Introducing agile principles and management to a library organization

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Abstract

Libraries are pressured to adapt to changing conditions due to user demands, behavior, emerging technologies and a need for cost-efficient solutions. Software companies have turned to agile development to stay competitive and to deliver working solutions in a short timeframe. Agile processes are built upon co-operation, iterative workflows and delivering working solutions with a high business value. Agile development and management in an agile organization constitutes a controlled framework of principles with a promise to ensure that the organization focuses on the right things and is able to adapt to new needs.

The Library at Chalmers University of Technology in Sweden introduced agile software development in 2011 as a part of the work with the institutional repository. Following the success of introducing Scrum to system developers the formation of cross-disciplinary teams for other projects involved librarians. One of the projects for a cross-disciplinary team was to develop a brand new website. Drawing upon the experience of Scrum and with a focus on User Experience design (UX) the team was able to define an agile methodology involving different competences at the library. As other projects formed and adopted the principles of Scrum and agile the methodology spread throughout the library organization as it was re-organized.

Managing an agile oriented organization can be challenging. Senior management has been forced to work with allocating resources, input to prioritization, sprint planning and judging business value thus forcing a transparency to appear in the organization and exposing its operations.

Chalmers Library is still exploring the possibilities and challenges of working with agile development and management. It is an iterative and evolving process, but the benefits far outweigh the drawbacks as the organization can learn and respond to change, re-prioritize how resources are allocated, avoid knowledge silos, build strong teams and identify uncertainties early.

As of January 1st 2014 the library organization changed and introduced agile principles throughout all operations.

Keywords: Libraries, Change, Scrum, Agile, UX, Management

Introduction

Change. The world is changing. This is not new. The human race has evolved and our societies continue to evolve and change over time. Adapting to new circumstances, technologies and cultures in a rapid pace. The methods to deal with that change in the 20th century is increasingly failing as people in our organizations are failing to connect their practice with the needs and vision of libraries of the future. The ways in which we operate, the structure of our work is holding back the development of libraries and the necessary change. Stephen Denning describes the need for change and how to make change happen in our emerging world.

> "It's about sparking change that engages people hearts and minds. It's about change that draws on everyone's talents and creativity, not just the schemes of a few experts at the top.
>
> Instead of articulating a top-down vision to be rolled out from above, crushing "obstacles" in its path, it's about inviting people to dance with complexity. Instead of mining "human resources", it's about minding the people. Instead of tending the vertical hierarchy, it's about stimulating the horizontal network. Instead of constructing firewalls to insulate the firm from its context, it's about engaging with the environment." (Appelo, 2003, p. VII)

By introducing agile principles throughout our library organization we are moving towards an organizational culture that can deal with change, engage and develop the services that our users love or didn't know they needed but love when they find.

A new organization

In the spring of 2013 an overhaul of the library organization was announced. During the following year interviews with staff, other libraries and literature reviews commenced leading up to a new organizational structure with three departments and three cross functional teams focused on library operations and processes.
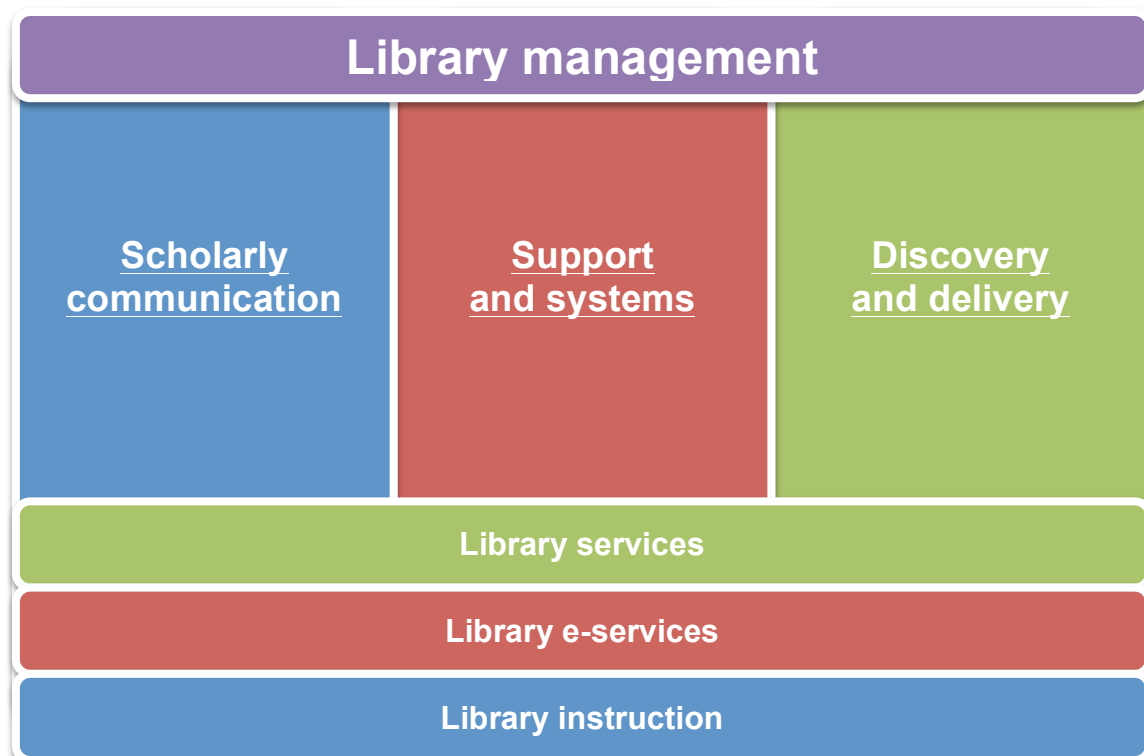

Figure 1: Chalmers Library Organization 2014

The department for Scholarly Communication focuses on library services for storing, analyzing, visualizing and communicating research information. It is also the host for a cross functional team working with library instruction and the information literacy program at Chalmers.

The second department, Discovery and Delivery, focuses on acquisitions, meta-data description, inter library loan and library systems. The department is the host for a cross-functional team that works with the physical library space and the user services associated with it. The team is called Library services.

The third and last department is the department for Support and Systems. This is the department for internal library support and includes administration and finance but also project management, marketing and software development. This department is responsible for a cross-functional team working with the library web services, keeping a social media presence and organizing the virtual support.

As the new organization was presented for the staff a critical question was posed from senior management. *What is the greatest risk with this organizational change?* The answer from library staff showed great maturity as they answered:

The greatest risk with a change to our organization is that we will continue to work as previously, that the change means no change in our operations and that the change won't matter.

This turned management focus from the organizational scheme to a discussion on how we conducted work and current workflows. The new organizational scheme and structure was process-oriented but it did not really influence the way in which we worked.

Drawing upon a 3 year experience of agile software development in the library where librarians had worked together with systems developers it was decided that we would try and implement agile principles to the entire organization.

Agile
Agile means the ability to move with quick easy grace or to have a quick resourceful and adaptable character (Agile. Britannica). It has become a synonym for coping with a brisk pace of change. Used in software development and now other branches agile principles are being used to create a better incent for engagement and efficient projects. To be agile is to be able to move, adapt and constantly improve and thus creating a better value for the users with your services according to their needs.

The Manifesto for Agile software development was written at a time when software developers where frustrated with the pitfalls of a waterfall methodology. A simple manifesto with a new set of guidelines for development focusing on working software, people and the need for change:

> *"We are uncovering better ways of developing
> software by doing it and helping others do it.
> Through this work we have come to value:*
>
> *Individuals and interactions over processes and tools
> Working software over comprehensive documentation
> Customer collaboration over contract negotiation
> Responding to change over following a plan*
>
> *That is, while there is value in the items on
> the right, we value the items on the left more."*

(Beck et al., Manifesto for Agile Software Development)

The principles behind the manifesto are customer satisfaction, to welcome changes (even late in a process), to do frequent updates, to collaborate and to reduce complexity by adding more perspectives. There is an emphasis on time for reflection on previous work in order to improve. (Beck et al., Principles behind the Agile manifesto) From these principles a number of different methodologies has evolved focusing on the different aspects of the agile principles

Speculation, development and change

Spec. Specification. Speculation. Libraries and librarians seem to be obsessing with speculation and specifications. As a profession we are speculating in the competencies we need to develop in order to stay relevant and meaningful to our users. We speculate in user needs, in library services and in what we need to change. We specify and describe complex workflows, functions or processes and ask for enhancements to our domain specific support systems, standards and protocols.

Change seems to be what is driving the obsession of speculation about the future, the next trends and it is understandable. In the last ten to fifteen years everything has been changing. The pace of change, in software development, the global knowledge production and evolving user needs is staggering. However library organizations are not built to respond to change and our biggest assets, the competencies of our work force, our friends and colleagues are slow to adapt to pace of change that we see in technology and society.

We are used to thinking about problems and solutions from a speculative perspective. We investigate if something needs to change, we describe what needs to change, the problem, the cause and the solution. Then we start working on implementing the solution after all parties have agreed on the problem and solution. Death by committee is a common way of describing the slow pace of changing anything within our organizations. We continue to discuss and speculate instead of acting-learning-reflecting and acting again. This traditional way of developing or solving problems is very close to what is known as the waterfall development process.

The waterfall development process begins with a requirement analysis followed by a series of steps where you do all of your research before you start implementing the solution. In waterfall software development the steps are usually requirement analysis, design, code, integration, test and then deploy. In libraries we usually do the same. We do a requirement analysis, talk about the different solutions available, agree internally on how to proceed, implement a change, test it and then deploy the change, a process that can take a very long time.

Agile principles of development are a counter reaction to the slow waterfall methodology. Instead of speculating and specifying all eventualities the principle is to reduce complexity by focusing on delivering value within a short time span and then iterate. This is refered to as the Build-Measure-Learn feedback loop used in Lean UX.

Agile in libraries

In 1998 Lorraine Haricombe and T.j Lusher edited *Creating the Agile Library: A management guide for librarians*. The book was an answer to meet the rapid changes in the library environment due to the impact of technology in society and higher education. A environment that had been stable for decades. By embracing creativity, innovation and entrepreneurship, and creating an environment that encourages and supports risk taking the agile library organization can permit the flexibility needed to take risks and make changes that will address the users' actual needs. The book then describes the concept of agility, how to prepare the organization for change, using and coping with emerging technologies. The authors of the book where forward sighted and identified the rising disruption of electronic content to library services and the emerging virtual environment. The book describes the agile library from a organizational and management perspective and was well ahead of its time, urging libraries to change in order to remain relevant.

Chapter 1 *The Agile Organization: A "Better Moustrap" for Libraries* introduces the concept of agile enterprise and how to survive rapid change (from a paradigm theoretical standpoint). Chapter 6 *Users: Their Impact on Planning the Agile Library* focuses on users' need and the changing demographics of the university. The concepts of a new learning environment, changes user needs and expectations, these ideas are well in line with the current and very modern UX movement. If not adapting to user needs the consequences are dire:

> *"Failure to do so may render the library irrelevant."*
>
> (Haricombe, p.91)

The book was well received and reviewers acknowledged the need of a *"Agility of mind, innovation and public entrepreneurship"* to cope with continual change, but by building on the core and old principles of librarianship (Hendry).

As an introduction to agile thinking, organization and management in libraries the books is still relevant.

Roy Tennant followed up on the books theme in 2001 in a Library Journal column titled *Building Agile Organizations*. Hiring flexible staff to meet the future challenges is essential but also to maintain organizational agility. Key factors for doing so are communication within the organization (from below and above), managers are to encourage individual agility over standing committees and not hiring full-time permanent staff members. These ideas are far from todays agile principles and values where the cross functional team are favoured over individuals and where a team learns from experience and grow together. There is less room for a single expert in the modern agile organization then in the old specialist/functional expert centered organization. Also allowing team members to grow and learn from their mistakes is emphasized more today.

As the Library 2.0 movement talked about the need to update library services a manifesto for librarians was defined by Laura Cohen. Similar to the agile manifesto it focuses on librarianship and the need to adapt to change and interact with users. Today the term Library 2.0 isn't being used as frequently. But the focus on user interaction and need for valuable digital library services is. The manifest spread out to librarians all over the world and one of the key components is about embracing change.

> *"I will recognize that the universe of information culture is **changing fast** and that libraries need to respond positively to these changes to provide resources and services that users need and want"*
>
> (Cohen, 2006)

The manifesto still has a valid point as librarians working in an organizational structure need to redefine the same structure that might hold them back.

Agile Software development at Chalmers Library

In 2010 Chalmers Library started using an agile software development methodology called Scrum. The name comes from rugby. A scrum is when the players huddle together. The Scrum methodology was developed during the 1990's by Jeff Sutherland and Ken Schwaber (Sutherland, J. & Schwaber, K.). It is an iterative and incremental methodology focusing on delivering working software with a high value for the user.
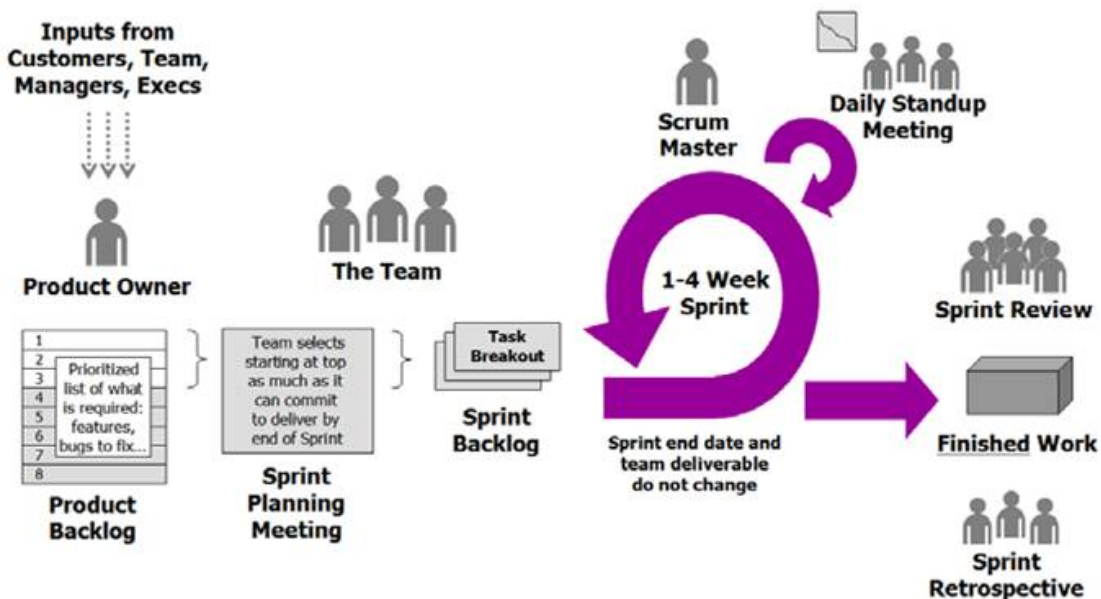
Figure 2: Agile methodology workflow (Sadhan)

The Scrum framework contains several key components and roles. Every project has a Product owner. The role of the product owner is to maintain a prioritized backlog with requests for enhancements. These are usually in the form of a user story that describes what and why the user would want an enhancement or function. Anyone in the team can add stories to the backlog and they are refined as the backlog is worked on by the team. User stories can be loosely formed ideas that during refinement becomes detailed user stories.

Mike Cohn describes a user story like this:

> "User stories are short, simple description of a feature told from the perspective of
> the person who desires the new capability, usually a user or customer of the
> system. They typically follow a simple template:
> *As a <type of user>, I want <some goal> so that <some reason>." (Cohn)*

A library specific user story would be:

As a librarian I would like to be able to add MARC records to the catalog so that the item will become visible in the OPAC.

At the sprint planning meeting the project team discusses the back-log and user stories. The group decides on how many of these stories they will complete in the upcoming sprint and then create tasks for each of the story. The tasks are usually put on a board for everyone in the team to see. But the tasks and the text of the user story is not what's of interest. It is the discussion within the team that is of interest and the stories are merely tools facilitating that discussion.

> *"User stories are often written on index cards or sticky notes, stored in a shoe box,*
> *and arranged on walls or tables to facilitate planning and discussion. As such, they*
> *strongly shift the focus from writing about features to discussing them. In fact,*
> *these discussions are more important than whatever text is written." (Cohn)*

As work progress during a sprint (usually 2-4 weeks), the tasks are completed by the team. Everyday there is a meeting with team members as they talk about what they did the previous day, what they will be focusing on for the current day and if there are any problems or obstacles. The facilitator of the daily scrum meeting is called a scrum master. The scrum master is a designated person who helps the team to follow the intentions of the methodology and facilitates and communicates with those who have an interest (stakeholders) in the teams work and progress.

At the end of a sprint there is sprint review where the team demonstrates their work for stakeholders and get feedback on their work. As a part of the review there is a feedback session with just the team, focusing on the relations, problems and possibilities during the sprint.

The process then restarts and the team selects new user stories to work on for the upcoming sprint.

Scrum is a controlled methodology with focusing on rapid delivery of working software. By reducing complexity and focusing the work on specific aspects the team can respond fast to changes in requirements. It also forces the team to work together and to talk about what they are doing (or not doing). Any problems are identified early and can't be hidden away.

Cross functional teams
As the software development team at Chalmers Library worked with different library oriented projects the team became more cross functional. Instead of having librarians as stakeholders in a project we started to include them in the development team. This led to a mutual development and understanding of the library business for developers and librarians who started to share knowledge and train each other.

Gary Chin describes the cross functional team and member's roles as

> "… defined by expertise and a desire for team success, while a classic team is defined by title and function. In a team defined by title and function these are barriers and boundaries between team members. In an agile team roles are changed, swapped and some even elimininated as the team work together to overcome and solve the problems they face." (Chin, G)

Management and agile

After running several projects using cross functional teams of librarians and developers senior management at Chalmers Library started discussing how to implement agile principles in the entire organization. Traditional business management can be a severe threat to agile methodology. It is important for managers to trust the agile team and not to micro-manage their work. It is not the role of manager to tell the team how to solve a problem. That responsibility lies with the team. The manager is supposed to help the team, remove obstacles allowing them to focus on tasks.

The team is supposed to be self-organizing and the team is supposed to take responsibility. There is no project leader in a traditional sense, instead the group communicate and agree upon actions in order to solve the tasks in a sprint.

Managers are still important as stakeholders and by communicating with the product owner they can help prioritize the backlog and adding user stories. By introducing agile principles senior management has to change and move towards what Peter Saddington describes as the *Servant leadership*. Where the most important job of a team leader or a manager is to remove obstacles or to resolve dependencies between team members and teams, remind the team of mission/value of the project and to protect the team and filter nonessential information and meetings.

Understanding your context – user experience and design

As Chalmers Library services became more electronic a divide between the physical library and the electronic library appeared. The researcher no longer had to visit the library in order to access information. They and our students can access our information services at any time from anywhere. The people who librarians meet in the physical library are a minority of the people who use our services. Designing library services based upon the interactions with that minority will not develop the services that the majority of our users need. Trusting a librarian's appraisal of user needs based upon the experience of only dealing with a minority of our users is dangerous and a incorrect representation of the user community and needs. Electronic resources and services have created a gap between the majority of our users and the people who work in the library. In order to develop the library we need to update our impressions of what our users are doing and what they need and not need.

By turning to the growing discipline of user centered design, interaction design and user experience (UX) there are tools that we can use to close the knowledge gap between the library and its users.

First of all libraries are not in a position where we can influence or change user group behavior. We can reach, enlighten and change individuals by reference or library instruction. But it is extremely difficult to influence or change a group behavior. Libraries can continue to bang their heads to a wall as we try to enlighten our users about the benefits of our services or we can learn more about group behavior and design services that fit that behavior. By adapting services to user behavior we might get users to see the value and use our services.

Our value lies in making the lives of our users easier. We can do that without telling them that we are doing it with excessive branding. There is reward enough in that and by focusing on doing the right things and doing them well we will be acknowledged.
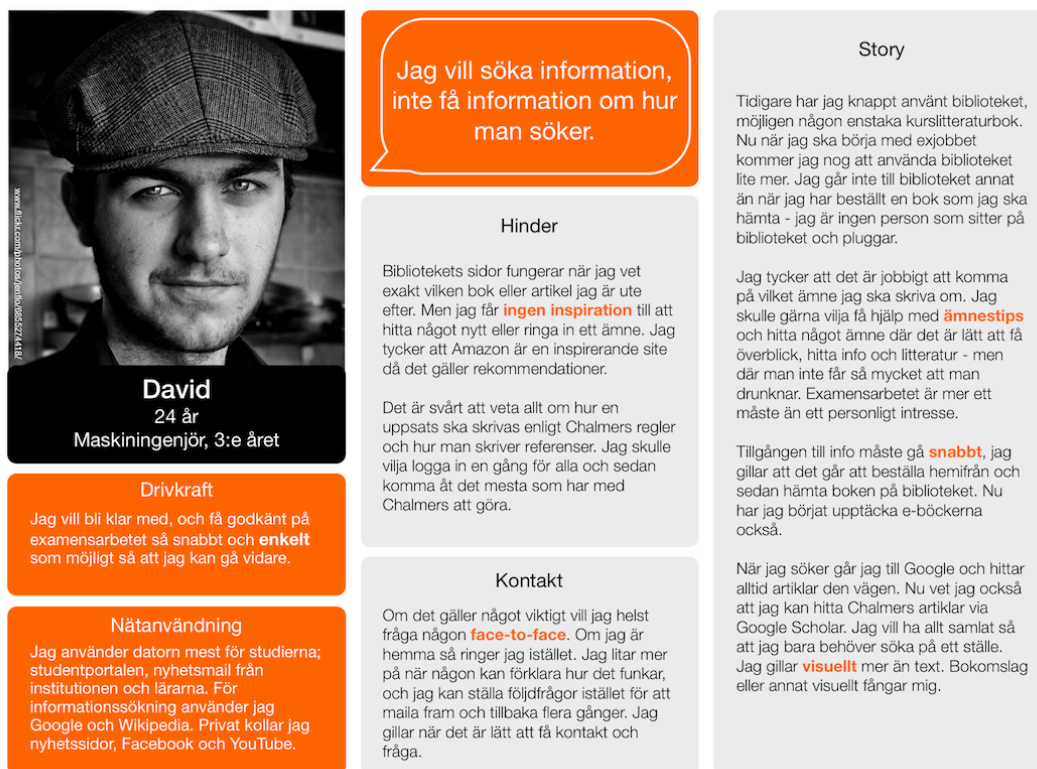
Get out of the building

Since the majority of users are not located within the walls of the library it is crucial that the library goes out of the building to meet and learn about its users in their own environment. By performing user interviews using open questions and asking them to describe what they are doing in their interaction with the library, but also telling us how they study or conduct their research. In doing so patterns of user behavior will emerge. By grouping patterns of user behavior libraries can create specific personas to represent user behavior.

> *A persona is not the same as an archetype or a person. As it has been described,*
>
> *the special aspect of a persona description is that you do not look at the entire person but use the focus area as a lens to highlight the relevant attitudes and the specific context associated with these.* (Nielsen, p. 7)

Personas are based upon actual user behavior but are not real people.
A persona is based upon behavior and not opinions on behavior by librarians or other stakeholders.

Jag vill söka information, inte få information om hur man söker.

David
24 år
Maskiningenjör, 3:e året

Drivkraft
Jag vill bli klar med, och få godkänt på examensarbetet så snabbt och **enkelt** som möjligt så att jag kan gå vidare.

Nätanvändning
Jag använder datorn mest för studierna; studentportalen, nyhetsmail från institutionen och lärarna. För informationssökning använder jag Google och Wikipedia. Privat kollar jag nyhetssidor, Facebook och YouTube.

Hinder
Bibliotekets sidor fungerar när jag vet exakt vilken bok eller artikel jag är ute efter. Men jag får **ingen inspiration** till att hitta något nytt eller ringa in ett ämne. Jag tycker att Amazon är en inspirerande site då det gäller rekommendationer.

Det är svårt att veta allt om hur en uppsats ska skrivas enligt Chalmers regler och hur man skriver referenser. Jag skulle vilja logga in en gång för alla och sedan komma åt det mesta som har med Chalmers att göra.

Kontakt
Om det gäller något viktigt vill jag helst fråga någon **face-to-face**. Om jag är hemma så ringer jag istället. Jag litar mer på när någon kan förklara hur det funkar, och jag kan ställa följdfrågor istället för att maila fram och tillbaka flera gånger. Jag gillar när det är lätt att få kontakt och fråga.

Story

Tidigare har jag knappt använt biblioteket, möjligen någon enstaka kurslitteraturbok. Nu när jag ska börja med exjobbet kommer jag nog att använda biblioteket lite mer. Jag går inte till biblioteket annat än när jag har beställt en bok som jag ska hämta - jag är ingen person som sitter på biblioteket och pluggar.

Jag tycker att det är jobbigt att komma på vilket ämne jag ska skriva om. Jag skulle gärna vilja få hjälp med **ämnestips** och hitta något ämne där det är lätt att få överblick, hitta info och litteratur - men där man inte får så mycket att man drunknar. Examensarbetet är mer ett måste än ett personligt intresse.

Tillgången till info måste gå **snabbt**, jag gillar att det går att beställa hemifrån och sedan hämta boken på biblioteket. Nu har jag börjat upptäcka e-böckerna också.

När jag söker går jag till Google och hittar alltid artiklar den vägen. Nu vet jag också att jag kan hitta Chalmers artiklar via Google Scholar. Jag vill ha allt samlat så att jag bara behöver söka på ett ställe. Jag gillar **visuellt** mer än text. Bokomslag eller annat visuellt fångar mig.

Figure 3: David, one of three personas used by Chalmers Library during the re-design of library webpages.

Meet David one of Chalmers three personas used for developing a new website. (Olofsson) The persona description tells us about David so that we can connect. He has a name, age and profile. The profile tells us about how he is using the Internet, what motivates him, obstacles, how he prefers to interact with the library and a story describing his situation as he searches for information. The persona is highlighted with a quote from an actual user interview.

By focusing on what the users are doing and not focusing on what the users are saying that they are doing libraries can avoid making design mistakes. It is common user behavior to please the interviewers or to be too critical. As the interview results are being processed the focus should not be on what the user said that they where doing but on the behavior of the user. In user centered design there is a famous cartoon showcasing the different perspectives on what a product should look like. Different professional roles describe what they think a swing

should look like and what the customer needs. But in the end what the customer really needed was a very simple solution. (CartouCHe)

As we interview the users it is important to keep in mind that the users are not tasked to solve the libraries problems. It would be equally wrong to ask the librarians to solve the problems based on their own opinions.

> *"One of the worst ways of approaching design is to let the customers do it. Customers are good at pointing out a need, a pain point in the market, but they are lousy at solving the problem."* (Werby*)*

If you ask the users what they want and how they want to solve a problem you will end up with specific and detailed needs. Another famous example of this is when Homer Simpson designed a car in the episode *"Oh Brother, Where Art Thou?"* in the tv-series The Simpsons. The car Homer designs is everything he wants, but unfortunately for the car maker the design is so Homer-specific that there is no one else who is interested in buying it and the factory goes bankrupt. (Oh, Brother, Where Art Thou?)

It is important for libraries to get out of the building to engage with our users on what they are doing. By focusing on what they are doing, their context and not what they are saying that they need, we will receive data that can fuel the design of services adapted to user needs and behavior. Services that will fit with usage patterns, that are natural and intuitive.

As the context of our library is changing there are some questions that we need to ask again and again, for each project or strategic plan.

Who are the people we are designing for? What is the activity (or activities) that they are trying to do? And what are the contexts in which they try to operate? (Anderson, 2009)

Moving forward
Chalmers Library is still exploring the possibilities and challenges of working with agile development and management. It is an iterative and evolving process, but the benefits far outweigh the drawbacks as the organization can learn and respond to change, re-prioritize how resources are allocated, avoid knowledge silos, build strong teams and identify uncertainties early.

As the library organization at Chalmers continue to evolve and in our efforts to offer services of real value to students and researchers agile principles are slowly finding its way to the core values of operations. Scrum is now just one of the methods being used as library staff explores Lean UX, Kanban, Scrum-ban, how to use value curves, impact maps, creating Minimum Viable products are others.

Introducing agile principles to the library has sparked a heated debate amongst staff on what we do and why. Agile methods surfaces values and high-lights differences in opinion, therefore it takes a mature group of staff to work with them but if successful the library can adapt and respond to changes and deliver services of high value for the users.

The steps described in this paper are nothing but baby steps as we leap forward.

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