Presenting information through a dashboard for Smart Video evaluations

The process of developing a design for a marketing dashboard

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Abstract

Using the internet for watching videos or online shopping keeps growing, along with video advertisement to increase online sales. To know if the video actually increases the online sales, the owner of a video ad wants to do follow ups on how the video is doing, and get statistics. A different solution from the original video ads is Smart Video. It is an interactive video player with a clickable slideshow of products. This video can get even more types of statistics than a normal video, and today that statistic is not accessible for the Smart Video clients, without the help of someone from the Smart Video team that can create a report for them. The purpose of this thesis was to relieve the workload of the Smart Video team and to create a dashboard that shows all information that the clients find relevant about their videos.

This paper is about the process of developing a design for a marketing dashboard, that follows the guidelines of information dashboard design by Stephen Few. The process included interviews, multiple designs, prototypes, and evaluations, before ending up with a prototype of a desktop solution that follows the aesthetics of Smart Video and can be realizable with the current technology.
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Chapter 1

Introduction

In the past six years, the use of the internet in Sweden has increased from 86% in 2011 to 94% in 2017 [7]. We have become more and more accustomed to the internet and we use it for various different things. One of those is watching movies or videos, and another one is shopping. We also spend more time online than before. In the same six-year period, 2011-2017, the number of Swedes who watch movies or videos daily online has increased from 8% to 27% [7]. Shopping online is also something that has become more common. Worldwide, the online sales have gone from 7.4% in 2015 to 10% in 2017 of the total retail sales [17]. In Sweden, shopping online has become something very common. One example is that, in 2017, 94-97% of Swedes in the ages between 26 and 55 years have bought things online that were delivered by mail [7].

While there are multiple advantages with shopping online, for example getting a lower price or comparing products easily [17], there are also reasons for why consumers choose to shop in a physical store. The three biggest reasons to why consumers shop in stores instead of online is that they want to see or touch the item first, they want to try them on, and they are concerned about the product looking different from the picture online [17].

This is where video advertisement come in, which will be referred to as video ad in this thesis. With the help of a video, it is easier to see what color the product is and how it looks on another person compared to a product card with only a picture of the product. The market online is huge and has millions of users, and video usage is increasing [7] as well as video ads [16]. At the same time, 29% of Swedish internet users use ad-blockers (i.e. software that removes advertisements from web-sites) [7], which is not good for the sales, because consumers who view a video are 81% more likely to purchase than non-viewers, and retailers mention a 40% increase in purchases as a result of a video [18].

There is a lot of different data that can be extracted from different types of
advertisements. The owner of a video ad wants to know how the video is doing, be able to follow up on and evaluate the campaign. One of the ways to follow up is to get statistics from the video itself, how many views it has had, how many clicks there are on products that are shown in the video, where geographically the views were, sales figures etc. The different video ads from a product called Smart Video can connect even more information, for example CTR (click through rate, total numbers of product clicks per total views/impressions). It can be a lot of data, which could be hard to read and understand if it is not sorted and displayed in a good and readable way.

One way to do this in a good way, is to use the concept of a dashboard, a visual display where important information can be monitored all at once [10] (see more in section 2.2).

1.1 Smart Video

This thesis was written in collaboration with the IT-consultant company Codemill\(^1\). They have their own product called Smart Video, an interactive video player where the main goal is to help e-businesses increase their online sales and turn videos into online stores.

When the video is playing, the viewer can watch the items that are used in the video in a clickable slideshow. When an item is clicked, a URL that is connected to the item is opened in a different tab.

There are four different types of technical solutions for Smart Video:

**On-site Video:** Smart Video’s own player is displayed on the Smart Video customer’s own web site. Figure 1.1 shows an example of an on-site Smart Video.

**Native Video Ads:** The video from the Smart Video customer is not shown on their own web site but shown somewhere else, for example on an influencer’s\(^2\) web site. The video player looks like the on-site video (see Figure 1.1) but have more technical differences.

**Banner Video Ads:** The video player looks a lot like the on-site video (see Figure 1.1), with a few technical differences: it has a fixed size of 320x320px, it does not load a lot of data without interaction and not more than 1-2 product pictures from the start.

**Video Ads:** The Smart Video is shown as an advertisement in for example a commercial break in a series. The clickable and interactive slideshow is then displayed inside the video. Figure 1.2 shows an example of a Video Ad.

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1 Codemill: http://www.codemill.se

2 Influencer is person who has the power to influence many people, as through social media or traditional media.
1.1. Smart Video

Figure 1.1: Printscreen of an on-site Smart Video.

Figure 1.2: Printscreen of a Video Ad from Smart Video.
1.2 Problem Statement

To create a Smart Video today, someone from the Smart Video team at Codemill logs on to the application and creates it for their clients, but in the future, the clients should be able to do this by themselves if they want to. The first thing that the clients then should see when they log on to their account is an introduction movie on how to create a Smart Video, and when they have made a few videos, the introduction movie should be replaced by statistics and information about their Smart Videos. This is done in order to let the client view the statistics whenever they want to, and to relieve workload for the Smart Video team.

To get the statistics from the different video ads today, a sales manager at Codemill creates a document with information about the Smart Video and a pdf-file from Google Analytics (an online analytic tool). This is then sent by email or as a report to the client, which can be different types of people in the media and fashion industry, as for example sales managers, marketing managers, and project managers.

The presentation of the information and statistics in the clients’ account are going to be presented through a dashboard to get a quick and easy overview of the result from the video (see section 2.2).

1.2.1 Objectives

The purpose of this thesis was to find out how the most important information could be found and shown for Smart Video evaluation, with focus on the process, and to relieve the workload for the Codemill staff by removing an intermediary and replacing it with a digital solution. The goal was to present an interactive prototype of a dashboard that shows important and relevant information for the clients. The dashboard should follow the aesthetics of smartvideo.io, be adaptable to different screen sizes, be able to be handled by people with moderate computer skills, and be realizable with the technology that is available right now. The dashboard was developed with the use of the UX design process (see chapter 4) and other frameworks and tools (see chapter 3).

The research questions were:

- What type of information is important and relevant for the client to know about the Smart Videos that have been created?
- What other type of information is important to show?
- What kind of information is available?
- In what ways can the information be displayed?
1.3 Related work

Edward R. Tufte has been working on how to display information since the 1980s. His classic concept from 1983 of the data-ink ratio describes that tables and graphs consists of two types of ink: data ink and non-data ink, and the data that is being displayed should have high ink ratio [28]. This means that the ink that is used to display anything that is not data should be reduced to a minimum. He also writes about avoiding chartjunk, i.e. irrelevant text, lines, pictures and other decorations and ornaments that is not part of the graph or data that is being presented [28]. Tufte also defined the sparkline, which is a data-line often used to show a path, as an intense, simple, and word-sized graphic [29]. Sparklines ~ are often used in dashboards [12] (see subsection 2.1.2 for more).

In the middle of the 80s, William S. Cleveland and Robert McGill wrote articles on graphical perception and graphical methods for analyzing data [6], and also guidelines for how to construct graphs [5], i.e. data visualization. Stephen Few, who is inspired by them, followed that up by writing about what type of graphs that work best for the most common visualizations [11].

There were a lot of data visualizations that started in the 1980s, but the data visualization that we know as dashboards were first called Executive Information Systems (EISs). They later changed the name to dashboard. There were a few definitions of what a dashboard is but they all were a little unclear in their description [12]. According to Richard Brath and Michael Peters, dashboards and visualization are cognitive tools that improve our span of control over a lot of data and that they help people visually understand patterns and anomalies [2].

While Edward Tufte and William Cleveland are pioneers in data visualization, Stephen Few focuses on how to display communication in the best way. In 2004, a definition of what a dashboard is, was defined by Stephen Few [10]. He has also written two books on how to design dashboards, the first in 2006 [9] and the second in 2013 [12].

In 2015, Juice Analytics made a report on how to design dashboards. The report bases its information on the research made by Stephen Few and Edward Tufte but focuses on making the design more appealing [1].

1.4 Limitations

The biggest limitation was that this work had a time limit of 20 weeks. The design is limited to the design of the aesthetics of smartvideo.io. There are some future investigations that needs to be done before implementing the design suggestion, and even though one requirement was that the solution should
be adaptable to different screen sizes, the focus for the design was a desktop layout.

1.5 Thesis Outline

Chapter 1 - Introduction Contains an introduction to the thesis with a problem statement, objectives, related work on the subject, and limitations.

Chapter 2 - Background Contains the background on information visualization and dashboards.

Chapter 3 - Frameworks and Tools Describes the frameworks and tools that has been used in this thesis.

Chapter 4 - Methodology Contains the methodology for the research, design, and evaluation phases.

Chapter 5 - Results Contains the results from the research, design and evaluation phases.

Chapter 6 - Discussion Contains a discussion for this thesis on the work, design choices, limitations, and results.

Chapter 7 - Conclusion Describes the conclusion for the thesis and suggestions for future work.

Chapter 8 - Acknowledgements
Chapter 2

Background

This chapter focuses on the background of information visualization, how to present different types of information, and the concept of dashboards, to get a better idea of what it is and how to develop one.

2.1 Information visualization

Over the last few decades, computing and the internet have revolutionized the ability to create, store, and retrieve information. An important tool to make sense of the huge amount of data is information visualization. Information visualization is the process of representing complex data in a visual way so that a user can better understand it, see relationships (if they exist), and analyze it [25]. The goal with information visualization is to amplify human cognition, enabling users to see patterns, trends, and anomalies in the visualization and gain insights [23]. A common example of information visualization are dashboards. By showing the data as an overview and relevant connections, users can draw conclusions and insights from abstract data efficiently and effectively. It is also becoming increasingly interactive, which allows users to manipulate the visualizations and allow them to view topics from different perspectives until they reach the desired insights [25].

When the process of creating information visualization starts, it is usually with understanding the needs of the target user group. This could be done by qualitative research (e.g. interviews with the target users), which can reveal how, when and where the visualization will be used. To help with the visualization, there are visual elements that need to be created, for example maps and graphs along with labels, color, and contrast. [25]
2.1. Information visualization

2.1.1 Gestalt principles of visual perception

To display data in an effective way, we must understand a little about visual perception. We use perception to help us make sense of the confusing stimuli that is perceived in the world. One way to bring order and coherence into our perception is our ability to group things that are similar, and by doing this we reduce the number of things that needs to be processed [26].

To understand how we perceive groups of objects or parts of objects to form essential wholes, the gestalt laws were formulated. The overarching law is the law of Pragnanz which means that we perceive what we see in a way that organizes the different elements into a stable and coherent form [26]. In Figure 2.1 there is a visual understanding for the following gestalt principles, that all supports the overarching law of Pragnanz [26]:

a) Figure-ground: When perceiving a visual field, some objects/figures stand out and some fade into the background. In Figure 2.1, there are two pictures in a) that are the same with the exception of which parts are colored purple and grey. The objects that can be seen in each are a vase and two people facing each other. The two different objects, vase and people, can never be perceived at the same time in the same figure but the one that has the lighter color is almost always the one that is perceived first.

b) Proximity: When perceiving a variety of objects, we tend to see objects that are close to each other as forming a group, see b) in Figure 2.1.

c) Similarity: We tend to group objects on the basis of their similarity. In Figure 2.1 c), we tend to see four columns of Os’ and Xs’ instead of rows with alternating letters.
2.1. Information visualization

d) **Continuity**: When perceiving disrupted or discontinuous forms we tend to see them as smoothly flowing or continuous ones. In Figure 2.1 d), we rather perceive the symbol as two smooth curves than as two disjointed curves.

e) **Closure**: When we perceive objects that are not complete, we tend to close them up to create a hole. In Figure 2.1 e) there are two figures that we perceive as a triangle and a circle even though they are only parts of those forms.

f) **Symmetry**: We tend to perceive objects as forming mirror images around their center. In Figure 2.1 f), there are a series of brackets that we see as four sets instead of eight individual items, because we integrate the symmetrical elements into coherent objects.

2.1.2 Graph types

One of the most common ways of visualizing data is through graphs, and there are multiple types of graphs in the world, but not all of them suit dashboards. The following graph types belong in a dashboard according to Stephen Few [12]:

- Bar Graphs
- Bullet Graphs
- Dot Plots
- Line Graphs
- Sparklines
- Box Plots
- Scatter Plots
- Spatial Maps
- Heat Maps
- Tree Maps

Sometimes tables are a better option than a graph, for example when the visualization is used to look up or compare individual values, when the data has to be precise, when multiple units of measure must be included, and when the visualization has to show both details and their sums. [11]

Some graphs should be avoided when designing a dashboard because they communicate less effectively than the alternatives and some are too complex for a dashboard. This includes area graphs, radar graphs, funnel graphs, and the popular pie-chart. [12]
2.1. Information visualization

All of the graphs that suit a dashboard do not specifically suit a dashboard for marketing. The most interesting graph types for this thesis follows, with a description on why and when they are suitable to use.

Figure 2.2: An example of a bar graph made in Microsoft Excel.

Bar Graphs

Bar graphs were created to display multiple instances of a measure and refers to all graphs that use bars to present quantitative data. The bars can have different orientations, vertical, horizontal or stacked, and they should begin at zero, because otherwise the differences become exaggerated (see Figure 2.2 for an example). They are great for displaying measures that are associated with for example items in a category, multiple regions or departments, but also ordinal scales as "small, medium, large" or "A, B, C". It is easy to compare individual values in a bar graph by simply comparing the heights or lengths of the different bars. They are also good at representing parts of a whole and should be used instead of pie charts, because the data is presented more clearly in a bar chart as long as the graphs indicate that they are parts of a whole (e.g. in the title or with labels). Stacked bar graphs are only good to use when representing multiple parts of a whole. [12]

Bullet Graphs

Bullet graphs were invented 2005 by Stephen Few and is a simple substitute for gauges, which were synonymous with dashboards before, and still are for some. Gauges typically display a single key measure, has a target, have labels that declare the measure's state (good, bad), and they have different shapes.
2.1. Information visualization

and design (circular, linear). The problem is that they take a lot of space on a dashboard and cannot be lined up in a compact manner. A bullet graph is a redesign of a linear gauge and take little space (see Figure 2.3). It consist of a bar graph with a single bar, has an additional mark for a quantitative comparison, and shades of color in the background to indicate good or bad. It is used when there is a target for a specific measure, and the viewer wants a graphical representation of how far away from the target the measure is. [12]

![Bullet Graph](image1.png)

Figure 2.3: An example of a bullet graph made in Microsoft Excel.

**Line Graphs**

Line graphs are a series of values that show an overall shape by connecting the individual values. The connecting lines give a sense of continuity throughout the entire series (see Figure 2.4). This type of connections are appropriate only along an interval scale, and not along a nominal (e.g. categories) or ordinal (e.g. small, medium, large) scale. Line graphs are especially useful for showing the shape of change through time. In dashboards, line graphs are often used to present a quick overview of a time series. The Line graph does not have to begin at zero, unlike the bar graph. [12]

![Line Graph](image2.png)

Figure 2.4: An example of a line graph made in Microsoft Excel.
2.1. Information visualization

Sparklines

Sparklines were created by Edward R. Tufte and he describes them as "data-intense, design-simple, word-size graphics" (see Figure 2.5 for an example). Sparklines do not have the precision of a line graph and that is the intention, they are small. The whole purpose of a sparkline is to provide a quick overview and a sense of historical context, to show an overall shape. They are often embedded in text and tables which provide helpful context, and are often used for financial and economic data. [29]

Heat Maps

A heat map is when quantitative values are represented and displayed as variation in color. One common use is in the form of geographic displays where the color represents temperatures, or amounts of rain or snow that has fallen. Another example of a heat map is shown in Figure 2.6, where the number of visitors on a web site, and where they come from, are represented. The variation in color is usually one color and the intensity often represent more. It may not be very precise but gives a quick overview, and color-coded objects are good in a limited place, as it is in a dashboard. [12]
2.2 Dashboard

"A dashboard is a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance."

– Stephen Few [10]

One of the definitions of what a dashboard is, comes from Stephen Few [10] (see quote above). What he means by the definition is that the information on a dashboard is presented visually, usually as a combination of text and graphics. The information that is displayed on the dashboard serves a purpose and is often needed by anyone that has objectives to meet. The information should also appear on a single screen, so that all of the information can be seen at once. There should not be any scrolling or change of screen (then it is multiple dashboards). The dashboard should provide an overview and should be quick to point out if something is in need of attention, but it does not need to provide all of the details [12]. A small example of a dashboard is shown in Figure 2.7.

![Figure 2.6: An example of a heat map, taken from the statistics of my web site (katarinahagglund.se).](image)
2.2. Dashboard

Figure 2.7: Screenshot from a small dashboard that provides information about my web site.

2.2.1 Design guidelines

To create a good dashboard design, a good practice is to follow design guidelines. The design guidelines that were followed in this thesis are the ones proposed by Stephen Few, and they are as follows [12]:

Organize information to support meaning and use: This include organizing the information in groups according to activities, entities and use, define groups with little visual means, support meaningful comparisons and discourage meaningless comparisons.

Maintain consistency to enable quick and accurate interpretation: The same display for the same type of information. A small difference between them should have meaning. The layout and charts should not change from day to day.

Put supplementary information within reach: The dashboard should provide an initial overview, and if the user wants to, additional information and details. This could be done through pop-up windows invoked by hovering, through temporarily altering states, or through access to a separate screen.

Make the experience aesthetically pleasing: The design should be relaxing, preparing the user for greater insight and response. The design should...
2.2. Dashboard

not compete with usability. This also includes choosing appropriate and meaningful colors, the use of high resolution text and images, aligning content, and the use of a readable font.

**Expose lower-level conditions:** Give some kind of indication in the design when there is something in the lower levels that needs attention.

**Prevent excessive alerts:** Do not allow the dashboard to create too many alerts, or they will be ignored. There should be a difference between signals and noise.

**Keep viewers in the loop:** Too much automation can make the user lose awareness and context.

**Accommodate real-time monitoring:** Think about how often the dashboard should be updated. Maybe the user wants to save a certain moment. This includes time-stamp alerts and provides a mean to temporarily halt updates.

These guidelines are meant for all types of dashboards. Different types of dashboards have different types of focus and relevance on these guidelines.

Another thing to keep in mind is that humans that read pages from left to right and top to bottom, scan a screen in the same way. This means that there are different degrees of visual importance that are associated with different regions of a dashboard (see Figure 2.8). [12]

![Figure 2.8: Different areas of importance on a dashboard (adapted from [12]).](image)

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[12] Reference to the source where the table or diagram is taken from.
Chapter 3

Frameworks and Tools

This chapter introduces and explains the different frameworks and tools that have been used during the different parts of this thesis. Why these are chosen, are explained in Chapter 4.

3.1 Semi-structured interviews

Semi-structured interviews are one of four types of interviewing techniques, where the other types are: unstructured, structured, and group interviews [13]. Semi-structured are a combination of unstructured interviews, where the questions are more exploratory and more like conversations, and structured interviews, where there are predetermined questions similar to those in a questionnaire. Semi-structured interviews have both closed and open questions and the interviewer has a basic script for guidance to make sure that the same topics are covered within each interview [23].

3.2 Design

There are things to consider when creating a design. First to have an idea, choose the best suited design for the idea, and make the correct design decisions. The following tools are meant to help with this.

3.2.1 Usability guidelines

One thing that is good to know when designing something that others are going to use, is how useful it really is. If it is not useful, people would not want to use
3.2. Design

To assess if something is useful there are two quality attributes: utility and usability. Utility refers to the functionality of the design and if it does what the users need. Usability refers to how easy and pleasant the design is to use, and is defined by 5 components [21]:

**Learnability:** How easy is it for a user to use the design and perform basic tasks the first time they experience the design?

**Efficiency:** How quickly can users perform tasks once they have learned the design?

**Memorability:** How easy is it for users to resume to the same skill level when they have been away from the design for some time?

**Errors:** How many errors, how severe are these errors, and how easy can the users recover from them.

**Satisfaction:** How pleasant the design is to use.

3.2.2 Design rationale & QOC

Design rationale is documentation and analysis of designs. It reasons about and describes the features of a design, the intended and possible use for it, the pros and cons, and the weighing of tradeoffs. In a design process, this might be critical and useful to customers, users, service providers, and marketers, as well as designers [4]. Design rationale is one type of documentation that often is recorded informally. If it is recorded at all then there are information about why a certain design decision was made, and sometimes why some decisions were not made [3].

There are different types of design rationales: argumentation, history-, device-, process-, and active document-based. The argumentation based rationale are mostly used to represent arguments that define a design, and these arguments consist of problems that occurred, what alternatives there were to the problems, and the pros and cons for each alternative [3]. This rationale was the one being used in this paper.

To identify and analyze all possible design choices within a design that represents design rationale, the analysis uses a semiformal notation called QOC (Questions, Options, Criteria). Questions are used to identify the key design issues, Options provide the possible answers to the questions, and Criteria are used for assessing and comparing the options [20]. In Figure 3.1, there is an example of a QOC.
3.3 Prototyping

A prototype is an initial model that is meant to test the design of an object or software [14, 23]. Prototypes are used in design and engineering to improve items and processes before implementing them on a larger scale. It is also a vital part of the design process because it allows designers and stakeholders to see the product in action [14]. Prototypes are useful when discussing or evaluating ideas with stakeholders and an effective way for designers to explore design ideas. It allows stakeholders to interact with it and to explore its suitability [23].

A prototype can be anything from a paper-based storyboard\(^1\) to a complex piece of software, from a cardboard mockup\(^2\) to a molded or pressed piece of metal. It can be anything from a 3D model, a software or something that is printed out. [23]

3.3.1 Low-fidelity

Low-fidelity prototypes do not look or feel very much like the final product and do not offer the same functionality. They are generally paper based and include storyboarding, sketches, and mockups. They can be created by hand with a pen and paper or through a drawing program. These prototypes are useful in the beginning of the design phase to illustrate ideas, layouts, and design alternatives, but they provide limited details. The greatest advantages of low-fidelity prototypes are that they are simple, cheap, fast to produce, and can easily be changed. [27, 23, 15]

---

\(^1\)A storyboard is a series of sketches showing how a user might work through the product.

\(^2\)A mockup is close to the final product, but lacks elements of interaction.
3.3.2 Medium-fidelity

Medium-fidelity prototypes contain more details than low-fidelity prototypes and have most of the real content and some simulated functionality [8]. Medium-fidelity prototypes are click-through prototypes. They have some active links or buttons that allows the user to go through screens by clicking, but they usually do not have more functionality than that. The click-through prototype can be made with wireframes, a visualization of the structure of, for example, a website, by adding links that respond to simple ways of clicking, such as moving to the next screen [15].

3.3.3 High-fidelity

High-fidelity prototypes look and feel like the final product and offer more functionality than a low-fidelity, or a medium-fidelity prototype. They are software-based and provide a functional version of the system that the user can interact with. The disadvantage is that they are more time-consuming to produce and cannot be as easily changed compared to low- or medium-fidelity prototypes. [27, 23, 15]

3.4 Usability testing

Usability tests have a lot of different purposes; one is evaluation. An obvious benefit with usability testing is to figure out how to best address user needs, by identifying design elements that do or do not work [19]. Usability testing is usually conducted in a controlled environment with little or no disturbance. The goal is to test if the product that is being developed is usable by the intended user population to achieve the tasks for which it was designed [23].

To collect data, there are a number of methods that can be used and combined, for example video recording (including facial expressions), keystrokes, and mouse movements. Sometimes questionnaires are used to find out what users think about the product. Structured or semi-structured interviews can also be used to get additional information and to collect qualitative data, and sometimes the test person is asked to think aloud (see subsection 3.4.2) while carrying out tasks. To get quantitative data there are things that can be measured, for example time to complete tasks and number of errors for that task. Example of tasks can be to search for information and/or navigate. [23]

3.4.1 Guerrilla usability testing

Guerrilla usability testing is an easy-to-perform technique for refining the user experience. It is cheap, fast, and comes in many different forms [24]. Guerrilla
3.4. Usability testing

usability testing is a lean and agile approach to testing and consist of 7 simple steps: making a list of important tasks, prioritizing them, making scenarios, combining the scenarios, testing, capturing the insights, and fixing the usability problems. The tests are short, they measure the number of problems on tasks in the scenarios, and they have about three to five participants. There is no need to know who is being tested, because the goal is not to find all problems and do a big analysis, but to find and fix the biggest and most severe usability problems [22].

3.4.2 Think aloud

The think aloud technique is a useful way of understanding the user, because a problem while observing is that the observer does not know what the users are thinking. Observing should not be intrusive and the user should not be disturbed so the questions for the user is limited. However, an observer can be a little more intrusive in a controlled environment. The think aloud technique requires people to say out loud everything they are thinking and trying to do. If this technique is used with usability testing, the data is often collected with the help of recordings. [23]
Chapter 4

Methodology

There are many different methods, processes, and adaptions that could be used when developing a design suggestion. In this thesis, an adaption of the User Experience (UX) lifecycle, called “the Wheel” [15], has been used to develop the suggestions for the dashboard, because it is a well-used, established and proven process for UX-designers[15]. The Wheel consists of four different phases: analyze, design, prototype and evaluation (see Figure 4.1). This wheel is an iterative process that can go many laps until the final design is developed. The different phases in more detail are as follows [15]:

In the analyze phase, the understanding of user work and needs are analyzed, but to be able to do that, some research and compiling of requirements must have been done before entering the Wheel. During the analysis, the requirements that have been chosen often help to determine the product’s features, the look, the feel, and behavior of the interaction design.

In the design phase, a conceptual design is created and the interaction behavior is determined, which includes the look and feel, and the redesign for the next version. During this phase, ideation, creative design thinking, brainstorming, and sketching is done. Designing storyboards and physical mockups can also occur during this phase.

The prototype phase is often done in parallel with the design, and during this phase various kinds of prototypes are produced. They can be made at different levels of fidelity, including low-fidelity, medium-fidelity, and high-fidelity.

In the evaluation phase, the design/prototype is evaluated to see if the design is on track to meet user needs and requirements. The purpose is to refine the interaction design.
4.1 Research & Analyze phase

The research was made during the first seven weeks of this work, and can be seen in the first three chapters of this report. The research also included looking into the available information that exists for a Smart Video, which can be seen in Table 5.1.

After the background information was acquired, interviews was held with three clients of Smart Video, to get data about what the clients think is important and relevant information for the dashboard. Information about the clients that participated in the interviews can be seen in Table 4.1. An interview was also held with the sales manager at Codemill, who handles this type of information right now. He knows what the clients ask for, has a lot of experience with Smart Video, and knows what type of data that is being collected and sent as reports.

The interviews with the clients were semi-structured (see section 3.1), because of the clients different job titles and sizes of their companies, which required different follow-up questions, and because of the need for both open questions and predetermined questions to get the interviews less strict. The questions were the same for the sales manager at Codemill, but fewer and formulated differently. The protocol for the interviews, in Swedish, can be seen in Appendix A. The interviews were conducted in different ways depending on where the clients were located and what they were comfortable with. The interviews were recorded so that the focus was on the conversation instead of taking notes.
Table 4.1: Information about the clients that participated in the interviews.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Job title</th>
<th>Work tasks</th>
<th>Interview medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man</td>
<td>Operative partner</td>
<td>Sales, Structure,</td>
<td>Face to face</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Economy</td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>CEO</td>
<td>Sales, Economy</td>
<td>Phone</td>
</tr>
<tr>
<td>Woman</td>
<td>Marketing Controller</td>
<td>Coordinating</td>
<td>Phone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>campaigns</td>
<td></td>
</tr>
</tbody>
</table>

After the interviews were conducted, they were analyzed and compiled into a table. The most interesting findings, together with the information that is now being sent by email to the clients and the available data from the videos (see section 5.1), were the base for the design and prototype phases.

### 4.2 Design & Prototype phases

The design and prototype phases were carried out three times during this work. Below is the methodologies for each time.

#### 4.2.1 Low-fidelity

The design phase started with sketches of different options of visual representations for each cell in the compiled table from the interviews (see Table 5.2). The visual presentations for some information was easily chosen, while others had multiple options. To choose the right option for the visualization, design rationale with QOC (see subsection 3.2.2) was used, because to choose between options with the help of the criteria makes the design choices, and arguments, easier and clearer. Some of the options could also be combined or grouped, to show multiple pieces of information in one solution, which made the number of visualizations fewer.

The next step was to sketch different layouts for the dashboard, with the different visualizations and the different areas of importance (see Figure 2.8) in mind. A lot of different layout solutions were created and with the help of design rationale and QOC, one layout was chosen.

The next step was to create low-fidelity prototypes (see subsection 3.3.1), first with sketches, and then with Balsamiq\(^1\), a tool to make low-fidelity prototypes and wireframes. To make these prototypes, the whole interaction flow had to be considered, from how the users entered the dashboard to different options that could be made outside the dashboard. These were then evaluated.

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\(^1\)Balsamiq web site: https://balsamiq.com/
After the evaluation, some changes were made to the low-fidelity prototype, and then the process of creating the medium-fidelity prototypes (see subsection 3.3.2) started.

### 4.2.2 Medium-fidelity

The design phase for the medium-fidelity prototype started with research of the current style of the web application for Smart Video, and the corresponding web site: smartvideo.io. The findings included a lot of useful information about the typography, symbols, colors, and general style guides for components that should be used when creating prototypes for Smart Video. All of the existing styles were made in Sketch\(^2\), a digital design toolkit where both early ideas and prototypes can be created, which meant that, in order to save time, Sketch was chosen as the tool to make the medium-fidelity prototype. The color scheme from the style guides for Smart Video is showed in Figure 4.2.

The pages of the low-fidelity prototype, sketches of the dashboard, and the different style guides were the base for the medium-fidelity prototype when the prototype phase started. When new symbols and components had to be created, the existing styles had to be followed as much as possible, but were created by the author of this paper, instead of having the design team at Codemill create them.

Exploring the different options for the interactions that were missing in the low-fidelity prototype, and deciding which ones to focus on, was done by using design rationale and QOC. The finished prototype was then evaluated.

#### Color

![Color Scheme](https://example.com/color.png)

Figure 4.2: Color scheme from smartvideo.io.

### 4.2.3 High-fidelity

After the medium-fidelity evaluation, changes were made to the prototype before entering the high-fidelity design and prototype phases. The next step was to print out the different pages that were in the medium-fidelity prototype and mark where interactions should be added in the high-fidelity prototype.

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\(^2\)Sketch web site: [https://www.sketchapp.com/](https://www.sketchapp.com/)
To make the high-fidelity prototype (see subsection 3.3.3) as close to the real solution as possible, fake data for a year was created for two Smart Videos, and then the different graphs for the different stages (year, life, month, week, date interval, video completion for each, and comparison between the two videos for each) were created in Microsoft Excel.

There are a lot of different tools available to make high-fidelity prototypes, and after some research on how some of them work, Proto.io\textsuperscript{3} was chosen, because it had most of the interaction possibilities that were needed, and it worked as a plugin for Sketch, which meant that the work that was already put down into the medium-fidelity prototype could be kept. However, changes to the medium-fidelity still had to be made to fit the two Smart Videos that now had fake data, and there was also a need to make the file smaller so that Proto.io did not have to load unnecessary data.

Examples of interactions that were added to the high-fidelity prototype are dropdowns, scroll on components, checkboxes with actions, hover functionality, different states of pages and components, the use of other pages as overlays, and handling variables. One missing interaction was drag and drop, Proto.io had this functionality but it could not handle that other components were affected by a drop, so a work-around for this interaction had to be made. The finished prototype was then evaluated.

4.3 Evaluation phases

The evaluation phase was entered three times. The evaluation techniques that was used, when, and how they were used, are listed below.

4.3.1 Low-fidelity

The low-fidelity evaluation consisted of fast Guerrilla usability testing (see subsection 3.4.1) by four people, three from the Codemill office, and one friend. This test method was chosen because of the fast construction and fast results, and the fact that the low-fidelity prototype did not have that many components, and the purpose was to find the biggest interaction problems. Both the sketch of the dashboard and the Balsamiq prototype were involved in the test.

The test was constructed by making a list of tasks that could be performed by the low-fidelity prototype, prioritizing and grouping them to the different pages, and then making and combining scenarios. A paper with the tasks were then printed out. The tasks were similar to the tasks in Appendix B, but fewer, and the questions were more about the participants describing how they would complete one of the tasks instead of actually performing it.

\textsuperscript{3}An online high-fidelity tool. Proto.io web site: \url{www.proto.io}
The test itself was held in the lunchroom at Codemill, it was quiet and not much disturbance. The participants were using a computer to navigate the Balsamiq-prototype and used the sketch as a complement and understanding for more details of the dashboard. There were alternative solutions to some pages that the participants were asked about after the test. They got an explanation of what the differences were and could then give their opinions on which solution they preferred. The biggest interaction problems during each test were written down along with their preferable alternative solution. The notes were then used to alter the low-fidelity prototype.

4.3.2 Medium-fidelity

The evaluation of the medium-fidelity prototype was done with usability testing (see section 3.4), because the usability in the solution needed to be tested to see if changes had to be made, which is a benefit of usability testing. The tasks were constructed in the same way as the Guerrilla tests in the low-fidelity evaluation, but this time the usability was in focus so the tasks were shaped to fit the usability guidelines (see subsection 3.2.1). The tasks for the evaluation can be seen in Appendix B, in Swedish.

To test the different parts of usability, the following factors were considered:

**Learnability:** To test how easy it is to learn the first time, the participants were people that had not seen the solution before or been in contact with it in any way.

**Efficiency:** To test how quickly the participants could perform tasks once they have learned the design, two similar tasks were asked to be performed, with time apart.

**Memorability:** This part was not tested because it required the participants to be away from the design and then test it again after quite some time.

**Errors:** This was tested by counting how many tasks that could not be completed, and estimating how severe the errors were.

**Satisfaction:** The participants were asked about their opinions of the solution and the different parts of it. Their reactions to some of the parts of the design were also valued within this part.

The tests were conducted in a controlled environment, a small conference room at the Codemill office (see Figure 4.3), to have little or no disturbance. To control the tasks of the usability test and the flow, a pilot test was conducted. No changes were made after the pilot test, since there were no apparent problems.
4.3. Evaluation phases

Figure 4.3: A small conference room at the Codemill office.

Four people participated in the usability test, and they were all employees at the Codemill office. The participants were asked to think aloud (see subsection 3.4.2), and both sound and screen movements were recorded in order to see the problem areas more clearly and to be able to see what tasks took the longest.

4.3.3 High-fidelity

The evaluation of the high-fidelity was also done with usability testing, and was built upon the previous evaluation in subsection 4.3.2, this after discussing different options with a UX designer at the Codemill office. The purpose of the usability test was to test the new parts that were added to the high-fidelity prototype, so that the entire prototype was tested. Three completely new tasks were added to the high-fidelity usability test, two got new formulations, and one was removed (Question 6 in Appendix B, when the video was published), because the question was hard to grasp, and it was hard to picture what a solution for that question could be. The protocol for the high-fidelity usability test can be seen in Appendix C, in Swedish.

To check the formulation and ordering of the questions, a pilot test was conducted, which resulted in some small changes to the formulations of the questions. The tests were then conducted in a controlled environment. The participants were asked to think aloud, the screen and sound were recorded, and this time, the test included a computer screen and a mouse. There were six participants from the Codemill office that participated in the test, where one had participated in the medium-fidelity evaluation and therefore only received the new questions. One of the participants was the sales manager at Codemill.
Chapter 5

Results

This chapter presents the results from the different phases of this work, starting with the available data and interviews from the research phase, and continues with the different turns around "the Wheel".

5.1 Available data

During the research phase of this work, research was made about the data that is available from the Smart Videos that have been created and published. The data is saved into a database, but no data is being displayed at the moment, in any way. The data that is collected and available from the database is compiled into Table 5.1. The different types of data can be combined in many different ways to get different types of information, for example how many product-clicks one viewer made, how many unique viewers, how many times one viewer has watched the video, how many clicks a product has got from unique viewers, how many percent of the video ad the viewers have watched, and more.

5.2 Interviews

The results from the interviews, that were conducted during the research phase of this work, can be seen in Table 5.2. The different sections of the table show four different categories of findings: **Information, Answers, Functions, and Other**.

**Information:** The first section shows what type of information the clients were interested in knowing, i.e. what they wanted to find out by looking at the dashboard. This included for example where viewers drop off in the video
Table 5.1: The data that is available about a Smart Video.

<table>
<thead>
<tr>
<th>Location</th>
<th>The continent, country and city the viewer is watching from.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action</td>
<td>Different actions depending on what the viewer is doing.</td>
</tr>
<tr>
<td></td>
<td>This includes if the video was loaded, a product-click was</td>
</tr>
<tr>
<td></td>
<td>made (including the product URL), % of video completion,</td>
</tr>
<tr>
<td></td>
<td>when play and pause of the video happened, and if the Smart</td>
</tr>
<tr>
<td></td>
<td>Video was an ad that has been clicked.</td>
</tr>
<tr>
<td>Session</td>
<td>The browser session is saved to be able to group events.</td>
</tr>
<tr>
<td>Category</td>
<td>The video that is being loaded or watched.</td>
</tr>
<tr>
<td>Selection</td>
<td>If there are versions of the same video, with small</td>
</tr>
<tr>
<td></td>
<td>differences, an Artificial Intelligence (AI) makes a</td>
</tr>
<tr>
<td></td>
<td>selection of what video to show. The selection is the video</td>
</tr>
<tr>
<td></td>
<td>the AI chose.</td>
</tr>
<tr>
<td>Purchase</td>
<td>If a purchase is made from a video through a shopping cart,</td>
</tr>
<tr>
<td></td>
<td>the purchase is saved including the currency, the product</td>
</tr>
<tr>
<td></td>
<td>and the organization.</td>
</tr>
<tr>
<td>Created</td>
<td>When a certain event is being created.</td>
</tr>
</tbody>
</table>

and the most clicked product, however, there were four types of information that everyone that was interviewed thought were the most important: how many viewers and amount of clicks the video had, the CTR (click through rate, total numbers of product clicks per total views/impressions), and how many clicks each individual product had.

**Answers:** The second section shows what type of answers the clients wanted to have answered when they have seen the information on the dashboard. This included what people clicked on, if the investment was worth it, how much money they owe, and more.

**Functions:** The third section shows functions that the clients wanted in the dashboard. This included that it should be adaptable, have a timeline, and should be able to generate reports.

**Other:** The fourth section shows other requirements from the clients. This was for example that the dashboard should be able to give a quick overview, give relevant data, and be able to integrate with other dashboards. Many of these other requirements were technical solutions that were not part of the purpose of this paper, but they are valuable for Smart Video team, and the further development of the Smart Video product.
### Information

<table>
<thead>
<tr>
<th>How many viewers (unique &amp; total)</th>
<th>How many clicks (unique &amp; total)</th>
<th>CTR + goal + money spent</th>
<th>Video completion + how many people + when product clicked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where viewers drop off in the video</td>
<td>What products have been clicked + number of clicks</td>
<td>Device</td>
<td>Most clicked product + where in the video</td>
</tr>
<tr>
<td>Where the video was viewed from</td>
<td>How different videos in the same campaign are doing + compared + separately</td>
<td>Page loads for video</td>
<td>Compare different versions of the same video</td>
</tr>
<tr>
<td>Timeline for video + date interval</td>
<td>Clicks on different websites for the same video</td>
<td>Purchases</td>
<td>Average on clicked products per person</td>
</tr>
</tbody>
</table>

### Answers

<table>
<thead>
<tr>
<th>Where viewers drop off + why</th>
<th>If the investment is worth it</th>
<th>What people click on</th>
<th>How much money that should be invested</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many views that were generated</td>
<td>How my videos are doing</td>
<td>The CTR</td>
<td>How much they owe</td>
</tr>
<tr>
<td>What type of information that should be prioritized</td>
<td>If something is wrong, i.e. if a link is wrong</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Functions

<table>
<thead>
<tr>
<th>Customizable and adaptable</th>
<th>The information should be updated (IRL, hourly)</th>
<th>Should have a timeline</th>
<th>Make exportable PDF + able to send to email + set how often sent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does not have to be able to pause</td>
<td>Be able to watch details</td>
<td>Generate reports</td>
<td>Export option to, for example, Google Analytics</td>
</tr>
<tr>
<td>Could have different types of dashboards</td>
<td>Should be able to set date interval</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Other

<table>
<thead>
<tr>
<th>Simple and easy to use</th>
<th>Give relevant data</th>
<th>In English</th>
<th>Generate fast decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give a quick overview</td>
<td>Have an open API</td>
<td>Focus on computer layout</td>
<td></td>
</tr>
<tr>
<td>Be able to integrate with other dashboards</td>
<td>Information could be accessed from other applications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.3 Prototypes

The resulting sketches and prototypes from the prototype phase are presented in the following sections.

5.3.1 Low-fidelity

When the low fidelity sketches and prototypes were first made, the focus was on making visualizations, from Table 5.2, of the Information-section into a dashboard solution, and at the same time answer the Answers-section. The functionality in the Functions-section, and the Other-section, were to be kept in mind and trying to include as many as possible into the solution.

The first page that is seen when logged on to the Smart Video web application, is in this scenario the introduction video. To be able to view statistics on the videos that has been created, an item named Statistics has been added to the menu. When Statistics is clicked, a page that contains a list of active videos is shown (see Figure 5.1), and also accumulated numbers for all of them on page loads, video plays, product clicks, and purchases. To view details on a specific video, an item in the list has to be clicked. This action opens up a dashboard for that video, which can be seen in Figure 5.2. This prototype lacked details and were therefore complemented with a sketch (see Figure 5.3) that included more details on some of the components.

The low-fidelity prototype of the dashboard included solutions for different components from the Information-section. The information about the page loads, video play, product clicks, and purchases can easily be displayed as pure numbers and include both total and unique viewers. The CTR, one of the most important pieces of information, if not the most important, according to the clients that participated in the interviews, has the biggest font size for the numbers, so that it can be easily seen. It also includes a small bullet graph to show the goal for the CTR, which is one of the purposes with bullet graphs (small and show goals). The prototype also includes a table for all products included in the video, including how many clicks and unique clicks each product had.

The sketch that was used in the evaluation combined with the Balsamiq prototype, can be seen in Figure 5.3. It included more details on some of the components, for example a table with active videos that the selected video can be compared against. This table includes the page loads, video plays, and product clicks for the video, but also a sparkline that displays the recent activity. The sketch also included more details on the timeline- and the video completion components, which both need space and include a lot of different types of information. These two components handle time and that makes the use of line graphs optimal. There is also a heat map to view where viewers were located. Some of the paper components included an action for when they were clicked, they could expand to show more details.
5.3. Prototypes

Figure 5.1: Low-fidelity prototype of a list with videos.

Figure 5.2: Low-fidelity prototype of the dashboard solution.
There were two functions in the Functions-section that involved that the solution should be able to generate reports or PDFs, have it sent to the clients e-mail and be able to decide how often it should be sent. This was included in the solution by the use of icons in the upper right corner of the dashboard (see Figure 5.2). By clicking the different icons, different modals opened up and included different settings for the different actions. The mail modal included the email, where the report or the reminder should be sent to, from what date, and how often it should repeat (see Figure 5.4). The export modal only included if the exported file should include all available data or only the dashboard settings (see Figure 5.5).

**Evaluation**

The low-fidelity prototype of the dashboard had two different solutions, the first was the option with the list of videos separated from the dashboard, and the second had the list of videos inside of the dashboard, as a table. The first solution was chosen by the participants of the test because the second lacked an option to be able to compare videos in a clear way, and because the list of videos gave one more way of getting statistics, the total for all of them.

The biggest problem area that was concluded after the evaluations were the settings-page (see Figure 5.6) that could be entered by clicking the settings-icon in the upper right corner of the dashboard. It had a list of which components that could be displayed, with various settings, a list where the choices could be prioritized, and a preview. There was a lot of confusing thoughts about the prioritizing and the layout. This page also had an alternative version, which did
5.3. Prototypes

Figure 5.4: Low-fidelity prototype of the mail modal.

Figure 5.5: Low-fidelity prototype of the "export to pdf" modal.
5.3. Prototypes

Figure 5.6: Low-fidelity prototype of the settings functionality.

not include a preview and had different sizes of the blocks inside the prioritizing list, but this was also problematic because of the prioritizing. So a new design was developed for that solution and included a layout where the user could place and replace the different components more easily without any prioritizing (see Figure 5.7).

5.3.2 Medium-fidelity

The first page of the medium-fidelity prototype is a simple suggestion for how the start page (see Figure 5.8) could look when the clients log on to the web application of Smart Video, and the introduction video is shown. This page is not a real solution for that page, but the prototype needed a start page. The only clickable object in this page is the menu item Statistics, which goes to the list of videos that have statistics (see Figure 5.9). This page includes a little more interaction since all of the list items are clickable, and the layout can be changed from "list" to "grid". From the low-fidelity prototype to the medium-fidelity prototype, a few things have been added, which includes a search field, an option to change the type of videos that can be listed, a date-picker for the numbers on the right side of the page, and a sparkline inside the list item to be able to see the latest activity.
5.3. Prototypes

Figure 5.7: Low-fidelity prototype of the settings functionality after changes.

Figure 5.8: Start page of the medium-fidelity prototype.
5.3. Prototypes

When an item in the list is clicked, the dashboard for that video is displayed (see Figure 5.10). The differences from the low-fidelity prototype is that the icons have moved from the right side to next to the video title, and that there is a digital visualization of the timeline, video completion, and the geographical map. The timeline component also includes a Life-timeline at the bottom of the component, a line graph that shows an overview of the viewing activity (video play) for the chosen video. It also has markers that indicate the time span that is being displayed at the moment. The video completion component shows how many viewers that have watched a certain percent of the video. It also includes where in the video the products were placed and where the highest concentration of clicks happened. The geographical map is displayed as a heat map, where the darker shading of the color indicates more video plays (see Figure 5.10).

All of the components are dependent on the date span. The date can be changed in different ways, either by clicking the fast buttons to easily change between week, month and year, or by changing the from- and to- date. This can be seen in the upper right corner of the dashboard (see Figure 5.10). The colors on the dashboard all follow the color scheme of Smart Video. Yellow is the only color that is repeated, and indicates time.

One design decision where a QOC was used, was to decide how more details should be presented on-click. The first option was to expand the component inside the dashboard to view all details, and the second was to get a modal view of the information. A table representation of the QOC can be seen in Table 5.3. They both had pros and cons, but since the second option had more pros, it...
was chosen with an added scroll-functionality to tables and lists, to be able to still get a little overview, and make the cons less severe. The resulted details of the click on the products table can be seen in Figure 5.11.

The settings-page can be seen in Figure 5.12. It includes blocks for the different visualizations of the components. Each block has a remove icon and a drag icon that indicate that they can be removed, or moved to a different place on the dashboard. Some items on the upper left of the dashboard are locked and cannot be removed, which is showed by a lock icon over those blocks. At the bottom there are checkbox items that show which components that are active and locked, active, and not active. If an item is removed, either by unchecking the checkbox or using the remove-icon, an empty area is revealed. This indicates that there is free space on that area of the dashboard. If a block cannot be moved to that area, they will not have the option to be moved into that space, which will be shown by having the area becoming red if the block is pressed. When a block can be moved into that space or a new item is added, by checking the checkbox, a green area is revealed (see Figure 5.13), which indicates a suitable or empty space for that component. If there is no more space for certain components, the checkboxes at the bottom, those it concerns, will no longer be active.

The two functions, send to mail and export to PDF, did not change much from the low-fidelity prototype, except the layout in the mail modal. They can be seen in Figures 5.14 and 5.15.
5.3. Prototypes

Table 5.3: QOC of the options for presenting more detailed information on the dashboard.

| Q: How should more details be presented on-click? | + Able to view other components at the same time to compare  
| O1: Expand the component | + Easy to view all of the information from a specific component  
| | - Could create unwanted actions and movements on the dashboard  
| | - Messy  
| O2: Get a modal view of the information | + Easy to view all of the information from a specific component  
| | + Clean  
| | + Little disturbance  
| | - Hard to compare against other components at the same time  
| | - Hard to remember details when information disappears by being hidden

Figure 5.11: Medium-fidelity prototype that shows more details on the products in the video.
5.3. Prototypes

Figure 5.12: Medium-fidelity prototype of the settings page.

Figure 5.13: Medium-fidelity prototype of the settings page with empty slot.
5.3. Prototypes

Figure 5.14: Medium-fidelity prototype of the "send to mail" modal.

Figure 5.15: Medium-fidelity prototype of the "export to pdf" modal.
5.3. Prototypes

Evaluation

The results from the evaluation were compiled into a table, which included all of the errors that each of the participants made, comments on the errors, and other comments on the solution. The errors, and comments on the errors, can be seen in Table 5.4. The numbers in the Error-column corresponds to the task number in Appendix B.

There were three problem areas that could be concluded from the errors of the tests: finding and understanding the function of the "Compare Table", finding and understanding the "life" section in the "timeline" component, and to make the numbers on the right side of the video list page easier to look at. Table 5.4 contains the results from all tests, including the pilot test, since no changes were made after. The other comments that were made regarding the solution, is summarized into the following statements:

- Good solution (3/5 of the participants)
- The settings page did not work in the way I thought it would at first.
- The sparklines on the video list page did not make sense (2/5 of the participants)
- Did not understand what "Reminder" meant in the mail modal.
- Missing information on the geographical map. What type of information is it based on?
- The dashboard was a little overwhelming, with a lot of information at a first glance.
- The numbers on the right side of the video list looked overwhelming, and I did not want to look at it. Maybe space inside the numbers would help.
- The CTR really stood out (3/5 of the participants)
- Maybe have a plus on the green space, in the settings page, to make it clearer.
- Maybe highlight the span on the life line, to make it stand out more (2/5 of the participants)
Table 5.4: Results from the usability tests on the medium-fidelity prototype

<table>
<thead>
<tr>
<th>Participant</th>
<th>Error(s)</th>
<th>Comments on error(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8. Compare table</td>
<td>Did not understand the question</td>
</tr>
<tr>
<td>B</td>
<td>6. Life graph</td>
<td>6. Problems with finding the Life section (had to show).</td>
</tr>
<tr>
<td></td>
<td>8. Compare table</td>
<td>8. Problems understanding the meaning of the question, when explained, found it.</td>
</tr>
<tr>
<td>C</td>
<td>8. Compare table</td>
<td>Problems with finding the compare table.</td>
</tr>
<tr>
<td>D</td>
<td>6. Life graph</td>
<td>6. Could not find Life section (had to show)</td>
</tr>
<tr>
<td></td>
<td>8. Compare table</td>
<td>8. Wanted to mark videos in the video list for comparison (could not find the component)</td>
</tr>
<tr>
<td></td>
<td>10. Clicks, all videos</td>
<td>10. Could not find it on the dashboard, would have added the numbers in the compare table</td>
</tr>
<tr>
<td>E</td>
<td>6. Life graph</td>
<td>Could not find Life section (had to show)</td>
</tr>
</tbody>
</table>
5.3. Prototypes

5.3.3 High-fidelity

The high-fidelity prototype looks like the medium-fidelity prototype with some changes to the content and added interactions. First, the changes that were added to the high-fidelity prototype from the medium-fidelity evaluations were: more air in the statistics on the right side of the list of active videos (see Figure 5.17), the life-timeline became more clear with a grey box that shows the timespan that is shown at present (see Figure 5.19), added a "help"-icon to explain the different options in the mail modal (see Figure 5.24), added a dropdown that indicates what is shown in the geographical map (see Figure 5.18), disabled checkbox options that are not available in the settings page (see Figure 5.26), and added a dropdown for sorting of videos in the video list (see Figure 5.16).

The first page of the solution remains the same in the high-fidelity prototype. Meanwhile, the video list page now has a search field that can take input, an example of how the date picker could look, a dropdown for sorting, and a grid layout (see Figures 5.16 and 5.17).

![High-fidelity prototype of some interactions on the video list page.](image)

Figure 5.16: High-fidelity prototype of some interactions on the video list page.

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1High-fidelity prototype of the dashboard solution can be accessed on (as of June 5, 2018): [http://katarinahagglund.se/proto.io_smartvideo_dashboard/frame.html](http://katarinahagglund.se/proto.io_smartvideo_dashboard/frame.html)
5.3. Prototypes

Figure 5.17: High-fidelity prototype of the grid layout.

Figure 5.18: High-fidelity prototype of the dashboard solution, with dropdowns.
5.3. Prototypes

The dashboard now has dropdowns for components that can display different types of data, for example the timeline component and the geographical map (see Figure 5.18). There is a hover function on the week timeline graph (see Figure 5.19), to show an example of a function that should exist in the real dashboard. The hover functionality should exist in both the timeline component and the video completion component, as well as when different videos are compared.

One new function to the dashboard is a hover functionality to the video completion component (see Figure 5.20). At the bottom there are markings for each product, and this is where the products have their entry point, and markings of where clicks have been made. If a product marking is hovered, it is highlighted in pink, and a small box with the product name is shown, as well as when the clicks for that product was made. This is indicated by some click markings also turning pink.

Another new function is a hover functionality on the geographical map (see Figure 5.21). Each country that has a burgundy color contains data, and if they are hovered, a small box is shown with the name of the country and the data it contains. If the map is clicked, a modal with a table is shown (see Figure 5.22). If a country in the table is clicked it should go into further details, as it does for Sweden in the prototype.

Figure 5.19: High-fidelity prototype of the dashboard solution, with hover functionality on graph.
Figure 5.20: High-fidelity prototype of the dashboard solution, with hover functionality on product in "Video Completion".

Figure 5.21: High-fidelity prototype of the dashboard solution, with hover functionality on map.
The function to be able to compare two, or more, videos is shown in the compare videos component (see Figure 5.23). If a non-active checkbox is activated, the timeline graph, the life graph, and the video completion graph include the chosen video to be able to compare. The video that is chosen appears in a light green color, which is not included in the Smart Video color scheme. This is because all suitable colors were already taken, and if a color is repeated it should have a connection, which was not the case here. However, the green color can easily be changed into a different color by the Smart Video team. The other components should also include a comparison with the other video, but this is not included in the solution.

The input field in the mail modal changed (see Figure 5.24), and the modal is now interactive. If the "help" icon, that was added, is clicked it opens up a dialog with information about what the different send options mean (see Figure 5.25).
5.3. Prototypes

Figure 5.23: High-fidelity prototype of the dashboard solution, with compare functionality activated.

Figure 5.24: High-fidelity prototype of the mail settings.
There are some changes to the settings page, there is no grey area but instead a lock on each of the locked components (see Figure 5.26). It also contains an example of how it could look when a component is not available, or that it cannot be added until another component is removed, because there is no space for it. One function that is missing for this solution for the dashboard setting is the possibility to drag and drop the component to change the placements. This is indicated but does not work in the prototype. Another function that does not work, is that when a checkbox is activated, a block should appear next to the mouse, that should be placed, and the other components should move along with where the block is placed. There should also be a possibility to change size of the different blocks on the dashboard to make room for the new block.
5.3. Prototypes

Evaluation

The results from the high-fidelity evaluation were compiled into a table, which included all of the errors that each of the participants did, comments on the errors, and other comments on the solution. The errors, and comments on the errors, can be seen in Table 5.5. The numbers in the Error-column corresponds to the task number in Appendix C. The pilot is not included in the evaluation result, since the person was biased and had seen the dashboard, and its components, before the pilot test. There was one problem area that could be detected, and that was to find the markings for products, in the "Video Completion" component, and hover over them to get more information about the products. The other comments that were made on the solution, is summarized into the following statements:

- Good solution (all of the participants)
- Nice looking (4/6 of the participants)
- I want to have something that shows all products as a complement to the hover in the "Video Completion" component.
- It was easy to see the "Compare videos" component.
- Maybe have a connection between the "Product table" and the markings
5.3. Prototypes

in "Video Completion". Maybe even have thumbnails beside the markings, of the products, which could be toggled.

• Maybe have a different formulation on "Life span", for example "Published" and "Now" on each side.

• I would like to drag the components to change layout.

• It is a little hard to see the difference between the colors in the graph when the comparison is on.

• It is a little hard to find a specific product in the "Video Completion" component.

• Maybe a hover (or other mapping) on the products in the product table would activate the markings in the "Video Completion" component.

• I liked the solution of the settings page.

One final change was made to the dashboard solution based on this evaluation, and that was a hover on the names in the product table. When a name was hovered in the table, the corresponding product markings and clicks in the video completion component was activated.
Table 5.5: Results from the usability tests on the high-fidelity prototype

<table>
<thead>
<tr>
<th>Participant</th>
<th>Error(s)</th>
<th>Comments on error(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>6. Find when a specific product is shown in video.</td>
<td>Where guided to ”Video Completion” component, and could then find it on his/her own.</td>
</tr>
<tr>
<td>C</td>
<td>6. Find when a specific product is shown in video.</td>
<td>Where guided to ”Video Completion” component, and could then find it on his/her own.</td>
</tr>
<tr>
<td>D</td>
<td>6. Find when a specific product is shown in video.</td>
<td>6. Wanted to watch the video. Got a small clue, that he/she was close to the solution.</td>
</tr>
<tr>
<td></td>
<td>10. Compare video</td>
<td>10. Wanted to drag the videos dashboard, would have added in the list over each other. Found it after a hint.</td>
</tr>
<tr>
<td>E</td>
<td>6. Find when a specific product is shown in video.</td>
<td>Where guided to ”Video Completion” component, and could then after a small hint find it.</td>
</tr>
<tr>
<td>F</td>
<td>6. Find when a specific product is shown in video.</td>
<td>Where guided to ”Video Completion” component, and could then after a small hint find it.</td>
</tr>
</tbody>
</table>
Chapter 6

Discussion

In the beginning of this thesis, the vision was to have a dashboard replace an introduction video the clients are shown when logging on to their accounts. This will probably not be possible without having the video list page as the first page, which is not optimal for the application, because a first page should be more of an overview. There were changes made to the flow on how the statistics should be presented, from a single dashboard, to a video list and then to a dashboard solution. Maybe a second dashboard solution as an overview could be investigated, or to have something else instead of a dashboard.

When the different designs and prototypes were constructed, the gestalt laws and the design guidelines from Stephen Few were always considered. For example, if something was meant as a group, the proximity was considered. The same applied to the choice of the color yellow for time. Similar units (similarity), like time, should have the same color. The choice of colors was limited to the color scheme of smartvideo.io, but the different style guides and symbols helped a lot with the development of the medium- and high-fidelity prototypes. The colors could switch places, but components that do have a connection or represent similar types of data should have the same color. If they do not, they should have different colors.

When it comes to the guidelines from Stephen Few, the information was organized to support meaning and use, for example by having the timeline component close to the buttons to change the date intervals. The dashboard should not change layout, or sizes on the components, from day to day, which means that the different components should not have different designs every time the clients log on to the dashboard. Supplementary information is a click, or a hover, away. The design is aesthetically pleasing, with the help of style guides and symbols that already existed, but also by not overusing color, the use of one single font style, and aligning content. The theory about chartjunk from 1983, by Edward Tufte, is still relevant and was considered by having a minimalistic
design, with nothing more than what is relevant on the dashboard. This helps the eyes to focus on the data that is important.

There were four research questions for this thesis. The first was to find out what type of information that is important and relevant for the client to know about the Smart Videos that have been created. This information was obtained by having interviews with three clients, and also the sales manager, of Smart Video. Two of the clients came from small companies with limited experience with Smart Video, and the third was a new client with no experience. However, they all had experience in similar fields and knew what the most important information was for them, and also other types of information and functions that they miss in other dashboard solutions, which was the second research question. The experience that the sales manager had was vital, both to compare with the clients answers but also to get information about what information earlier clients had requested. To only have interviewed three clients is a limitation. More clients would have given more information, but since they agreed on the most important information, the resulting dashboard would probably have been the same, even with more interviews.

After the interviews, the information in the resulting compiled table from the interviews was selected by the author of this thesis. Another person might have had a different opinion on what information is the most relevant, which could have affected the result of the final dashboard solution.

The third research question was to find out what kind of information that is available today. The available information that was found is stored in the database and changes every now and then. Information can be added since there are still possibilities and combinations that are yet to be discovered and explored. If changes happen there might be components that will be removed, added, or changed.

The fourth research question was about exploring different ways the information could be displayed. This was done by experimenting with different visualizations and graphs for the different components, and also by having multiple solutions for different parts on the design and prototypes that was created and evaluated. One difficult aspect on how the information could be displayed was the limitation that was set by the definition of dashboards by Stephen Few, namely that the dashboard should be monitored at a glance and should not have a scroll. This meant that the components were limited to the screen size, but also that not all of the components that the clients wanted, could fit on the dashboard, and that the most important information had to be selected. To solve this, and to let the user choose some of the components, the settings page was constructed, both to get an overview of which components existed and to get to choose which ones were important enough to display.

The different visualizations that were removed, on the design of components and layout, were often removed through the argumentation of design rationale. Some visualizations were removed because another visualization was obviously
better, this was the opinion of the author and the outcome might have been
different with another person. One example is the different layouts for the
solution. The different components might have more than one possible sizes
and those were not explored. Not all possible visualizations were discovered
either, in both components and layout for the final solution.

Some visualizations were not shown in the final solution, i.e. the suggestion
for a bar graph to visualize the different devices that are being used. The
geographical map, which is a heat map, is only a suggestion. There are widgets
that have other solutions for how the geographical map could work, and those
may be a better solution than what is presented in this work.

The focus was to get a design for a desktop layout, and when there are smaller
screens, the selection of the most important components will be harder to choose.
One suggestion for the mobile layout is to remove almost every component and
only show the most important information: how many viewers and amount of
clicks the video had, the CTR, and how many clicks each individual product
had. The layouts in between the mobile and the desktop sizes should therefore
be responsive and show more components the larger the screen gets.

On the final solution, compromises had to be done because of limitations to the
chosen tool for the high-fidelity prototype, and because of the time limitation.
This included, not to compare everything on the dashboard when a compari-
on was made, and not visualizing the drag and drop solution for the settings
page.

There were three different evaluations on the solution, which all have limitations.
For example, all of the participants had high computer skills. Some tests should
have been done on people with moderate computer skills as well, since it is not
clear that the users of the final solution will have high computer skills. Their
skill level might have affected the result of the solution, and might be harder to
understand than anticipated.

One limitation on the low-fidelity evaluation is that more guerrilla testing on
the different solutions should have been conducted, but since there were more
evaluations after, more solutions were tested during a later stage.

All of the parts that are included in the usability testing were not tested, that is
memorability. To test this, it is required that the final solution should be tested
over time, and for the users to be away from it for some time before using it
again. This should be tested in the future.
Chapter 7

Conclusion

The process that is used in this thesis for making a marketing dashboard resulted in a solution that can be developed further. It follows the aesthetics of smartvideo.io, and can be realizable with the technology that is available right now. The solution did not however meet all of the requirements. The expected user is a desktop user with moderate computer skills, but the solution has been tested on people with high computer skills, and it does not include solutions for all types of different screen sizes.

The research questions were all answered through different methods: interviews, research, or experimentations. The interviews contributed to the final solution by highlighting what information is important and relevant for the clients about the Smart Videos that have been created and published. Both the interviews and the research helped in finding out what other types of information that could be of interest for the clients (e.g. a video completion component with mappings to products and clicks), and information that is currently available about a published Smart Video. The work also investigated different ways the information could be displayed on a dashboard solution, through experimentations of different sketches, designs and prototypes.

7.1 Future work

On May 25, 2018, new regulations about how user data should be handled started, called GDPR\(^1\). In this solution there are some suggestion on how to show unique data. All data that is connected to a uniqueness of a person will most likely be removed from the databases of Smart Video and will therefore not be able to be displayed. This means that all data connected to unique data

\(^1\)Information on GDPR: https://www.eugdpr.org/, and in Swedish: https://www.datainspektionen.se/datakyddsreformen/
will be removed completely from the final solution and the design will therefore have to be changed.

Investigations about good and bad CTR for different types of videos, for example a video connected to an influencer, or a video ad, have to be done before being able to use the bullet graph in the solution. Otherwise, it should be removed.

Technical solutions, as mentioned in the objective, are not all completed. The only screen size that is currently supported is desktop. When smaller screens are used, such as tablet or mobile, some of the components on the dashboard should be removed and only the most important ones should be shown. Suggestions for these solutions have to be developed.

All of the expansions on the components of the final solution should be investigated on how they should be designed. For example, if the video completion component is clicked on, what should happen? Is there an expansion in form of a modal or not, and what type of information should be displayed? These are questions that has to be answered before the final solution can be realizable.
Chapter 8

Acknowledgements

First I would like to thank everyone at the Codemill office for participating in the different evaluations that were made in this work. A special thanks to my supervisor Erik Grönlund for his support and input in each part of this work. I also want to thank Kalle Prorok from Umeå University for providing constructive feedback on each phase of the report. Also a big thanks to Niclas Drugge and Daniel Sjöström for giving really good and constructive feedback during our peer-reviews. Finally I want to thank my family and friends for all support during this thesis.
Bibliography


Appendix A

Interview protocol

Jag heter alltså Katarina Hägglund och läser Civilingenjör Interaktion & Design vid Umeå Universitet, och jag gör mitt ex-jobb på Codemill där jag ska ta fram ett designförslag på en dashboard, som kommer innehålla information från de videos som skapats av Smart Video. Den här intervjun kommer alltså att hjälpa mig att se vad det är för information som ni vill ha och tycker är mest relevant.

Jag kommer att spela in det här samtalet, men det är endast för eget bruk, så att jag kan lyssna igenom svaren sedan och slipper anteckna. Jag hoppas att det är okej med dig?

- Vad jobbar du med?
- Vad är dina arbetsuppgifter?
- Vad har du för roll? Andra roller som du har haft?
- Vad har du för utbildning?
- Annan relevant bakgrund inom detta område?

- I vilken miljö brukar/kommer du granska informationen som du får idag?
- Hur mycket tid brukar du lägga på att granska informationen du får?
- Vad behöver du veta om en video?
- Vad behöver du få för svar genom en video?
- Vad ska du använda informationen från dashboarden till?
- Hur ofta kommer dashboarden att kallas?
- Hur ofta tycker du det är nödvändigt att informationen uppdaterar?
– Kommer ni att vilja pausa informationen som visas? Vill ni spara undan vissa ögonblick?

• Letar ni efter kopplingar eller relationer mellan vissa typer av data?

• Har ni några gränser för vad som är bra eller dåligt när det gäller en video?
  – Eller några andra gränser?

• Har ni några förväntade värden eller mål?
  – Några mål som ska/kan markeras?

• Kommer det vara flera kampanjer igång samtidigt?
  – Flera olika typer av filmer på samma kampanj?
  – Hur skulle du vilja att det hanterades?

• Är det någon information som ni måste veta på detaljnivå?

• Vad har du för erfarenhet av dashboards?

• Vad är din syn på dashboards?

• Skulle du vilja vara med och testa den design som jag kommer ta fram?

• Något du vill tillägga?
Appendix B

Usability test protocol, medium-fidelity


Prototypen är inte helt interaktiv, så allt går inte att klicka.

Uppgifter:

1. Du vill se hur en av dina videos har gått den senaste månaden
2. Du vill se vilken av produkterna som gick sämst
   (a) Avbryt (om modal använts)
3. Vad CTR:en är för videon
4. Byta video till en annan
5. Ändra utseendet/layouten på dashboarden
   (a) Du vill byta ut ”geographical map” mot ”device”
   (b) Ångrar dig och vill avbryta
6. Du vill veta när videon publicerades
7. Spara ner en PDF
   (a) Dashboard settings
(b) Ångrar dig och vill avbryta

8. Se alla videos som går att jämföra med den här videon (compare videos)
   (a) Avbryt (om modal använts)

9. Skicka statistiken till din mejl
   (a) PDF, varje vecka

10. Hur många produktklick som alla dina videos har tillsammans

Vad tycker du om designen? Något som verkar otydligt eller som du inte riktigt förstår?
Appendix C

Usability test protocol, high-fidelity


Du kommer att få ett antal uppgifter som du ska lösa och du får väldigt gärna prata högt om hur du tänker runt det du ser och gör.

Det du gör på skärmen kommer att spelas in, men det kommer bara att ses av mig och ingen annan för att jag ska slippa anteckna.

Prototypen är nästan helt interaktiv, så testa gärna att klicka på saker som du tycker verkar intressant.

Uppgifter:
1. Du vill se hur en av dina videos har gått den senaste månaden
2. Du vill se vilken av produktorna som gick sämst
   (a) Avbryt (om modal använts)
3. Vad CTR:en är för videon
4. Byta till en annan video
5. Du vill veta hur det har gått senaste veckan.
   (a) Hur många kollade den 26/3?
6. När visades Melltorp/Adde i videon? (den som toppar listan)
7. Ändra utseendet/layouten på dashboarden
(a) Du vill byta ut ”purchases” mot ”average click per person” eller ”billing amount”

(b) Ängrar dig och vill avbryta

8. Hur många ”video plays” från Stockholm har videon haft?

9. Spara ner en PDF

   (a) Du får välja vad du vill ha

10. Du vill göra en jämförelse med en annan video

11. Skicka statistiken till din mejl

   (a) Du får välja inställningar

12. Hur många produktklick har alla dina videos tillsammans?

Vad tycker du om designen? Något som verkar otydligt eller som du inte riktigt förstår?