Capturing the design process: documentation, reflection, and reuse

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Fånga design processen: dokumentation, reflection och återanvändning

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Degree Project in Computer Science and Communication, Second Cycle (DA222X), 30 credits
Degree Programme in Media Technology, 300 credits
Master’s Programme, Human-Computer Interaction, 120 credits
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2017-06-08
ABSTRACT

In a design agency, where time is of essence, it is interesting to see how documentation and reflection, of the design process can be captured by a digital tool with the aim to reuse design. In this thesis, such a tool was deployed at the design agency Apegroup. The main question this study investigates, is the challenge and benefit of a tool that enhances documentation, reflection, and reusability of a design process. The tool was primary inspired by the Computer Supported Cooperative Work and Documenting Design Process area. Interviews, ideation, prototyping, coding, testing and evaluation is some of the activities that were conducted.

The results revealed that different design roles values different elements during the design process, which makes it challenging to develop a tool that has value for all. Documentation of activities in the tool was mainly beneficial for the role design director and the value of gathering all internal information about the design process. Reflection of activities in the tool made some of the designers reflect more, but it was challenging to engage all designers. Working with reusability was challenging due to the tool’s need of being used continuously. In the design agency context, the most challenging aspect was time, and competing with the designers’ perceived benefit.

SAMMANFATTNING


Resultaten visade att olika design roller värderar olika ting under design processen, vilket gör det utmanande att utveckla verktyg som har värde för alla. Dokumentering av aktiviteter i verket hade mest fördelar för rollen design director och det stora värdet av att samla intern dokumentation om design processen. Att reflektera över aktiviteter i verktyget fick vissa designers att reflektera mer, men det var utmanande att engagera alla. Att arbeta med återanvändning är utmanade då verktyget kräver kontinuerligt användande för att få ut det maximala värdet. I design agentur kontextet, var det mest utmanande aspekten tid och att utmana designers uppleva fördel under en hela design processen.
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In a design agency, where time is of essence, it is interesting to see how documentation and reflection, of the design process can be captured by a digital tool with the aim to reuse design. In this thesis, such a tool was deployed at the design agency Apegroup. The main question this study investigates, is the challenge and benefit of a tool that enhances documentation, reflection, and reusability of a design process. The tool was primarily inspired by the Computer Supported Cooperative Work and Documenting Design Process area. Interviews, ideation, prototyping, coding, testing and evaluation is some of the activities that were conducted. The results revealed that different design roles values different elements during the design process, which makes it challenging to develop a tool that has value for all. Documentation of activities in the tool was mainly beneficial for the role design director and the value of gathering all internal information about the design process. Reflection of activities in the tool made some of the designers reflect more, but it was challenging to engage all designers. Working with reusability was challenging due to the tool’s need of being used continuously. In the design agency context, the most challenging aspect was time, and competing with the designers’ perceived benefit.

Author Keywords
Design process; Design documentation; Design reflection; Reusable design;

INTRODUCTION

Traditionally, when comparing designers, one only scrutinized the end product and did not consider the process at all [8, p. 3]. In the 70s the realization that the process should be open for examination and evaluation resulted in models that described the design process [8. p.19]. This way of mapping the process from the beginning to the end was a way of understanding more about design and designers. Fallman [3] also explores what designers really do and what design is within the Human Computer Interaction (HCI) field. By identifying three different accounts: conservative, romantic and pragmatic. He points out how they approach the problem of design in different ways, but also how one or more of the accounts cannot be neglected. If one would focus on the process in the different accounts, the conservative account highly values the process and is followed strictly with two important blocks: analysis and synthesis. The romantic account values the opposite. The process is of little value and the result is everything. In the pragmatic account the process is a reflective dialog with the materials and the given situation. Thus, the product is the result of the iterative conversation, which also is the same definition Schön [21, p. 135] uses to describe a design process.

The nature of a designer can hence be seen as diverse and the approach to get to a result can vary from designer to designer depending on the situation and problem. One challenge is to capture the design process and design choices within a project which can be time-consuming. This makes it relevant to choose what is important to capture, by whom, and what value it brings. Documentation has lately encountered some resistance since it is time-consuming and does not communicate well in agile settings [22]. Dalsgaard and Bardzell [5] mentioned three activities that can fulfill many purposes in design research documentation: design activities, research activities and auxiliary activities. By documenting design activities they can serve as a repository of inspiration, research activities have data that can be analyzed, and auxiliary activities to support the designers with external communication.

Apegroup is a design agency founded 2001 with the aim to help other companies with design, development, content, and business of digital products. This study will only target the design team who was in need of an internal tool that focus on their design process: How to document and reflect on it, and in the long term reuse their design. They did not feel that any commercial tools have engaged the design team in such activities earlier and wanted the author to explore a way of doing that.

This study explores how a design agency like Apegroup can work with documentation and reflection in their design process in a digital way, and in the long run reuse design activities and insights. The aim is to investigate the design team’s current needs and pain points in their natural work context, and with those insights generate a concept that in the end will be built and tested within this study. The study will answer following questions:

• What are the needs and wants for different design roles for such a tool, and what role is it more suitable for in a design agency context as Apegroup?
• How can a potential design solution for the tool look and function?
• What are the challenges and benefits of a tool that helps the designers document and reflect on their design process with the aim to reuse design in the long run?

BACKGROUND
This section outlines previous work, mainly of different approaches and tools that has been used in either documentation, reflection, or informational sharing to a group of people. The previous work has been an inspiration of what has been done before in the field.

Software documentation
Documentation is one of the oldest ways to help users interact with software [11]. There have been several studies that have investigated how people interact with software with the help of documentation. Loggem and Lundin [12] looked specifically at how documentation supports the usage of new software. In their study it was evident that the user reads the information in the documentation, which contradicts other studies [14, 15, 16]. Even though the users found information that would help them achieve their goal, they failed regardless when trying to interact with the system. The users also showed a behavior of returning to already read topics in the documentation. Loggem has also in another study [13] investigated how users interact with software to complete a goal and how they eventually will become experts with the help of the Computer-Mediated Activity (CMA) model. The CMA model helped the user break down the design problem into manageable parts.

Computer Supported Cooperative Work
Computer Supported Cooperative Work (CSCW) was first introduced in 1984 by Paul Cashman and Irene Greif at a series of conferences. The aim was to explore how individuals work in groups and how technology can support them [21]. From the conference they discovered the limitless potential of supporting collaboration, but at the same time realized the challenge of developing interfaces for a team with contrasting background, roles and preferences. From that date, numerous of tools had been created to explore this further. CSCW has been particular interested in information: how to use, maintain and reuse it. Early on, several repository-model systems where created to manage knowledge in different ways [29].

There have been different focus areas on how to use CSCW systems. For example Tapestry’s system focused on using tags and filters [30], while OVAL [31] concentrated on only the sharing aspect. One system, called Answer Garden, had a different approach by growing information where it is needed. This way of creating information was difficult. The difficult part was to motivate users to manage and create information to maintain the system itself [32, 6]. The reason for this found to be the lack for reward, especially within groups in a company with lower level roles.

Documenting design processes
There exist few tools developed for the purpose of capturing design processes with the goal to reflect on it during the process. In the study Reflective design Documentation, a documentation tool was created to enhance reflection about design as a part of research [4]. The tool, called the Project Reflection Tool (PRT) was used in different projects with the aim to detect challenges and benefits in deploying the PRT in several projects. Information capture has it challenges, and the main one is to know what to capture and on what level of detail. The process itself of capturing needs to be quick and direct since it takes time to document and reflect. It is also important to support the designer itself, the challenge of understanding how the designer can benefit from the task or at least perceive the benefit from doing additional work in form of documenting [6]. In another study, Dalsgaard [2] suggests using a series of maps that will help designers capture, analyze and reflect on their design processes. There exist three types of maps for reflection, and these are: Overview, Strand, and Focal. These maps have different scope of use and limitations. The overview map is for spotting big trends and changes in the process, the strand map focuses on cohesive reflection of ideas, and the focal map is for detailed analysis of a specific event. The maps are therefore good to use together if understood correctly. They will then offer a unique and organized approach to document and understand the inter-relation between inspiration, design materials, and experiments.

Jarvis [9] explored documenting a design process with a format of a photography-essay to describe different stages of the process. The exploration resulted in one main insight: Photographs are a natural medium to use in documentary. It communicates well with the design thinking and process, and is well integrated in the design process. But photographs are also limited due to not being able to capture animation, or spatial and tactile quality.

Design workbooks was a method suggested by Gaver [10], which was a structured way of collecting design proposals and other material over time during several projects. The workbook enhanced slowly growing ideas that thrive over time and that eventually emerge from multiple ideas and members within the team. It was also effective for internal discussion, reflection and design exploration. The downside with this reflective practice was the time it takes to develop.

Design Rationale
Instead of looking at how to capture a design process, it can be interesting to understand how a continuous activity of documentation can affect the design decisions in a project. This area is called Design Rationale and has existed since the 90s [17]. According to Lee [18], design rationale of good documentation quality will lead to improved quality of both the product and the design process.

Falessi, Cantone, and Becker [19] explored how Design Decision Rationale Documentation (DDRD) affect
decision making on both individual and team level. In the study they suggested a specific technique to document design rationale, the parameters efficiency and effectiveness were evaluated. The results revealed that the documentation helped the effectiveness of both individual and team decision making, but that efficiency was not affected. According to [20] DDRD has several advantages, such as design verification, design evaluation, design maintenance, design reuse, design teaching, design communication, design assistance, and design documentation.

**METHOD**

The process contained eight different methods that was grouped into five stages: interviews, ideation, usability testing, development, and testing and evaluation. All methods will be presented in this section, with an explanation of what has been done, how, and why. Throughout the process, User-Centred Design has been applied to help the tool meet the needs of the target group [25].

**Interviews**

There exists different formats and structures on interviews depending on the conditions and aim [1]. In this work semi-structured interviews were conducted with 11 of 13 designers at Apegroup in a one-to-one setting. Each interview lasted about one hour and was conducted in Swedish. Before the interviews, a consent form was handed out, and all interviews were recorded. The aim with the interviews were to get an understanding of the designers’ different roles, and identify needs, pain points and challenges at work.

The questions in the interview template were structured around five pillars: the designer’s role and challenges, processes and methods, documentation, reflection and feedback, and lastly knowledge sharing.

**Ideation**

To tackle the massive output from the interviews, and convert the insight to more concrete problems, ideas and potential solutions, following activities were conducted: *How Might We, Impact Mapping and Design Studio.*

*How Might We (HMW)* is a method that can be used after gaining insights with the goal to find opportunities. This is done by converting insights to challenges and beginning the sentence with ‘How might we’. This rephrasing helps with innovative thinking and suggest that there exists one or several solutions [23].

*Impact Mapping,* helps align projects by answering four important questions: *why, who, how,* and *what,* in that particular order. *Why* aims to understand why we are doing this, and thus present goals with the tool. *Who* is referring to who the users of the tool are. *How* looks at the users in context with the goals, identifying what impacts are wanted. *What,* defines a scope and functionalities that can help the users create the impact wanted [24]. The *how* section was made in combination with a workshop called Design Studio. The workshop lasted for two hours where the first half contained of a discussion about the scope and functions of the tool. The second half focused on rapid sketching, presenting sketches and to gather feedback. This process was repeated to refine ideas and sketches.

**Usability testing**

From the ideation and creation phase, five prototypes were created by the author through wireframing in Sketch and prototyping in Invision. Sketch is a vector based wireframing tool, and Invision is a prototyping tool that produces high-fidelity prototypes rapidly [27, 28]. Since the target group was small, two iterations of usability tests were conducted to get as much input as possible on different details. The first iteration focused on navigation and to get an overall insight of how the users use the tool. The second iteration focused on choosing one of the variations, and re-designing some elements in the prototype that were problematic. In the first iteration, three prototypes were tested by three users and in the second iteration two prototypes were tested by two users. All tests were conducted by a think aloud, where the target group were asked to perform different tasks and say what they were thinking while performing the tasks [26].

**Development**

The aim with the development was to make a tool that can be tested in a real project. The goal with the tool was to explore a way to engage in documentation and reflection while fostering reusability in a design process. The tool was developed by the author in the framework AngularJS and connected with Firebase as database.

**Live testing and Evaluation**

The tool was tested in a real project at Apegroup that lasted for 17 working days. A design team of three people tested the tool, and three other sub-users had access to the tool, but did not have an active task to perform during the test period. Data from the test period were gathered through the database and the service Hotjar. When the test period had ended, two group interviews were conducted with the aim to get response of how the tool worked in their work context, the challenges and benefits of the tool.

**RESULT**

The results present findings from the interviews, impact map, usability tests, live testing and evaluation. The interviews will highlight the main results from different needs for different designers. The impact map will reveal the true goal for Apegroup to have this tool, whom it is most suitable for, and how the goals can be achieved. The usability tests will explain some of the main insights from the first design of the tool. The live testing will reveal how the designers used the tool, and how often. This was afterwards combined with two small interviews with the aim to understand the teams challenges and benefits with the tool. After this section the final design of the tool will be presented.
Two of the challenges (flexible role and produce when feeling uninspired) were mentioned by two designers within the same role. The majority of the challenges between roles were mostly connected to communication.

“We kind of don’t [communicate our design choices]. Very ad hoc (…) Continuity does not really exist here.”

- UX designer

A followup question was asked regarding if anything could ease the challenge or other aspects in their work process. A Design Director mentioned the need for a toolkit:

“The important thing is that we have some consensus on what is included in this toolbox in each phase and that everyone understands it. That there is documented somewhere. That you may be able to evaluate these tools (…). Much depends on who you happen to get in a project. That's negative. It should not be so person-dependent, it should be more a… one way we as a business tackle problems”

- Design Director

Processes and methods

Only 6/11 designers were aware of Apegroup’s general process document. The majority of the ones who knew were designers with a more senior role. An opinion from a design director of what is important about processes:

“It is important that all have the same idea of what a process is. It needs to be rigid, but in the same way be Apegroup’s way of doing things, independent of who you are getting in your team, it should be Apegroup’s deliverable. But, in the same way it is needs to be elastic to work in different projects”

- Design Director

Figure 2. Visualization of options on process.

There were in total 24 unique opinions on process and methods (see figure 2). 15 of these 24 opinions were individual opinions. 7 of the 24 options were opinions between roles, and were about a perceived nagging of processes and that a clear general process is not available. Two opinions from two designers:

Interviews

Within the design team, the 11 designers have different roles. The following roles were interviewed: Art Director (2), Design Director (3), Copywriter (1), Digital Analyst (1), UX designer (2), Visual Designer (1), and Head of Design (1). Table 1 shows an overview of each role and how the designers described what they do.

Table 1. Overview over the designers roles.

<table>
<thead>
<tr>
<th>Role description</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work with concepts, graphic production and visualize projects.</td>
<td>Art Director</td>
</tr>
<tr>
<td>Work with the visual aspects of design.</td>
<td>Visual Designer</td>
</tr>
<tr>
<td>Work with research, concept, wireframes, and focus on interaction and structure of digital services.</td>
<td>UX Designer</td>
</tr>
<tr>
<td>Produce text.</td>
<td>Copywriter</td>
</tr>
<tr>
<td>Combine design, analysis, strategy.</td>
<td>Digital Analyst</td>
</tr>
<tr>
<td>Leads design work, and ultimately responsible for design questions, deliverables and the design team.</td>
<td>Design Director</td>
</tr>
<tr>
<td>Leads the design team, but have a design director role in projects.</td>
<td>Head of Design</td>
</tr>
</tbody>
</table>

In figure 1 and figure 2, the text color and size have a specific meaning. The size stands for how many designers had said similar things, and the color represents if the opinion was shared between (white) or within (black) roles. For example, if the size is three times the smallest size and has the color black, it means that three designers within the same role has the same opinion.

Challenges

In total 22 unique challenges (see figure 1) were mentioned by the designers. 16 of these 22 challenges were individual challenges. From the individual challenges the most interesting challenges were mentioned by the designers with more general responsibility over design. A Design Director expressed the following as a main challenge:

“‘To understand the projects challenges. To know how to prioritize the time we have on different activities”

- Design Director

Figure 1. Visualization of challenges.
“It feels like it comes a new idea of a new process once a week, maybe that is why one has stopped absorbing the new information.”
- Art Director

“We are changing all the time, we have never worked after the same template.”
- Art Director

Some had good notion about general processes and project types connected to those. These were more senior designers who also are the ones driving the processes:

“It is the design directors responsibility that a process and similar is being followed in projects.”
- Design Director

**Documentation**

18 tools for documentation were mentioned during the interviews. The most frequent documentation tools mentioned were: Dropbox, Confluence, Keynote, and Slack. 8-12 of the tools mentioned were only mentioned by 1-2 designers. The majority of the designers mentioned that there is often little time for documentation and that internal documentation is scattered. There was a perceived difference between how much the designers individually documented. Some documented all the time, while others said they do not write down anything in terms of documentation.

**Reflection and feedback**

20 unique opinions on reflection and feedback, where 9/20 opinions were shared between roles. The main activity mentioned was reviews. Reviews is an activity in the middle of a project, with the aim to give feedback. The second main activity was retrospective, which is at the end of each project with the aim to reflect on three good things, three bad things and three improvements. Otherwise, there exists reflection and feedback activity on an individual level. The activity of reflection and feedback varied within the design team.

Common for feedback activities as reviews, and individual feedback was that it is hard to give feedback on a structured level. This can result in a spontaneous feedback process that can give irrelevant feedback.

“Yes, pretty often. It is little hard to capture. We discuss it [feedback] much in a relative unstructured way.”
- UX Designer

A few designers mentioned retrospectives, and say that they do not really learn from them. The learnings stays within the team and is documented through email. A designer expressed the following:

“They are very good, but the problem is that they do not lead anywhere. We are to focused on isolating learnings within projects, how they are documented is also isolated within projects”
- UX Designer

**Knowledge sharing**

Slack was the dominant tool associated with knowledge sharing. In total, there were 22 unique opinions on knowledge sharing, were 16 of 22 were individual opinions. These focused on confirming sharing of knowledge within the company, but is not structured and captured in a good way.

“We have very good processes for knowledge sharing, but we do not have good processes to remember it afterwards. We are very much about meeting, talking and presenting.”
- UX Designer

It was mentioned that there exists both formal and informal ways of sharing. Some believed that knowledge sharing on Apegroup only reaches a few employees, and that everyone has not got a chance to know everything.

**Impact map**

From the interviews and HMW-insights, hypothesis were created. These were summarized in the impact map which explains: why the tool is of value, who it is for, how the wanted impact can be achieved, and what the scope of the tool is.

**Why are we doing this?**

The reason for Apegroup to have a digital tool during the design process resulted in five reasons. These are presented in bullets A-E, where the order is unimportant.

A. Capture and share knowledge within the design team about project processes and methods.

B. Capture Apegroup’s way of working, and hence reuse design

C. Increase continuity in reflection within the design team.

D. Increase reflection continuity on specific methods in context to a project

E. Increase overview and insights of projects

**Who are we doing it for?**

The primary user which had most focus in the tool was the design director, who has the power over the design process during a project. The secondary user was the other design directors who are affected by the content made over time. The third user were the other designers who are involved in a project or want to learn more about what is happening in the tool.

**How are we going to do it?**

The results in this section are linked to the why section’s A-E. For example, the A in the why section is linked to the A in the how section.

A. Create projects, activities in projects and also be able to create methods
B. Create content over time and reuse that content
C. Engage the designers through giving insights and reflections.
D. Be able to reflect on specific methods in a project
E. Be able to view projects and methods

What should it be?
The discussion about the scope of the tool resulted in a mind map (figure 4) which became the base for the sketching part at the workshop. Projects and activities became two main features that was prioritized during the sketching phase. The sketching phase resulted in total 12 sketches. Four iterations of different views was created of the tool.

Figure 3. A Mind map that describes the scope of the tool.

Usability test on prototypes
Before the development phase the author created different prototypes with the aim to explore various elements and types of navigations in the tool. A spontaneous feeling was also wanted from the main target group (design directors) to see what they thought of the tool and how it correlated to the ideas they had in the workshop. The main insights from the user tests are highlighted.

First iteration
Three different combinations of navigation were tested. It was evident that the prototype with the filtration in the content and having the filtration visible in the detailed view was the best combination for accomplishing the given tasks. In prototype 1, the search bar got visually neglected by the user, and in prototype 3 when the filtering was hidden resulted in the user having major problems with navigating back.

Other than the navigation, there were other comments on the prototypes. The main comments were about what input fields are relevant and if they should be input text field or not. For example, when creating a project, the “project type” input field should not be free text. There only exist three project types, and therefore one should be able to choose between a given list. It also felt laborious to choose a date for an activity in the project view, and the [+] button in figure 4 was misinterpreted. It was misinterpreted as a button that would add an insight from a project, which was wrong.

Figure 4. Detail view of an activity in toolkit.

Second iteration
The second iteration focused on improving different elements from the first test. The main improvement regarded designing a “status” element when adding an activity in the project view. Instead of writing a date, one could choose a state (todo, doing or done). Status were preferred over date as input.

Live testing
After the insights from the user test, and the development phase were done, the tool was deployed into a real project at Apegroup. During the test period, all sessions over 30 seconds were recorded in Hotjar. Quantitative data was also gathered such as active users, how many times activities and projects were added. The design team that had access to the tool consisted of one design director, one UX designer and one art director.

Activity and Engagement
In figure 5, the graph shows each day of the test period on the X-axis and quantity on the Y-axis. Active users, added activities in toolkit, added activities in project, and edit activities in projects were measured.

Figure 5. The activity during each day of the test period. Only working days are included.
nevertheless a challenging tool. They said that the tool is good for sharing information in projects, but is The rest of the design directors agreed upon that the tool mostly interacted in the ongoing project view. During the process itself, it loses some direct value. When clicking into a project, a detailed view of the project appears (figure 7). In this view there are two parts: The first part contains static information about the project, such as name, brief, deliverables, and which designers are in that project. The other part is interactive, and has a feature called activities that works like a timeline. In the beginning of a project the activities timeline is empty, but as the project progresses, activities are added from the toolkit. This enables the user to reuse content and capture the process.

User behaviour
Four types of user behaviour in the tool was evident.
1. Add an activity in toolkit and later add it in project
2. Add activity in toolkit without completing the session
3. Adding activity in project and updating other existing activities
4. Looking around in the project page, opening and closing the activity modal without any action.

Evaluation
After the test period opinions from the design team that actively used the tool, and also from the other design directors who passively used the tool were gathered. Both groups framed challenges and benefits with the tool as well as how they felt that the tool engaged their needs. Improvements for future use was also suggested.

Design Team
All three designers thought that the tool brought value. The tool helped gather valuable information in one place over time, and they expressed that the tool is good for other employees in the company that are curious about what is going in different projects. The tool is most valuable in the beginning of a project and at the end. During the process itself, it loses some direct value. This was especially true for the UX designer and the art director who did not interact with the tool that much. In this project both were dependent on manual reminders.

The design director experienced that the tool made him plan more in comparison to before, and also that the activity of reflecting and writing was increased. It was natural to set an activity to done and right after writing an insight. He also mentioned that he thinks it is important to use the tool continuously during a project, otherwise the value decreases. The design director suggested to use the tool in physical activities, such as meetings and retrospectives would raise the value during the process. During the project phase the design director mostly interacted in the ongoing project view.

Other Design Directors
The rest of the design directors agreed upon that the tool is good for sharing information in projects, but is nevertheless a challenging tool. They said that the tool requires a behavioural change and needs to be used continuously. Also, the value increases as the information and content increases which also will make the documentation on the process quicker. One of the design directors who passively used the tool that much. In total seven activities was added to both the activity timeline and to the toolkit.

Desired elements
There were 8 elements that felt missing in the tool, these were: push notifications, input in “add project” that specifies client, vertical timeline, bullet points in insights, link files, edit content, differentiate between ongoing projects and done projects, add deliverables in a project, and drag/drop in the timeline.

Redundant elements
There were 4 elements that were redundant in the tool, these were all in the page “add activity in toolkit”: the input “level of difficulty”, the input “Participants”, the input “material”, and the input “short description” should be changed to “Why are we doing this”.

FINAL DESIGN
Based on findings from the previous research activities, screen shots from the tool during the test period will be presented and how each page functions. The functions and elements of the tool will be explained, and also how the impact map (A-E) was included in the design.

Projects overview
The project overview is the first view after logging in. An overview of all projects are visible which enables the user to get a summery of different projects by filtering (E). The user can filter projects depending on project type or search directly in the search field. When hovering over a specific project one can see who created the project and the other designers who are in that project.

Add project
From the project overview one can click on “Add new project” to create a new project. This enables the documentation of projects (A). There are in total 4 fields that needs to be completed: project name, project type, designers, and project brief.

Project detail
When clicking into a project, a detailed view of the project appears (figure 7). In this view there are two parts: The first part contains static information about the project, such as name, brief, deliverables, and which designers are in that project. The other part is interactive, and has a feature called activities that works like a timeline. In the beginning of a project the activities timeline is empty, but as the project progresses, activities are added from the toolkit. This enables the user to reuse content and capture the process (A, B).
To add an activity, the user clicks on the box “Add activity” which always is first in line. When clicked on, a modal will pop up, where the user can choose an activity and status (todo, doing or done). When the activity is added, it will appear in the timeline. The order in the timeline is ordered by status, which means that the upcoming activities are prioritized to the left, then doing and last done. To switch status on an activity the user can click on the wanted activity, and a modal will appear where the user can choose to add an insight from that activity (A, D). An activity can always be deleted. If an insight is added, that insight will show in the box of the activity in the timeline. All designers who has access to the tool can both create activities and reflect on them (A, C).

Add design activity in the toolkit
From the toolkit, one can click on “Add new activity” to create a new activity to share new design activities hence gather a way of working (A, B). There are in total 8 fields that needs to completed: activity name, short description, materials needed, duration, what type of people are expected to participate, activity type, level of difficulty, and a long more detailed description about the activity.

Design activity detail in the toolkit
When clicking on an activity a detailed view appears (see figure 10). In this view statical information is displayed about that specific activity such as: name, description, materials, type, timeframe, participants, used in X projects, and level of difficulty. Below this static information insights exists. There, all the insights are gathered from that activity (A, E). There one can see who was written the insight, and from what project it was used in. These insights are thus linked to the insights from the projects. From this view one also can add this specific activity to a project (B).

DISCUSSION
The results will be discussed in relation to the designers’ needs, the tools challenges and benefits in documentation, reflection, reusability, and work context. Suggested improvements will also be presented.
Value of tool in the design role

Depending on the design role, the designer values different elements during the work process. In this section the design director role versus the other design roles will be discussed: How the tool met their needs, and what value was created during the test period.

**Design Directors**

In the interviews, it was evident that the design director had a leading role in design projects, such as being in charge of planning which design activities should be in the design process. It was also distinguishable that the role embraces the importance of a process that is communicated to the rest of the design team, and mirrors Apegroup’s way of working and tackles problems. From the small interviews with the design director it was evident that the tool provided real value. The primary value was the gathering of information in one place, and the ability to share insights with the whole company. He also expressed that the tool had most value in the beginning of a project or at the end. Thus the value and drive to use the tool during a project was less. The reason may be because the tool in the begging and in the end can be used together with the rest of the designers. Hence the combination of sharing planned or done activities together with the other designers seemed to be more of value than using the tool alone during a project. Although, the design director knew he was creating value by adding content during a project, he did not feel the direct benefit from using the tool at that point. It was challenging to truly understand the designers drive during the entire design process. Similar to Fallman’s theory, it is important to understanding the benefit from using the tool [6]. How can the value during the process be increased when documenting activities? In this case, it was about focusing on details in a project, and capture them shortly and swiftly as mentioned by Dalsgaard [4]. The value can be greater during a project if the design director uses the tool in active such as: startup meetings, midpoint reviews, retrospectives and similar activities where the project team is gathered. Hence, the usage of the tool requires a behavioural change in the design process to some extent.

**Other designers**

It was more difficult to find a common challenge or need for the rest of the designers because of their different roles [21], but the common themes that occurred were the tiredness of talk of processes, lack of design communication, and unstructured and inefficient ways of capturing insights from projects. The goal with the tool for the other designers were to be able to see the design process and give insights in a more structured and continuous way. After the test period, it was evident that the UX designer and art director did not use the tool that much. It mostly depended on that they were not used to do this kind of activity on their own, but used the tool when they got a reminder. Since the design director was the prime user, the other designers’ need were not fully met which resulted in lack of perceived benefit [6]. The UX designer and the art director both agreed on that there exist value for other designers from an overview perspective, but the engagement during a project was too low for them. They suggested push notifications as a solution naturally engage when it is needed.

**Challenges and benefits**

The benefits and challenges of the tool will be presented in the themes documentation, reflection, reusability and work context. Some of the themes are explored more in this study than others, but the aim of the tool was to work with all themes and from that also see what the potential benefits and challenges may be.

**Documentation**

Generally at Apegroup, there is little time for documentation, and the documentation activity varies from designer to designer. It was also evident from the interviews that internal documentation is spread out. The main benefit from using the tool in terms of documentation was the convenience of having everything gathered in one place, which was missing before. Creation of content in the tool was challenging, and it was only 1/3 designers who added new content. The author suggests that only the designer who is in charge of the process should be the one in charge of adding new content during the process, and thus not involve the other designers unless they want to. It was indeed difficult to grow user generated content as Ackerman implied. In this case, it seemed to have with the lack of reminders and time, rather than lack of reward and motivation [32, 33]. Forgetting to use the tool and feeling time-pressured can also derive in lack of motivation, even though it was not explicitly said by the designers themselves. Since only the design director created and added content to the toolkit and activity timeline, it supports the fact that it more difficult to motivate employees that has a less leading role [32, 33].

From using the service Hotjar and looking at the user behaviour, it was evident that the design director mostly operated in the project page. He rarely went to the toolkit page. The reason for this may root in the decision of letting the design team grow information where it was needed during the test period. Since it was only one designer who added new activities to the toolkit, the view became redundant to the design director who used it. An initial workshop to add content in the tool might have increased the usage or perceived value.

**Reflection**

In the interviews, it emerged that the reflection and feedback process was poor at Apegroup. Words like: spontaneous, irrelevant, isolating, and unstructured were mentioned. Looking at the figure 12, it shows that 2/3 of the designers in the team used the insight function. The design director reflected on 5 activities and the UX designer on 2 activities. A challenge was thus to motivate everyone in the team to use the function.
A tool with a long-term reward is that it takes time to discuss and reflect about design. The downside of quality of the design work and contribute to more term. A theory is that the tool will raise the overall could complete the project without the tool. A challenge failed due to time pressure, and the feeling that he still directors that offered to test the tool spontaneously. As seen in the evaluation, one of the design designer’s insights by accident and read it, but never discussed it further.

In behaviour 4, the art director looked around in the tool. For example, opened and closed activities in the activity timeline of the project without taking any real action. A theory from seeing the behaviour is that he did not really now what to do, or he was looking for something. It can be that he clicked on the activities in the timeline to see other insights, but saw only the blank text area which did not engage him naturally. Thus, maybe if the other designers’ insights were visible in the modal he would have engaged. Nevertheless it was challenging to motivate all designers in the team to use the tool and see a direct value during the process.

Reusability
In the interviews, a design director talked about capturing Apegroup’s way of working in a toolbox and a way of capturing activities, reviewing them and then reusing them. This element was not explored that much during the test period, since only one project was active. Nevertheless the perceived main challenge and benefit of reusing activities could still be discussed after testing the tool. The clear benefit of reusing activities was that it will become faster to document them, but a challenge is to reach that level of content and continuity in the usage of the tool. As seen in figure 5, the tool was nearly used every other day. From the figure it was visible that at least one user was active 7 of the 17 days during the test period. It were also evident that there was more activity in the beginning of the test period which may indicate that in the long term it will be more difficult to use the tool continuously.

Work context
The tool is needed in this context to raise awareness about design activities, and eventually engage more designers to reflect continuously on their design activities. Although, to make this operate during work conditions of a design agency is challenging due to time pressure. As seen in the evaluation, one of the design directors that offered to test the tool spontaneously failed due to time pressure, and the feeling that he still could complete the project without the tool. A challenge is to see the possible long term value instead of short-term. A theory is that the tool will raise the overall quality of the design work and contribute to more discussion and reflection about design. The downside of a tool with a long-term reward is that it takes time to develop [10].

Suggested improvements
The main improvement would be to include the other designers more in the tool. A solution can be to send a push notification through slack or mail when the design director has made an update in the project, and in that push encourage to write an insight. Another solution could be to assign the different activities to the project members and thus give them greater responsibility in the tool. In the project view a desire to link files would have been appreciated in terms of documentation, this was especially true for roles as art directors. As Jarvis [9] states, photographs are a natural medium in documentary and communicates well. It would have been interesting to see if the designers would have uploaded photos or other files from the process. This was actually a part of the prototype, but due to time constraints was never developed.

When writing an insight it would have been interesting to work with different formats, for example, be able to view all the other insights in the modal or inspiring the designers by having them write three insights in bullet points. The last suggestion would be to edit the content. The restriction of not being able to edit content probably derived to behaviour 2, which was an unwanted behaviour.

CONCLUSION
A series of activities were made to understand the designers’ needs and pain points in their design process at a design agency, and from that build and evaluate a digital tool. The primary value for the designers were the tool’s ability to gather relevant information about the design process and activities. The value of the tool during the process varied. In the beginning and in the end the tool had more value than during. By using the tool in physical work activities were the team is gathered were believed to raise the value during the process. Designers with a more leading role, in this case, the design director gained more value by using the tool. The value and engagement in the other roles were lower. The main challenges in terms of documentation, reflection, and reusability were to make everyone in the team participate and thus understand the perceived benefit for different roles throughout the process. It was suggested that by choosing a designer to be in charge of the documentation process. Push notifications where suggested to make other designers reflect more on specific activities. In terms of reusability it was difficult to use it continuously and think of the long term value. The main benefits in terms of documentation, reflection, and reusability were the gathering of valuable information about the design process which was missing before. In the end the tool had also the benefit of increasing reflection on design activities for the main user of the tool. In the context of a design agency, the most challenging aspect was time, and competing with the designers’ perceived benefit. Also to make the designers see beyond the most short-term efficient solution and instead embrace a way of working with design processes over longer periods, and in the end reuse activities and insights.
ACKNOWLEDGMENTS
I want to thank Jarmo Laaksolahtim, Nils Sköld, and Apegroup for their support in this journey.

REFERENCES


