THREADS

A tool to support the integration of user centered design into the scrum process

JANINE BENKER
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A tool to support the integration of user centered design into the scrum process

Bachelor thesis

*in cooperation with Nokia Gate5 GmbH*

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Foreword

„Interface Design? What is that supposed to be? What do you actually do?“

I can not even count anymore, how many times I had to explain my subject of study, my daily tasks, and my job in general to a novice, who wasn’t familiar with this field. But to be honest, I do not even know myself, how to describe it. It is not that we only design the interface of digital products. Interface Design belongs to the group of interaction design, usability studies and information architecture. Sometimes the borders vanish and a lot of us work interdisciplinary. Our goal is, to make products usable, experienceable, interesting and aesthetic. We are the symbolic interface between Producers and Users.

The “Interface“, there it is again. But this type of interface is easier to describe. This time, we are the ones, who want to support communication by using design and research oriented tools. Communication between managers, who follow their business driven goals and the engineers, who do their jobs until they reach technical or personal limits. Furthermore we want to improve the communication between managers, engineers and customers, or rather users. This we want to achieve by making the product the organ to send the user a message. A message, that says: “Look, how I can improve your life“, „Look, how easy to use I am“, „Look, how beautiful I am“. And it wont definitely last long, until the user responds.
This Bachelor thesis is written in cooperation with a globally operating telecommunication enterprise.

The structure of this thesis consists of roughly three parts. The first chapter provides the reader with background information in terms of brief descriptions of important terms. Following this the problem that this thesis relates to is described in detail and analyzed. The question is this: how can user experience can be integrated into an iterative agile software development process (scrum)? A short description of the current status of the enterprise, additional information, history and research material are presented.

The second chapter deals with the actual concept of finding a solution for the problem, described in the first chapter. Important content, that needs to be taken into account is presented and structured. Furthermore the author develops a concept for a software, in functions close to a workspace, that essentially provides a better overview of work inside a team. The author tries to work as closely together with the users as possible and after the first rough final concept is created, runs some tests to identify the needs of improvements. The results of the tests are included in the later concept phase and also in the following visual design part.
Introduction

First of all, something has to be revealed to the reader of this bachelor thesis with the title „Visual guide on how to integrate Usability methods into the scrum process“. The meaning of the term „usability method“ has to be seen as a part of user experience methods. According to this, additional parts of user experience could be mentioned in the following thesis. In this context, user experience describes methods, conceptions and designs, that improve the usability and overall experience of a product. This product can be physical or virtual. In this particular case the author approaches virtual products. In fact, to improve the comprehensibility of the issues, that will be covered, a tele communication company will be used as a case study.

The following bachelor thesis addresses a problem, which on first sight seems to need a solution coming from the field of product management. However there are several other ways of solving this specific problem, which might not match a conventional approach. The problem that we are dealing with might be familiar to
a lot of other user experience professionals. To those, who work for a big company and who work in a team with software developers, software testers and of course product managers, for example. For most of the UX professionals, presenting and delivering research and design material to the team has never been an easy thing to do. Developers say that it is not possible to implement something that has been designed on solid user research. Alternatively, perhaps the product manager does not support a number of usability tests, because he does not find it necessary for the economic success of the product —— Although customers will most likely be users.

Nowadays several business consulting companies try to find a way to improve and therefore accelerate software development processes. One of these processes, that has been used more and more in the past years is the scrum process, which will be described briefly in a later paragraph of this chapter. Referring to previously described problems that a UX professional inside a team has to deal with, conceivably working in a scrum team is an even greater challenge.
Basic Information

Scrum Process

History

Originally invented by Hirotaka Takeuchi and Ikujiro Nonaka for Toyota in 1986, Scrum is an incremental and iterative agile development process based on small teams and limited time frames. Compared to the waterfall process, which used to be the most commonly used software development process, Scrum uses iterative phases which are almost like small repeating waterfall processes, to be more flexible. The waterfall process describes a fairly static linear long term process, including conception, initiation, analysis, design (validation), construction, testing and maintenance of a product. Each following phase is dependent on the previous.

Within Scrum the team works in two to four weeks sprints, in which they develop a small part of the software. Eventually multiple parts can be combined in a release sprint (see below for a more detailed description of sprint) to complete the software or a bigger part of it. This depends on the size of the software.

Different team members

A team should never include more than nine members. It contains a set of roles that are executed by team members to structure and organize the iterative time frames. The initial role inside a team is the product owner. Before the beginning of a sprint, a product owner creates user stories, which serve as the foundation of all parts of the development that is done in the sprint. Additionally there is the Scrum master. The Scrum master is not usually a team member. Their role is to maintain all ongoing actions and to take care of environmental conditions, which are necessary for a good work cycle. The team itself usually contains two different types of professionals: developers and software testers. However in this thesis, all following descriptions are based on the experience inside a team, that includes designers as well.
A sprint starts with a meeting called sprint planning. Within this meeting, the product owner presents the user stories. These user stories are collected in a so-called product backlog. All team members give story points, as a metaphor to estimate the overall time of completion to fulfill the conditions of a story. After a certain amount of stories and story points have been reached, the team members have to define their own tasks inside the chosen stories. They also need to estimate in realistic units of time, how long they will work on each task. Every task is collected in an artefact named sprint backlog. From there, a task is put into a burn down chart, that includes sections with labels, such as process, review and done. During the following weeks, the team meets every day in a short meeting, called stand up. Every team member talks about their daily achievements, impediments and prospective work.

At the end of the sprint, all work, that has been done is reviewed inside a meeting with people from other teams and management. Afterwards the team for itself meets to reflect on the past sprint. Following this, the next sprint starts again. As one can imagine, the overall process is on a tight time schedule and does not leave much space to further activities and learning experiences. Therefore a thing called spike is part of the sprint. Spike is like a time out, in which a team member can learn and experience new things, that are helpful for further development tasks.
Coexisting processes

Not only the code driven part of a product follows a certain development process, also everything concerning the design is based on a progress cycle. User centered design, especially, has specific actions. These actions lead to a final design solution, that fits the users need regarding a software product. However there is a big difference between the scrum process and user centered design process. Whereas scrum is essentially built upon creating small pieces of software that will finally be put together to a whole product (within the user centered design), the actions inside the process rely on the “whole picture”. An overview of the complete design has to be kept in mind to create combinable visuals and consistent functionalities.
User Centered Design Process

In this part of the introduction a few of the main user experience methods will briefly be introduced and described. These methods are used to create a design which is based on users’ needs and would also work inside the company’s scrum team. There are several methods for certain states of a user centered design process. The process mainly includes a research and analysis phase; a concept phase; and a design phase followed by the development and implementation of a design. These phases can also include small iterative life cycles of analysis, creation and testing.

Research and Analysis

User research starts with observations of people in their everyday life. Of course you always keep the product in mind, but the research happens in a natural, environmental context and puts the focus on people’s natural behaviors. Contextual inquiry refers to this type of research. Observing potential users and always thinking about the aim of the product.
Concept

Personas
Personas is a method that is used by creating character profiles that represent the typical users. Usually such a profile is created upon contextual inquiries or interviewing people about their habits and opinions in terms of certain areas. Assumption personas is a quick and dirty version of the regular personas, which is created only by experience and assumptions of the UX professional.

User scenarios
With the described personas it is possible to write user scenarios. For each user type, a typical scenario is created, that supports the characteristics of a persona and leads to the connection with the product. Scenarios can picture daily life, personal habits or exceptional situations.

Use cases
Use cases are something, that is known from software development. In correlation with usability, use cases describe how users perform tasks within the product. Personas can be used as representatives for users. Use cases can describe how many steps it takes to accomplish a task or how the product should respond to a users action.

Storyboards
To visualize scenarios or use cases often storyboards are a very common tool to improve the perception of a topic. Originally used in the movie industry to visually support a script, so actors and movie makers can assimilate to the story, it is also quite helpful in software development. Team members can relate the product to the end user.
Design

Using user research and taking into account the requirements, that are made by a company's management department, the user experience professional can start to create a first information architecture. This architecture organizes the important content of a digital product, that needs to be delivered to the user and also describes navigation flows between different parts of content.

According to the overall navigation structure, it is essential to start the interaction specification, which puts the direct human computer interaction into a concrete graphical and textual description for the developers and visual designers. Information architecture and interaction specification are inseparable and are mostly done by one person.

When all specifications are done, the user interface design/visual designer can start creating design specifications and deliver these together with necessary assets to the developers. User interface designers are also generally responsible for creating prototypes for usability tests. Including paper and flash prototypes.
Adapt

Prototyping
After a product has been created, there can be a first small usability test with prototypes. In fact it sometimes does not have to be a digital prototype, even a paper prototype works as material for the testing.

Expert review
Every now and then it can be very helpful to have a person perform an expert review prior to testing. Generally speaking, this person will be a UX professional themselves, but not directly involved in the development process. As the term implies, the software/prototype will be reviewed by someone, who knows what to pay attention to.

Usability benchmarking
Another method, that is quite convenient to do before testing a product with users is usability benchmarking. The benchmarking can either be practiced internally between different design versions or practiced against a competitor.
Measure

There are basically three different types of usability testing. One of them is the “in-lab testing”, meaning it is a test session hold in a laboratory with tools to support and record the session. A very specific test method is RITE (Rapid Iterative Testing and Evaluations). “It emphasizes extremely rapid changes and verification of the effectiveness of these changes” For example, there six participants for a whole day of testing and if there are any issues noticeable after the first participant, it will already be changed within the product, so the second participant gets a different version of it.

Something that gives a better feeling for real life use case is field observation. The product is handed out to the participant and should be used it in a natural environment. Of course with tasks, given by the usability specialist. Differently from the observed field testing is a long term study. In this case, the participant gets a released version of the product and is asked to use it for a couple of weeks in his daily life. To get results from this, the participant usually has to write a diary and regularly come into a lab for short testing.

Another quick and easy, but not so trustworthy method is a simple questionnaire. This questionnaire is handed out to people, who already use a product and they can answer the questions according to their experiences and rate the product itself. This method is quick because it does not need any guidance or actions from the usability specialist. It is not so reliable, because users usually tend to rate things more positively than what it actually is.
Problem Description

As mentioned in the introduction, this thesis will relate all research and concepts to the experience amassed inside a specific enterprise.

With the author being present at the time of introducing the scrum process to a team (that had not had any experience with it) it became apparent that it would be quite a challenge to integrate the user experience into this process. Not even the coaches, that were introducing the process to the company, had satisfying answers to this.

Without any research, the team tried to solve the problem by itself. Integrating the design part was not so difficult. Doing the same with the rest of a user centered design process proved more difficult. The problem still has not been solved. There are several major issues, that need either to be newly introduced, changed or simply be improved.
Introduce things

*Known methods do not match the demand of a short time frame working process*

Everyone inside a scrum team is on a really tight time schedule. Tasks have to be finished, so somebody else can use the result to complete his or her own task. Usually a team member does not work longer than one to two days on one task. This speeds up the production process, but it does not leave much space for professional reviews and feedback from users. It is difficult, to integrate the standard, well-known user experience methods, because most of them are quite time consuming. Which, in fact should not be seen as a problem, since a lot of issues can not be detected within a certain scale.

For example, some usability issues become less crucial, if the learn ability of a product is good. This can only be found out in a long term study. Within sprints, that do not exceed four weeks, there is no opportunity to do such a study. Instead it is necessary to create new types of user experience methods, that match the demand of an iterative and short term working process. Chris Nodder and Jakob Nielsen from Nielsen Norman Group have written a paper titled: “Agile Usability: Best Practices for User Experience on Agile Development Projects”, that describes a new approach to this topic. This approach should be taken into account, when trying to solve the problem of integrating user experience into an agile software development process. The paper deals with the modification of existing methods, such as personas. Instead assumption personas, described as thumbnail sketches of users of the system, which have less levels of research, should be sufficient enough. The paper also introduces specific quick and dirty methods such as RITE (rapid iterative testing evaluation). A detailed description can be found in the next chapter. This paper and the knowledge it provides, will make it possible to take one step further towards an improved integration of UX into the scrum process.
Change things

*New working time schedules of different parts of the team are difficult to be combined*

But only following advice from other professionals will not secure a successful development. Sometimes, issues are very specific and can not be adjusted to a ready made problem-solution. In this case it is necessary to change things internally and find the best fitting solution.

Inside the organisation that this thesis relates to, one of the major problems that emerged when introducing scrum, was different work cycles. People were used to receiving tasks from the manager, fulfilling the task and then forwarding the result to the next person. When the first sprints started, the team members (especially designers) did not know when to start their work, what exactly was needed and how much time they had. It is a principal of the scrum process, that in the beginning, a lot of things do not work the way they are supposed to. But all of this mostly relates to software developers. No one gave any advice on when the usability specialists should do their testing. Which means the development process of this feature would have to stop during the testing period, and the developers would need to have something else to do. To find an appropriate solution and to align the different work cycles, it needs someone with an inside view of the organisation’s rules and habits. In a later chapter, the author presents a visual of a personal approach of aligned work cycles inside the organisation.
Improve things

The team is not working a user centred way, because of lack of information and communication

If one wants to adjust something existing to something new it is not always the best way to start with the obvious challenge. Most of the time, this leads into a wrong direction, because it might help the adjustment temporarily, but it does not promise a long term success. To achieve this success it is helpful to listen to team members, analyze their daily work and do some research on their interactions inside the scrum process. In the context of integrating user experience methods into this process, it was also profitable, to do a brainstorming session with several team members. The outcome of this session proved that there are still problems inside the team, that on first sight might seem fundamental, but in the long term could be the key to a successful integration of user experience methods.
After evaluating and summarizing the major topics, the following are the resulting issues.

Focus on own work

Different parts of the team work within their own groups. Team members do not know what the others are working on. Mostly because the drive of their work goes into different directions but also because they cannot see the direct connection between their work. Furthermore, team members substantially fulfill their tasks and refuse to inform themselves about things that occur outside their personal work environment. Lack of time and fear of higher hierarchies are the common reasons. Another issue noticed is the lack of communication between team members.
Spacial separations and a lack of time to talk directly to others causes a lot of misunderstandings. Additionally different cultural backgrounds worsen the situation. Even though English is the shared language and most of the team members speak it fairly well, different pronounciations and accentuations lead to further misunderstandings. These again can cause unintentional mistakes within the product development process.

But not only the lack of communication inside a team, also in a greater context, between individual teams causes the failure of combining code and design to build the whole product. The work is not aligned because people do not know what the other teams are working on. This eventually leads to inconsistent and incompatible parts of software.

Focusing on the part of user experience and its impact on the lack of communication inside the team demonstrates some points that can be improved in the future. On one hand, the user experience professionals have a hard time representing the users’ perspective inside the team. Team members do not take it as seriously as they should. But for understandable reasons: the UX-professional is not the user, just the provider of information. On the other hand the developers, software tester etc. do not have intentional contact with users of the product. Besides the product owner, team members have very limited access to research material. Eventually this will lead to a sceptical opinion towards suggestions made by the user experience professionals and product owner. Again, the team atmosphere will not benefit from this attitude.

Regarding these past three sections, the focus of the theoretical and practical application of this thesis is on the subject of improving things. Analysing the present state and developing a tool to improve communication and information flow, as the fundamental problem inside the team.
Breakdown Case Study

Before the author can start with a potential solution concept to the problem of miscommunications and lack of information sharing, it is mandatory to find out how things work currently inside the team. What is the current situation? Especially in the focus of user experience methods, what is practiced and shared? How do team members communicate right now and what are definite plans for the future? What is in the pipeline and needs to be considered within the later concept? Fortunately the on hand insights of the author make it possible to get information about the previous questions!
Current status

Currently there is one user experience designer and one visual designer inside the scrum team and usability work is done by a separate usability specialist. However this person works inside the organisation, but not inside the team. Also, all user research is done by teams in other countries that do not have a close connection to this part of the organisation in Germany. The user experience designer basically specifies the interactions and the overall navigation flow of a feature according to the user stories, that were given to him by the product owner. Usually he also considers usability testing results from older product versions, that he gets from an external agency or that he finds in the intranet on different wiki pages.

Afterwards he gives the specification to the visual designer and the developers. The developers can start working on the function and meanwhile the visual designer prepares the graphics. To sum up the user experience design includes: an information architecture and interaction specification, as well as a design specification with graphical assets. This information material definitely needs to be shared and communicated.
Besides from that, as briefly mentioned, a product is tested on its usability by an external agency. The internal usability specialist defines use cases, that apply to the demand of the product and sends them to the testing agency. Sometimes the organisation also provides paper or flash prototypes for testing. The appropriate agency prepares everything for the tests in close agreement with the usability specialist and then runs the tests. Tests are recorded as videos and one person takes notes during the session. Afterwards the material and personal observations are analysed and summarized in a presentation for the organisation. Especially for the team with the biggest interest in the tests. Either the presentation will simply be handed over to the usability specialist inside the company or a meeting with a personal presentation is set up.

With long term studies it generally works the same way. Only that intermediate analysis are prepared after a certain period of time. Adding up the information, that needs to be shared in terms of usability studies, it will be test cases, video material, possibly questionnaires and notes and of course the presentation files.

Not to forget, user research. Since the organisation, that this thesis relates to has no own user research professionals, not to mention a department, most of the research material comes from other parts of the company. So far as known, it includes observations and personas. To get this material, several emails need to be sent.
How does the current communication work?

Spending one day in the office of the organisation referred to, reveals that basically all common communication tools as email, messenger and phone are used. Which is not surprising! But how does the communication work in general? Also between team members?

Short meeting

Once a day, the team gets together in the daily stand up meeting to talk about the progress of each team member. Everyone speaks up and quickly presents her or his status. Everyone else listens, or at least tries to do so, until it is her or his turn. Sometimes it is obvious that some team members can not be understood very well. But to stay in the assigned time frame of the meeting, no one asks further questions. It is not in the principles of scrum. But did the inventors of scrum consider cultural differences?

Emails instead of talking

Despite the meeting, there is barely any time, when the whole team meets up. For a couple of months now, team members have been meeting outside the company for a beer or so. This already benefits a better understanding between team members. Sometimes in the office when the verbal interaction between two people does not work, they prefer to send emails back and forth. At least then one does not have the difficulty to understand a certain accent.

Messenger

E-mail in general is the most likely communication method used inside the scrum team. The disadvantage of it is that the sender always has to add a mailing list or specific addresses, if he wants to contact certain groups. Often e-mail pass by someone, who later on is lacking this specific part of information and has to ask again for detailed information. Besides e-mail, an instant messenger is another popular tool. Though it is noticeable, that it is mostly team members that frequently have things to talk about use this tool. Again, it is a very personal and limited information
sharing that is mainly happening between two people. Real face to face interactions, besides the daily stand up, are barely happening. It sometimes is just not possible, when space is limited and people work in different buildings. Besides, as the team is working in a telecommunication organisation, everyone is willing to use interactive tools to communicate with others.

Besides the internal communication strictly related to work the author noticed, that a lot of team members and also outside colleagues communicate through the facebook status report. People keep on posting their thoughts and activities and other people, who also work in the same team or company add their comments.
What are internal plans for the future?  
What needs to be considered?

Practically as with all enterprises, progress and improvements are desired. Plans for the future have been made by management and they will surely affect the development of user experience and the general team work. Since no real internal user research is done currently, the aim is to change this for the future. Practice more user observations, do more interviews and create personas internally and keeping direct connection to the product. Also they are preparing to build up their own usability laboratory - keeping more parts of the work internally and within accessible reach. The obvious goal is to maintain the personal commitment of the employees towards their work and the company in general.
Visual Approach to present an optimal workflow inside a scrum team

This poster of an information architecture, which visually describes a way to integrate user experience into the scrum process, provides an overview of certain connections within the process and also between the groups inside the team. It presents the connection points between team members, where well functioning communication is necessary. It supports the idea of finding a way to improve the collaboration between team members and the exchange of valuable information and material between development, management and design.
Research

In order to follow the path of improving the communication inside a team and support the information flow, it is necessary to have a general knowledge about human communication and information adaptation. Of course in the context of modern technology. One of the most common tools of modern technology, used in enterprises nowadays are wikis or server based workspaces. The following section gives a good overview of human communication in the connection with modern technology, how information provided by media is adapted by humans and the history and state of wikis and workspaces.
Human-computer-human interaction

If one thinks about communication, it is not anymore only about speaking with somebody. Nowadays communication between a sender and receiver is possible through diverse technological tools. People can interact with somebody on the other side of the earth and since the first commercial telephone in 1877 a lot has changed.

Claude Shannon, a research mathematician at the MIT in Boston, introduced a simple model of human communication, called the channel. The communication model consisted of a sender, a transmission medium called the channel, and the receiver of the message. Orville Leverne Clubb slightly modified the model for Human-computer-human interaction and defined the following components of the message. There is a sender, a receiver and the message of course, but then there is also the medium. The medium is the method, that is used to transmit a message (internet or phone network). He also mentions the noise as technical or linguistic obstacles, anything that interferes with the clear transmission of a message. The interpretation, as everything the receiver performs to decode and understand a message and finally the feedback, which the receiver sends as a reaction or response to the received message.

All modern communication tools, such as e-mail, VoIP, instant messenger, social networks and sms messages are functioning as described in the modified channel model. These tools have made lives easier, but also more complex. The fact, to be available 24 hours per day has become a problem for many people and caused an increasing number of stressed out employees.
For most people, who work in an office job, where they do computer or even internet supported work, it is hard to “shutdown”, when getting home after work. The separation of workspace and private environments has vanished. But on the other hand it makes it possible to do something like “home office”. Working from home, when the child is sick, or simply working as a freelance.
E-mail

E-mail has become the alternative to regular posted mail. Most of today’s informal and formal communication happens via e-mail. Only specific formulas or signature related letters are sent with envelopes and stamps. Sending an e-mail and receiving an answer happens much quicker and helps to prevent delays on urgent actions. Stevan Harnad, a cognitive scientist, stated that e-mail makes interactions much more focused and convergent. On the other hand the ease of use of e-mail has caused people, who sit together in offices, to not talk directly anymore - instead they are emailing each other. It has to be made clear though, that direct verbal interaction is still happening with the fastest speed.

Instant messenger

A phenomenon that can not be missing on a modern computer is an instant messaging service. Instant messaging is the fastest way of communication after oral interpersonal communication. Sending and receiving almost works as fast as people speak. The use of instant messaging has also changed the way people work.
They have adjusted to multitasking. When people work they can chat with people and while waiting for a response they work again. Therefore instant messaging interactions are often sketchy and less focused than e-mail interactions. Still in a less formal context, nowadays it is easier to keep in contact with people, when they live further away and one can have several different conversations with different topics. What has been noticed as a difficulty is the lack of verbal intonation and facial expressions, that stress out the meaning of something. To give hints, such things as emoticons or acronyms have been introduced.

VoIP with video camera

An application, that is not lacking the facial expressions and body gestures, is VoIP with a video camera. People can see each other directly face-to-face and basically speak as if they were standing next to each other. Although Orville Leverne Clubb says that the physical absence causes the participants to feel as if there is no threat. People feel more likely to express inappropriate messages, that they usually would not be able to say in a face-to-face dialogue. But in general it is most of the time easier to understand the sender, because the receiver can see his face.

Phone

Working the same way, but without video connection, is a simple phone call. Being the oldest way of communication from the above, it is an everyday thing, people do not even think about anymore. It is quite interesting though, that younger people today are talking less on the phone than the generation before. Instant messaging and social networks are the preferred communication tools. Also in technologically focused companies, the number of phone calls is decreasing.
Social networks

Social networks, an invention of the web 2.0 era, are probably the most used communication tools by people between 13 and 40 years old. My Space, Facebook, StudiVz etc. only to name a few, are successful platforms, that support online sharing of information, mostly of personally related things. Users have the possibility to contact friends directly via a “wall post”, a message or a simple virtual hug. Short status reports or just short info, that people want to share using a tool as twitter are the new form of info sharing. Older social networks like facebook have included such a feature with big success. People want to share things and want to be heard. Sometimes it does not even matter with or by whom.

Critical thinking

Having the choice, or even being spoilt for choice, between all the modern communication tools, sometimes opens up the question: What about really speaking with somebody? As good as these tools are, it still has to be used with respect and critical thinking. No wonder, companies organize special team events without any computers or cellphones to improve the team spirit and thereforr work environment. Being able to communicate faster, does not mean, that the understanding is better.
Information adaptation

“From the psychologists perspective, it aspects a lot in the favor of watching a film, as the best way to perceive information.” (Sabine Schroeder, SirValUse)

Adjustments of humans

Sharing information has been made easier and easier through modern technologies in the past decades. Still, analysing the way of information adaptation, it becomes clear, that humans use the same senses they have used before. They have developed the ability to use their senses much faster than in the past. They are adjusting to the increasing speed of information flow. But essentially people still speak, listen, write, read or watch to share information with others.
Considering modern technology hardware, like computers, cellphones, mp3 players etc., that people use to share information with others, there are still differences between the perception of this information. There is no doubt, that the more senses are activated, the more can be adapted. Also images are known to improve the understanding of something. When someone reads a textbook or listens to someone talk, only one sense is addressed. The memory of the content will not last very long.

It had been proven, that only ten percent of the information, that one reads, listens or sees will be kept in one’s mind. Instead, when watching a film, two senses are activated, watching and listening. Adding the positive effect of images, increases the ability to adapt the presented informations tremendously.
Taking a look at research in terms of web sites reveals again, that images are the main “eye catcher” on the sites. The first look goes to the images, afterwards the attention shifts to the text. Interestingly men’s attention towards images is even stronger than women’s.

Taking into account that we are using technological hardware, so far text on screens is mostly hard to read (besides Sony reader etc.). But looking at an image or even watching a film on a screen is something current generations are used to since they were little. However the memory of a printed text can also be supported by illustrated images.

Studies also support the fact, that the best way of adapting information is by creating it yourself. One remembers 90 percent of the things, that are developed by oneself, because it is memorised in a geographic frame. Not only because one uses
the common five senses, also because of coenaesthesia, meaning a special feeling for the physique of one’s own body. People keep things in mind, when it has to do with their own personality or something that is somehow related to them. This is why the use of tags is helpful and successful.

When the recipient becomes the participant, the endurance and quality of information adaptation changes. The best example are video tutorials. Not only is the user the recipient, by listening and watching the coach. He also becomes a participant by simultaneously practicing the presented actions with his own product. Which would at least be the preferred response.

People, who like to be auto didactic and try out several things, do not feel as if they are obliged to do something. They feel comfortable and that also improves the adaptation of information in the long term.
 Wikis and digital social workspaces

History of wikis

Wiki is a Hawaiian word, that means “quick”. Nowadays, almost everyone relates something different to the word “Wiki”. Wikis are known as web pages, that can be edited by everyone, who has access to these pages. But most of the people still think about “Wikipedia” the free content encyclopedia, that went online around 2001. But there have been pages like this before. Already in 1945 a microfilm hypertext system existed, with the name “memex”. Apple Computer as well introduced a hypertext system called Hyper Card in 1987. However these systems were only used within software companies. Influenced by the Hyper Card system by apple, Ward Cunningham started to advance the system by adding links to it, with which new content cards could be created.

Effect of Html

The development of hypertext protocols and the world wide web made it possible to distribute such a system to the outside and connect with other developers. Graphical interfaces also supported the development of the first wiki web site. Cunningham introduced a wiki named World Wiki Web, which had the aim to connect software developers to share knowledge and just experimenting. This happened in 1995. Later on, several copies of such a shared system started to exist and also with different target groups. Some only allowed the users to share text based information. But still these web sites were only known and used by the community of software developers.
As mentioned earlier in this section, in 2001 Wikipedia, the free content online encyclopedia was introduced to the general public by Jimmy Wales and Larry Sanger. The immense success of this wiki brought up the usefulness of such a system. More and more public wikis emerged for different target groups and with different content. Wikis, such as TWiki, originally only text based content, are popular web sites used by big companies. Some enterprises even have their own wikis.

**What content is shared on a wiki page?**

In general wikis have a similar content structure. Some are deliberately limited in the information that can be shared, but most of the wiki sites offer a big amount of possibilities. Usually text content is the main component of such a site. As with every HTML code, headlines, paragraphs and regular text can be created and displayed. Of course links, images and films can be implemented as well. Usually different pages are created to organize and separate different related content. These pages are mostly connected with a bread crumb or a navigation panel. In the following a few examples of wikis and online workspaces with their advantages and disadvantages are presented.
Revision control

TWiki has "Soft security" - anyone can change anything, but changes are logged. There is a complete audit trail:

- Version
- Date of last revision
- Person who made change

is recorded. At the footer of each topic one can click on previous versions. One can also see the differences between revisions by clicking on the > sign located between revisions of a topic.

See More Tips...

--- TWiki:Main.PaulineCheung - 30 Jan 2005

Twiki

Twiki is a mainly with perl developed open source wiki-software, that is used in medium to large sized enterprises. It is used to share knowledge and documents.

There are specific functionalities, such as the revision control. Every change of content is recorded and can be traced. The access to single wikis can be limited to specific groups and needs to be manually activated for further users. There is no extra database for files necessary. Files, including images etc. can be attached directly to the related page. RSS feeds and e-mail notifications are possible as well. A benefit of Twiki is the big amount of plug ins, that are available to display files from external sources.
To edit content, it is either possible to use a regular HTML editor or choose the WYSIWYG (What you see, is what you get) editor, that enables people with no extended HTML knowledge to attach and edit information. However, from the author’s experience, the WYSIWYG usually does not work properly and causes a high level of frustration.

Twiki also has some more disadvantages. When the user only has a bit or no knowledge of HTML, the good organization of a page to share information with others is quite difficult. It is very time consuming for this person, because he has to find a different way to present his information. Most of the times, the content is also not displayed as desired, because some users do not use the opportunity to design the page entirely. If one has not enough time to organise everything on the page, it is just a page with listed items. Also commonly noticed is the reliability of files.

Is the available file really the latest version? This question is present all the time and causes the user of a wiki to contact the provider of the file directly to ask for the latest version. The author has noticed, that users of Twiki find it hard to create on page links, which forces the reader of the content to scroll down for a while.

Concluding it can be said, that Twiki is a good tool to share files, because it is easy to upload and name them and they are displayed in a nice overview table. But to share textual information and separate different content it is not very clear and easy to organize. More and more separate pages are created, which leads to a confusion with the navigation.
Microsoft Sharepoint

As an important provider of office related software, Microsoft has created a web site, that supports team collaboration and offers virtual space to exchange work related information and material. However sharepoint is not a free online software.

It has to be purchased before a team is able to use it. Once a team site has been created, there are a couple of main features that can be used. The most obvious part of the site is the announcement component, which is located in the center of the main site. Each team member can post important information immediately. On the right side of the site it is also possible to add hyperlinks to related web pages or internal sites. As in most common workspace web sites, the user of sharepoint can create their own personal web page, were she or he can store and collect posted content or uploaded files.

On the team home page is a document library. Any type of file can be uploaded to this library. It provides the possibility for team members to work together on one project and edit files as desired. A very helpful feature is the discussion board. The discussion board is like a forum, where users can post news, thoughts, ideas and also work together on a brainstorming session for instance. It is supposed to help the team to perform together and use its creativity. A more casual way of doing this is to create a sub site. This is also possible and kind of separates the really work related topics from things, that might not be of interest for the recent project.
Sub-sites are designed as blogs or wikis, where users can exchange random ideas and insights. Overall, Microsoft SharePoint leaves the impression of being a very valuable and helpful tool, but it seems to overwhelm users with its complexity. An alternative software is Q3 Share, which has mainly been created for the usage with the Macintosh operating system.
**PB Works**

PB Works is a company that provides workspace solutions for different customer groups. Their customers vary from law firms to academic institutes, such as universities or schools. One solution has been created to serve the needs of a design-oriented team. The aim is to reduce redesign, save time spent on logistics, and most of all keep clients up to date. The team can collect requirements of a product and share it with their client through an e-mail notification or RSS feed. Clients also have the possibility to edit certain things, post comments, or approve the requirements.

Another feature that helps to keep track of work progress is a place in the workspace, where design assets can be uploaded and shared with team members and presented to a client for review. The main page of a workspace is used to organize and display...
several ongoing projects. Description, project manager, due date and status can be found. Within a project a table is used to show milestones, tasks and the person, who needs to fulfill this task, so everyone inside the team knows, at which state of the process the project is and what the others are working on right now. This is also a tool to keep the client in the loop and provide a richer picture of the status.

Once a web page for instance is finished or in a higher level of the process, complex design examples can also be shared through the PB workspace. Again, clients and team members can review the web page and leave comments. A lot of feedback can be collected and stored that way. The Latest version of webpages can be uploaded and the list of versions can be used to see changes and improvements until a version is fully approved.
**incom workspace**

Probably the least well known example of a digital social workspace is “incom”. This example was chosen, because it had been developed at the “University of Science in Potsdam”, where the author had studied and used the work space for some time. “incom” has been developed in 2004 to improve the communication inside university courses and also to provide a digital platform, where students and professors can contribute information, that they find valuable for the course.

It has been created based on the successful concept of blogs and wikis. Each participant has their own web page, where all contributions that have been made by the participant in several course workspaces, are collected. Consequently the student at the time of graduation has some kind of workbook, documenting her or his work.

The most important part of “incom” are the work spaces. Each semester the professor creates a workspace that belongs to a particular course. The description of the course’s topic and further information can be found in this workspace. Students can sign in to show that they want to participate in the course. Once signed in, everyone can share useful or not so useful information. The information is displayed in chronological order. The latest post is on top of the page.

Every information which students post inside this workspace will be sent via e-mail to all assigned members. Another feature in such a workspace is the possibility to upload and download files and course related material. One reason why “incom” is valuable and helpful is because most of the students at University of Science Potsdam do not live in a close surrounding to the university and commute everyday.
“incom” helps to stay informed about all activities at the university. So to conclude, a workspace within “incom” is a kind of virtual lecture hall, a collection of important information and material. Participants are mostly committed, because the existence of such a platform depends on their contributions.
Retrospective

Considering research and analysis the author has gained some good background knowledge to identify the major problems inside the scrum team. She has also extended her knowledge about ways to solve these problems. To seek a satisfying solution to improve communication and exchange of information, several workspaces and wikis have been analysed and reviewed. Also the best ways of adapting information and communication in the digital world have been identified and can be used in the following concept phase to develop an individual and good, but user centered, concept.
Concept Content

To design an application or software, the content is usually the most important part of such a software. Content that addresses a certain type of user focus group. As mentioned previously, with the research, an analysis of current states and working together with the future users, it is fairly easy to define this user group and collect related content.

Considering the size of a scrum team, the users could vary between five and nine team members. Within these team members, there can be six different types of user groups, which are briefly described in the “Basic Information” chapter. First of all the usability specialist, who provides user research material. The product owner, who ideally defines user stories upon the research and management requirements. The user experience designer, who creates interaction and software flow specifications.

Then there is the visual designer, who creates graphic assets upon these specifications and sometimes provides a design specification. Both of the previous specifications will be used by the developers to create a piece of software, that eventually will be tested by the quality assurance person. The aim is to provide a solution, that can be used by and extended for all groups of a team, but puts the main focus on usability specialist, user experience designer and visual design.

On the following pages the author gives an example of the potential users by using a common user experience method: personas. The upcoming personas combine the characteristics, that were found in the interviews with real scrum team members. It represents three types of users, that are supposed to use the software in their daily work, eventually.
Persona

Alexander, 29 years

Home Country: Germany

Profession: User Experience Designer

Interests: Volleyball, going to Vernissages, cycling

Alexander, who is originally from Germany, loves design. He started working as a visual designer after university graduation and changed into the field of user experience after a couple of years. He is now responsible for information architecture and interaction concepts of a software.

He pays a lot of attention to user research and tries to include it in his concepts. But sometimes he misses the creative, arty part of his work, that he used to have as a visual designer. As a balance he cycles a lot on his racing bike.
Jarek, 33 years

Home Country:
Poland

Profession:
Java Front End Developer

Interests:
Soccer, Parties

Jarek is a very shortspoken person. He studied computer science in Warsaw and after his late graduation, he moved to Germany, to work for a telecommunication company.

He has not practiced his english very much, so he has a lot of difficulties getting around in his every day life in Germany. A lot of people can not understand him and he gets frustrated a lot. That is a reason why he spends long hours in front of his laptop, even after work.
Jussi is an adventurous person. He likes to hang out in nature and spend time with his buddies. All the money he makes is spent on travels. His background is in cognitive science, which he studied in the United States.

Not only does he like to hang out with people in his free time, he also enjoys his job, where he is responsible for user research in terms of observation of people and organising and running usability tests. Sometimes he gets a little frustrated, because people in his company do not take his work as seriously as he would like. Because he is out of office a lot, doing field research, it is also hard for him to keep track of all the activities that are happening in the office.
Marianna was born in Edinburgh. After her bachelor’s degree in electronic engineering, she decided to take a break and travel around the world. With a good friend she also spent some time in Germany and really liked it. She decided to stay and search for a job that would pay for her living.

Soon after, she started as a software tester. In the beginning she struggled a little with the new tasks but she enjoys the work, because the people around her are very nice and support her a lot. In her freetime, she still likes to hang out with friends a lot.
Use cases

In order to find out, what kind of content is provided and needed by team members inside a workspace, it is helpful to use the personas to create concrete use cases. These use cases might not all be considered in the following concept process, but they always help to keep the focus on the most important issues and give a more detailed description of a later product requirement.

Afterwards the author has done some mindmapping to analyze the potential content of a workspace, that will be designed for usage inside a scrum team. Collecting and assembling certain material and information in “content clouds” helps to identify the main focus points, that can be used to as main navigation areas in a software context.
<table>
<thead>
<tr>
<th>Professions</th>
<th>Cases</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>usability specialist</strong></td>
<td>The usability specialist wants to know, what questions about usability come up</td>
<td>access to comments and questions</td>
</tr>
<tr>
<td><strong>ux designer</strong></td>
<td>The UX - Designer wants to know from usability tests, what needs to be considered and changed in the designs for the upcoming sprint.</td>
<td>results and live streaming of tests</td>
</tr>
<tr>
<td><strong>product owner</strong></td>
<td>The product owner wants to create his user stories based on the use cases, that were defined upon user research</td>
<td>access to use cases and background of research material</td>
</tr>
<tr>
<td><strong>visual designer</strong></td>
<td>The visual designer wants to know what functional and usability issues need to be considered, when designing a feature.</td>
<td>ux-specification and user research material</td>
</tr>
<tr>
<td><strong>developer</strong></td>
<td>The developer wants to know, what features need to be implemented.</td>
<td>ux-specification and assets</td>
</tr>
<tr>
<td><strong>quality assurance</strong></td>
<td>The software tester wants to know, if specific users have to be considered (accessability)</td>
<td>personas</td>
</tr>
<tr>
<td><strong>team</strong></td>
<td>Team members want to relate to a certain user type instead of taking random personally invented users.</td>
<td>personas</td>
</tr>
<tr>
<td></td>
<td>Team members want to share their personal or observed experience with the product.</td>
<td>“comments”</td>
</tr>
</tbody>
</table>
Mind map: structured content

<table>
<thead>
<tr>
<th>Professions</th>
<th>Provides</th>
<th>Receives</th>
</tr>
</thead>
<tbody>
<tr>
<td>usability specialist</td>
<td>-&gt; user research material</td>
<td>-&gt; questions/problems/ideas</td>
</tr>
<tr>
<td></td>
<td>- analysis of user behaviour</td>
<td>-&gt; requirements</td>
</tr>
<tr>
<td></td>
<td>- pictures</td>
<td>(-) target group</td>
</tr>
<tr>
<td></td>
<td>- clips</td>
<td>-&gt; test cases (questions and problems)</td>
</tr>
<tr>
<td></td>
<td>- presentations</td>
<td>-&gt; test requirements</td>
</tr>
<tr>
<td></td>
<td>-&gt; usability test results</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- pictures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- clips</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- presentations</td>
<td></td>
</tr>
<tr>
<td>Professions</td>
<td>Provides</td>
<td>Receives</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td><strong>ux designer</strong></td>
<td>-&gt; ux-spezifikation</td>
<td>-&gt; user research material</td>
</tr>
<tr>
<td></td>
<td>- presentation/document</td>
<td>-&gt; usability test results</td>
</tr>
<tr>
<td></td>
<td>- prototypes</td>
<td>-&gt; user stories/requirements</td>
</tr>
<tr>
<td><strong>product owner</strong></td>
<td>-&gt; user stories</td>
<td>-&gt; user research material</td>
</tr>
<tr>
<td></td>
<td>-&gt; external info</td>
<td>-&gt; usability test results</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; management requirements</td>
</tr>
<tr>
<td><strong>developer</strong></td>
<td>-&gt; design specification</td>
<td>-&gt; ux-spezifikation</td>
</tr>
<tr>
<td></td>
<td>-&gt; graphical assets</td>
<td>-&gt; usability test results</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; user research material</td>
</tr>
<tr>
<td><strong>visual designer</strong></td>
<td>-&gt; pieces of software</td>
<td>-&gt; user research material</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; ux-spezifikation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; graphical assets</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; software test results</td>
</tr>
<tr>
<td><strong>quality assurance</strong></td>
<td>-&gt; software test results</td>
<td>-&gt; pieces of software</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; ux-spezifikation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; user research material</td>
</tr>
<tr>
<td><strong>team</strong></td>
<td>-&gt; experiences</td>
<td>-&gt; better overview of team activities</td>
</tr>
<tr>
<td></td>
<td>-&gt; opinions</td>
<td>-&gt; experiences</td>
</tr>
<tr>
<td></td>
<td>-&gt; ideas</td>
<td>-&gt; opinions</td>
</tr>
<tr>
<td></td>
<td>-&gt; observations</td>
<td>-&gt; ideas</td>
</tr>
<tr>
<td></td>
<td>-&gt; news</td>
<td>-&gt; observations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; news</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; user stories</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; user research material</td>
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<td></td>
<td></td>
<td>-&gt; ux-spezifikation</td>
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<tr>
<td></td>
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<td>-&gt; usability test results</td>
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<td>-&gt; graphical assets</td>
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<tr>
<td></td>
<td></td>
<td>-&gt; design specifications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; pieces of software</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-&gt; software test results</td>
</tr>
</tbody>
</table>
person

personas

time

priority

user stories

personas

DEVELOPMENT

QUALITY ASSURANCE

USER RESEARCH

VISUAL DESIGN

USER EXPERIENCE

SPRINT THREE

SPRINT FOUR

SPRINT FIVE

SPRINT TWO

SPRINT SIX

20 MAY 09

14 AUGUST 08

WEEK

TODAY

YESTERDAY

EMAIL MUSIC SHORT

PRESENTATION

INDESIGN FILE

11:00 TODAY

TODAY

WEEK

20 MAY 09

14 AUGUST 08

YESTERDAY

TODAY

WEEK

11:00

MEDIUM

LOW

NO

HIGH
Workspace requirements

After structuring the content, that needs to be included in the workspace, a few requirements concerning this content need to be defined. This is important to provide a useful and interesting software. To all team members, a good overview of all recent team activities, especially user related activities, is the most important requirement. This overview need to be given on first glance on the main page of the workspace. All displayed info need to be easily perceivable and understandable. Provided material needs to be accessible and downloadable.
The whole content needs to be sorted in chronological order. The latest news and info should be visible right away and available to all team members. Keeping in mind, that the team consists of different nationalities a good understanding of the content is an essential factor. Each member of a team should participate and contribute to the workspace with its own observations. Everyone notices things in their everyday life that can be of big importance for the success of a project. The workspace needs to provide a special part, where team members can present their observations, ideas, opinions and experiences.

The most important content of the workspace is of course all the material, that is generated by the team members. Because this thesis is focusing on the user experience part, user research, user experience design, visual design and usability testing are the main fields, that need to be taken into account. Each field develops project related material, that is important to all other fields, such as software development and testing as well as to the product owner. This means, that everything needs to be easily accessible by all team members. It needs to be understandable for everyone and possibly downloadable.

Each team member is responsible for assuring, that the material is up to date. Latest files, info etc need to be in focus and it should be visible, wether a project is finished or still in progress. It should also be possible for each team member to post comments concerning any material, even if her or his own work is not related to this material. Especially for the visual designer, but not only, it is important to share files, that are ready for use and can be reviewed by every team member. Material in general should be organized by priority. Current sprint user stories for example have the highest priority. However results from usability tests need to be prioritized as well and included in the sprint process. There needs to be a linkage between related material and info, so that a collection from that material evolves.
Visually appealing

Not to forget, the actual product, that is being created by the developers, needs to be accessible as well. Also software testing related info, that might help to fix bugs in the product code.

Considering the research from Chapter I, section 5.2, about information adaptation, the entire content should be visually appealing and easy to perceive. To support this goal, as many images as possible should be integrated. In the form of photos or movie clips. By creating a workspace that lives on user created content, a longer memory of the content should be given.

Additional research results

According to surveys, that were send out to several potential users of the future workspace there are a few other interesting issues, that also will be considered in the later concept. In the addressed surveys the author asked about what makes a receiver of an e-mail open an attached file. What are the main factors that catch attention and eventually let one open the attachment. First of all, it is important to know the sender of an e-mail. If the sender is a well known and trustworthy person, people most commonly open the attached file. Adding a good and informative, at best title to the file will increases the potential of being opened by the receiver. Sometimes attached files are indicated by a preview inside the email. Users most commonly liked this feature as a help to decide, whether to open the attachment.
A workspace usually, as the word implies, means a space, where work can be done. In this particular case it is work done by several people. So multiple workspaces need to be joined together to one big workspace. The ideal picture would be a big table, where all team members sit together and work simultaneously and can speak to each other whenever they want. Everyone speaks the same language, they help each other out and they get along well.

In reality certain circumstances unfortunately do not allow such a perfect work environment. As mentioned in an earlier section, team members sit in separate rooms, even separate buildings. They are multinational, meaning they speak English as the common language. But because most are not natives, understanding each other sometimes becomes quite difficult. To create the ideal “workspace”, it is helpful to identify something, that everyone inside the team uses regularly on a daily base to communicate with others and share info and material. Something that each
member can access and use effectively. Maybe even something, that people work
on. The two most obvious things, that are used to communicate are a cellphone and
computer.

Since this thesis relates to a telecommunication company it would be self evident,
to focus on a solution, that can be used via cellphone. But research has proved,
and again this is not something very surprising, that all work, that is done by team
members is created by using a computer. Most of the times it is a laptop, so one can
still be flexible and move a workspace to a different physical environment. However
the digital workspace does not change.

It might happen, on one day the user
experience designer sits together with the
usability specialist to talk about research
and on the other day he has a five hour
meeting with the product owner about new
requirements. His own personal workspace
on his laptop, where he is working on a new
ux- specification, does not change. Unless he
himself makes changes to it. Taking all of this
into consideration, there is almost no doubt,
that a solution for a digital workspace should
be created for usage on computers. It could
also be possible to develop a concept of a light
version for cellphone usage later on.

It is not only important which hardware the design should focus on, but also, what
digital environment is preferred by users. In past interviews, people inside scrum
teams have mentioned, that they do not like to be forced to install something on
their computers. They like to have the possibility to use something, but they do not
want to have it on their machines. And yet again there is one obvious way to avoid
this: the browser!
Sometimes answers seem just too simple and not very innovative. However, considering the user, these answers might still be the best and most successful ones. It also does not mean that innovation is not possible inside a well-known territory.

Additionally to the “browser-workspace”, there should be a desktop application that can be used independently and provides the last status of the workspace, when being offline. To improve and draw attention to the workspace, it always needs to be present somehow. Since it will be a browser-based application, it can be switched on and off as desired. How can the loss of interest by users be avoided?

In one of the main buildings of the company, this thesis relates to, the author has noticed a screen on a wall, which displays stock exchange news. Each time, someone walks by this screen he or she throws a glance at it. Even though the info, that this screen provides is most of the time not of the persons interest, one has to look at it. Because it is an image on a screen that catches the attention. Using this observation, a good way of continuous involvement of the user is to set up a simple screen at a location, where team members walk by most frequently.

The workspace should be displayed at all times. This draws the attention to it and keeps the team members informed. As well as people from other teams. In this case, it would be even better, to have a touch screen, where other people can contribute as well as the actual team members.
Content formats and metadata

Once the required content is gathered and structured, a smart way needs to be found to access and navigate through this content. Using the part of user centered design as the important one for this thesis, all types of content formats, that will be shared in the workspace should be analyzed.

To recover and gather everything, that has been collected during a user research study, either user observations or usability tests, usually photos and videos are used to support the researchers memory and notes. These are very helpful to present examples of specific users and problematic use cases. After a study has been done, the researcher writes a report or creates a presentation to share the results internally. These reports are mostly created in presentation software such as Power Point, Keynote, etc., but also in word processing software or layout software, such as Word or InDesign. Most of these formats are exported into PDF as the final format. Sometimes also Excel sheets with quantitative results are presented.
The user experience designer and visual designer as well, mostly share their specifications in PDF formats, which are previously created in layout tools. The visual designer also provides the graphical assets in several desired formats, such as SVG, PNG, just to name a few.

In terms of the work place, sharing some files in their original format should be considered, this way they can be edited and changed by multiple users. This also allows for the latest state of a file to be provided. Users should feel, that they can trust the actuality of the content.

Additionally to the format, files always need a name or other kind of attached information, that make it possible to relate the file to a specific topic. A good way of doing this, is to add metadata to the file. For instance the date and name of the creator is already helpful to find this file in a database with several other files. Because the files, the author refers to, are created in the scrum process, there are various types of metadata that are somehow predefined and can easily be attached. The ones, which are most necessary, are: which sprint the material belongs to, date of creation, from which group and concretely person does the material come from, priority, related user story and personal tags. When this information is attached, it is easier to locate the file.
Concept: Functions

In order to create a well functioning workspace, there are three most important conditions, that should be kept in mind. First of all, the most important content for the users needs to be identified and structured. The second part is the rough layout and interaction concept of the application. And the third aspect is the visual design that supports the functions and usability. In this part of the thesis, the author presents a sitemap of the future workspace application.
Furthermore three first drafts of concept versions concerning the functionality will be presented. Later on, one version will be used for further development and enhanced. Potentially in combination with an idea from another concept version. In order to align the development process of the future application, the earlier created use cases will be kept in mind and later on tested with potential users. Because the focus remains on the part of user-centered design, only certain ones of the listed use cases will be considered.
Concept I: Filtering

This first idea for a commonly shared workspace is based on a filtering method. This method only works, when files are equipped with meta data. Name of author, date of creation and priority are only some of the necessary information, that need to be attached to the file. The more meta data a file gets, the easier it is to find. In this particular case, the resulting files are shown as images, organized in a horizontal order to be able to scroll through them. Every user is able to download, delete or simply comment on the file. Certainly uploading a file is possible as well.
When searching for a file particularly made by someone in the user research department, one can simply click on “user research” in the area field and all other fields with meta data changes to what is available from user research. If the user knows a related tag for instance, the results can be limited again.

In order to see some more detailed information and related material, the user only has to click on the image and a detail view will be visible with all important information.

Again, actions such as downloading, deleting and commenting are possible.
Concept II: Matrix

The second draft of a workspace is a more visually focused approach. Images of the content are arranged in a matrix without any further text. On top of the page is a timeline separated into sprints and days included in the selected sprint. The umbrella terms for the categories in which the content is classified are located on the left side. Clicking on a category opens up another column which includes all sub classifications. The content in the center is dependent on these sub classifications and the visible time columns.

A number on an images indicates, that several files have been contributed on one day and sorted under the same sub classification. Clicking on the displayed image, all images with files from the same day and the same classification open up underneath.
When the mouse is over an image, the name of the file pops up. A currently used file is marked, so users know it is in progress. When clicking on an image, the detail view opens up and provides basically the same information as in the first concept.
**Concept III: Threads**

The author’s third approach is a more abstract visualization of a content web. Essentially the application is based on a graph with three dimensions of content: sprints, areas and priority. Sprints are also subdivided into individual days and areas into individual people. The priorities are visualized with three scopes inside the graph. Images of content are located in these scopes and connected with single lines to the two axis. This eventually creates a web.
The user has the possibility of getting informations from different kinds of perspectives. When one wants to know, what has been created by a certain area, a click on this area shows all files created by all people within this area.

If one only browses through the files and wants to know, who created a specific file and when has it been created, one only needs to click on the image and the corresponding infos will be shown on the two axis.
Final Concept: Threads

After the previous three concepts have been reviewed by the author and other inspired people, the third draft was considered as most effective, but also appealing to use.

Using the main part of the interface to create a visual web of information and material is a good way to influence the users perception. The primary goals that the software needs to achieve are, providing a good overview as quickly as possible, and giving the ability to set different appearances according to personal preference. Setting metadata to search and therefore having easy access to material and information is equally important. The third concept has the capability to fulfill these requirements. To know whether the concept serves the previous aims, it is helpful to get some feedback from the future users.

For this reason the author has extended the rough draft of a concept to a more detailed specification of the later application. A simple wire frame flash prototype has been created to be used in small user tests. In these tests, it will be checked whether important use cases are served by the concept.
Description of first test version:

First appearance

The first enhanced wire frame prototype includes a center part of the interface in which all files, that have been uploaded, are displayed. In default view there is no specific order. Images serve as visualization of the files. Depending on the assigned priority of a file, the image can be one of three sizes, describing low, medium and high priority.

Extensions

On the left side of the main interface is a scale, which lists the different areas of design inside a scrum team and within each area are other marks for each team member. On top of the main part is a similar scale, representing sprints and the included days. Also on top are four options to extend the visible information or to enlarge the possibilities of interaction. The extension of visible information could be to display all connections between images and scales or to display the assigned tags instead of images.
In order to use the option to enlarge the possibilities of interaction, meaning to be able to set several metadata on the scales, the user is able to decide, what he wants to see on the right side of the main interface. He can choose between scales that display user stories or personas, or he can choose to see all comments that have been made to a selected image/file.

In terms of interactions, the workspace works as followed: the user can either start searching for a file by browsing through the images, or when hovering over an image, the title and all connections related to the metadata on the surrounding scales etc. are visually displayed. When clicking on the image, a detail view pops up, with all metadata and comments. A quick download of the file is possible in the hover status and also in the detail view. Commenting is only possible in the detail view. In order to upload a file, there is a simple upload button, which leads to the commonly known
Interactions

The file upload procedure. Coming back to the file searching. To search for something on a specific date or created by a specific person, the user clicks on the named part of the scale and again the results will be visually displayed. In order to set more than one category, the user checks the “several metadata” check box, then sliders on each side of the main interface appear, which can be set to the desired points, to decrease the amount of images in the center.

From a more global perspective it is possible to have a number of team workspaces, which work in parallel, but can be visited also by members of other teams.
sprint 8
user research
user experience
visual design

upload file

sprint 8 today

9 MAY 09 12:30

pick scale
close

user stories
zooming
panning
plug in
tilting
2D/3D
mini map
scale

Comments and Adds:
13:00 22.05.09
“this is somehow related”
12:40 22.05.09
“find it usefull”

download
close

title of file
time sprint person priority tag area

comment
delete
download
Basic prototype usability test

Developing with users
One of the author’s most important aims is to work together with the potential users as closely as possible. Therefore, as mentioned in the previous chapter, the final concept has been used to create a basic flash prototype with limited functions. This prototype has been used to find out about the major usability problems within the concept.

Participants
In order to conduct such a usability test, the author recruited six participants, who match the target group of the product. These participants consisted out of two developers, two product owners, one visual designer and one user experience designer. The group was split in half by gender.

Test flow
Due to the limited functions of the prototype, a concrete survey has been created with different tasks, that needed to be accomplished. If tasks could not be finished or only with the help of the interviewer, it became obvious, that some changes on the specific functions needed to be done. The participants were also asked to express their thoughts and impressions. This also helped the author to find the major issues related to the product.
On the following pages the resulting issues are listed. Furthermore, solutions and changes to the found issues are provided.

<table>
<thead>
<tr>
<th>Part</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeline</td>
<td>- direction from right to left not logical</td>
</tr>
<tr>
<td></td>
<td>- not clear, what time is displayed</td>
</tr>
<tr>
<td></td>
<td>&gt; upload, saved or finish date?</td>
</tr>
<tr>
<td>Tags</td>
<td>- separate display of tags not understood,</td>
</tr>
<tr>
<td></td>
<td>- to hard to see connection between images and tags</td>
</tr>
<tr>
<td></td>
<td>&gt; had to switch back and forth</td>
</tr>
<tr>
<td></td>
<td>- no connections between the files with same tag</td>
</tr>
<tr>
<td></td>
<td>- no way to search specific tags</td>
</tr>
<tr>
<td>Wording</td>
<td>- “meta data” not understood</td>
</tr>
<tr>
<td></td>
<td>- “3rd content” not understood</td>
</tr>
<tr>
<td>Default view</td>
<td>- how to get back to start interface faster</td>
</tr>
<tr>
<td></td>
<td>&gt; had to do too many clicks</td>
</tr>
<tr>
<td>Display of images</td>
<td>- too cluttered, when more images are displayed</td>
</tr>
<tr>
<td>Icons and buttons</td>
<td>- clickable buttons not visible enough</td>
</tr>
<tr>
<td></td>
<td>- “delete” button in detail view too close to other buttons</td>
</tr>
<tr>
<td></td>
<td>- icon for a completed file missing</td>
</tr>
<tr>
<td></td>
<td>- editing option missing</td>
</tr>
<tr>
<td>Interactions</td>
<td>- not enough to be able to select one image</td>
</tr>
</tbody>
</table>
Revised concept

With the results of the usability study, necessary changes to the final concept can be made. The author has also come up with a few additional ideas in terms of the environmental and physical usage of the workspace. As it was mentioned in an earlier chapter, the concept also includes such a thing as a “team screen”, where the application is displayed at all times. The physical presence of the workspace and the room around the screen can be used for important interactions with the application. The author will get back to this later, but first of all the software related revisions will be addressed.

<table>
<thead>
<tr>
<th>Part</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeline</td>
<td>- change direction of timeline</td>
</tr>
<tr>
<td></td>
<td>- definition of time: last time edited and saved</td>
</tr>
<tr>
<td>Tags</td>
<td>- tags only displayed in the hover panel</td>
</tr>
<tr>
<td></td>
<td>- when hovering the tag, all files with same tag will be visible</td>
</tr>
<tr>
<td></td>
<td>- when clicking on tag, hide not related files</td>
</tr>
<tr>
<td></td>
<td>- searchbox for tags</td>
</tr>
<tr>
<td>Wording</td>
<td>- “set filter” instead of “meta data”</td>
</tr>
<tr>
<td></td>
<td>- “category” instead of “3rd content”</td>
</tr>
<tr>
<td>Default view</td>
<td>- make the title clickable to return to “home”</td>
</tr>
<tr>
<td>Display of images</td>
<td>- set automatic filters</td>
</tr>
<tr>
<td></td>
<td>&gt;&gt; hide unimportant images</td>
</tr>
<tr>
<td>Icons and buttons</td>
<td>- improve visual design</td>
</tr>
<tr>
<td></td>
<td>- repositon the “delete” button</td>
</tr>
<tr>
<td></td>
<td>- add an icon that marks a file as completed</td>
</tr>
<tr>
<td></td>
<td>- add an option to edit material</td>
</tr>
<tr>
<td>Interactions</td>
<td>- be able to select multiple images with a control click function</td>
</tr>
<tr>
<td></td>
<td>- be able to move images around</td>
</tr>
</tbody>
</table>
New settings

New timeline

Files connected through tags

Clickable title and repositioned delete button
Physical extra feature

The digital workspace is not only meant to be used individually, but also within a group of team members, for instance at the daily stand up meeting. For this reason a touch screen has been described (see page 77), which is located at a noticeable position. To extend the use of this screen, the author developed the idea of connecting the digital workspace with team members. This can be arranged by giving each person a RFID tag, that can be detected, once this person enters a special area in front of the screen. Once she or he is detected, the application will only display the material, that had been provided by this particular person. The same works with several people. Simply their personal content will be visible on the screen. In case the team wants to see material that had been uploaded or created by team members who are absent, there will be a “display all content” button to see every available material and information.
Concept Design

The name of the workspace has been decided upon “THREADS” as the connections between material and content are like a web of threads.

On this page a short preview of the visual design of “THREADS” is presented to give the reader of this thesis a feeling for the graphical user interface of the final product.

**colors**

![Color Swatches]

**font**

Nokia Large Light 14P  
Nokia Large Regular 14P, 20P  
**Nokia Large Bold 20P, 40P**

**icon and button style**

![Icon Examples]
Conclusion

_Sometimes new ideas grow in the process._

The original title of this bachelor thesis was “Visual guide on how to integrate usability methods into the scrum process”. As the reader of this piece of research and concept work can see, in the end the result might not solve the problem directly, but help to solve it in the long term.

“THREADS” is an efficient and feasible virtual tool which in theory is easily accessible from everywhere, where users can surf the internet. Nowadays with laptops, netbooks and mobile phones this is possible wherever one goes. This leaves a lot of potential for such a workspace related software as proposed in this thesis.

The problem of finding something specific in a mass of data, even if it is located on ones own storage, is familiar to every person, that uses a computer system and especially if it is used together with other people. This thesis has to be seen as an approach to make it easier to find data and to have an overview of things, that are not so obvious on first sight. The author has decided to leave as much room to the user as possible to set own preference of search and consider different search behavior. People are very different, not only within different cultures or different age groups also within friends or family. This is why the future of the digital world needs to focus more on individuals and has to be more adaptable and dynamic.

All aspects considered it can be concluded that this thesis has dynamically improved during the process of researching and developing a concept. This concept can be taken into further development and with the help of users, a successful final product can be developed that will help to strengthen the position of user experience work inside a scrum team.
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www.twiki.com
Affidavit

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Furthermore, I confirm that no sources have been used in the preparation of this thesis other than those indicated in the thesis itself.

Janine Benker
Berlin