choose which project this task belongs to.

A project manager can create a task by using e-mail. In this case the task gets “embedded” into the e-mail. Once having a task inside the e-mail it can be controlled from the e-mail client through HTML-links in the mail. This block of HTML can be generated both through the modified version of SquirrelMail and from Tabula itself. The procedure is basically the same for generating task from e-mail and to e-mail.

When being assigned with a task the user can hand it in for correction through an e-mail and the administrator is then provided links for grading.

Although the prototype is a tailor made for this concept, it is possible to send and manage a task in every e-mail client that supports HTML.

3.2.4 Saving Functionality
Some organizations have a need to save the project as a template for documentation and easy creation (Harrison et al., 2005). One of these organizational types is school environment. This was evident during the second focus group. Functionality for saving information is included into Tabula. The functionality is aimed at saving projects or tasks.

When a project is saved it includes all the tasks within the project, however individual assignment’s can be saved. The saving is done by simply clicking at the link “save project as template” (see Figure 3). The template can later be used when creating a course or assignment (see Figure 9).

What was evident during the second focus group is that there are some needs for communication about the material. Thus a simple comment field is added so that discussions, ideas and feedback can be communicated.
3.2.5 Unassigned tasks

In project work, a task do not necessary need to be delegated by one of the participants, there are cases where the participants assign themselves with tasks. The manager or other people that have interests in the project can generate these tasks. For these cases a “ticket function” is included into Tabula. The ticket system simply means that there is a list of unassigned tasks; these tasks are positioned in the last row of the table. Participants can then assign themselves with these tasks.

4. Discussion

Compared to the older version of Tabula, many improvements has been made, some of them are introduced in this paper. These improvements have their backing in two qualitative studies and studies of literature and systems.

The studies as such were conducted in order to create the final design. The argumentation for many of the design improvements comes from the focus groups. A question whether these arguments stand is then proper. The generalizations of data from these studies are relatively low, at least in comparison with the data demands one have if making a scientific theory. However, the data is collected in order to make design. The purpose for the studies is to avoid problems, see alternative ways and new possibilities. The design is about the real where science is about the truth, for further discussion see Nelson & Stolterman (2003).

The scope of Tabula has been broadened. Tabula is now including both project management, learning management and individual task management. It is both a multi- and a single-user system. Whether it is best to have a broader system or a more specialized is hard to say. However the single-user solution, I would argue, is good for the multi-user
functionality, especially if a user is taking part in more than one project. Then this user has a view for all of her assigned tasks.

The aim towards “general users” means that Tabula need to be simple to use and learn. How user-friendly a digital artifact is can be related to the amount and complexity of the functions. Since, an increase in functions can lead to a higher complexity. It can be so that one can make a good system for professional project management that still is really simple to use.

5. Conclusion and future work

In this paper a further developed version of Tabula is introduced. The new design is generated from empiries and literature studies. The literature- and system- study together with two focus groups generated problems and possibilities. The two groups, where of different demography, which made the study broader, and both the focus groups generated several of ideas. A conclusion of the evaluation method is that focus group seems to be suitable for evaluating systems that is similar and at the same development phase as Tabula.

Within the literature study a simple pattern over projects was discovered. It seems like this pattern can work as a good explanation for projects as well as courses, when designing a system aimed towards coordination in these areas. These discoveries resulted in new functionality and enhancements where developed, these included: esthetical improvements, sorting and filtering functions, project saving with comment functionality, overview enhancements and an e-mail interface.

Future work includes; developing Tabula to suit mobile devices, look for other sources for generating information and investigating alternative project roles. Tabula also needs to be evaluated in a real work setting.

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