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Aesthetics in User Interface Design: The Influence on Users' Preference, Decoding and Learning

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“Every design, however small, is a part of what can be seen as the largest design project of them all – the joint design of the world as a place for human life.”

Löwgren and Stolterman
Abstract:
The question of the relationship between, and the importance of usability and aesthetics, in the field of user interface design, has been debated back and forth. It has also been looked at from different perspectives since Raskin (1994) wrote his article on intuitive design. Several experiments have also been conducted over the last twenty years to find out exactly how much each factor matter, what the ultimate user preference is, and if it can be stereotyped. The more complex part of the discussion, however, seems to be the definitions: exactly what is aesthetics, what is usability and how do they affect each other? To find out, I explored the context of these factors from multiple perspectives, to draw the larger conclusions about what affects what. How accurate is the concept of halo when it comes to interface design; can a less aesthetic interface discourage users from exploring its content? Moreover, can a highly usable interface convince its users that the web page is also aesthetically pleasing?
In this paper I will explain the ideas of aesthetic and intuitive design based on two fields of study; human computer interaction design and interaction design. That is in the pursuance of understanding user preference and the design decisions behind one of the most popular interfaces on the internet today.

Keywords:
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Introduction

Two common key terms users apply when describing their perception of a desirable interface is "easy-to-use" and "intuitive". The issue with these terms is that they are both hard to define and to know how to achieve. (Blair-Early and Zender, 2008.) In order for an interface and its functions to be intuitive it has to allow the user to connect it to something s/he already seen and learnt how to use, i.e. it has to be "familiar" (Raskin, 1994). In consequence, if an interface has to resemble something that has already been done to be desirable for the users, will not the creativity suffer? (Raskin, 1994). It has been claimed that aesthetic design can affect user preference more than the traditional rules of usability, and the idea that beauty matters is well supported by other theories in both marketing and social psychology (De Angeli, Sutcliffe and Hartmann, 2006). In my paper, I will explore the topic of modern user interface design with a focus on the aesthetic aspect, based on two fields of study; human computer interaction design and interaction design. I aim to prove that the aesthetic factor in user interface design has a high impact on user preference as well as their decoding, understanding and learning of that interface. By exploring core ideas and user interface design guidelines, I hope to better understand user preference. I also aim to get a better understanding of the design decisions behind one of the most popular interfaces on the internet today, that I will analyze and explain at the end of this paper.
There are several ways of thinking when creating, designing or even analyzing an interface. One field within the area is human computer interaction, commonly referred to as HCI, that explores the interrelation between the human mind and computers. Johnson wrote in his book Designing with the mind in mind: Simple guide to understanding user interface design guidelines (2014) about this topic, with the human psychology in focus for a successful interface design. He thoroughly explains how our brains interprets objects as well as the patterns we see, and how that knowledge can be applied to the design work. The idea of design as a creative process, on the other hand, is highlighted in Stoltman and Löwgren's book Thoughtful Interaction Design (2007), where they argue that good design does not simply come from good methods and techniques, but from a good designer. A good designer, they continue, is a thoughtful designer that can reflect upon and analyze his/her own designs from both a personal, and a much broader perspective. Some methods are required for a thoughtful designer to be aware of, to be able to consider and to reflect upon, and both the concept of thoughtful design and methods are explored in their book accordingly.

Other authors who reflected upon the need for design guidelines are Blair-Early and Zender. They argue in their article User Interface Design Principles for Interaction Design (2008) about the need for design principles when creating an effective interface. They explain how ideas from human computer interaction can be bent towards interaction design, and suggests a set of flexible design principles from which designers can gain inspiration. De Angeli, Sutcliffe and Hartmann goes deeper into the question about user preference regarding usability and design in their article Interaction, Usability
and Aesthetics: What Influences Users' Preferences? (2006). In their article, they conduct an experiment with a group of users who gets to try one of two web pages with the same content but different interaction styles; one that is menu-based and one metaphor-based. Their results show that preference is depending on user experience, age and web page content and that the interaction style in return can influence users' perception of the information quality on the web page. The idea of user preference and perception of a web page is explored in Lee and Koubek's article Understanding user preferences based on usability and aesthetics before and after actual use (2010). They explore this topic by managing an experiment as well, but instead looking at how users react to their example web pages, created with different levels of aesthetics and usability (according to Gestalt principles and color theories). Their findings were that it is equally important to consider both factors, regardless of use, when it comes to user preference. My findings and ideas from this article, along with the information and concepts found in previously mentioned books and articles, created the foundation for this paper. Without them, I would not have had the knowledge nor inspiration to execute this final thesis project for my bachelor's degree.

**Interfaces: definition and decoding from a HCI-perspective**

Every single piece of technology we use; every app, web page and software on our smartphones and computers has an interface for us to interact with. Some we might consider to be easier to understand and more useful than others, and behind every single interface lies a set of decisions regarding the user interface design. In their
article, Blair-Early and Zender (2008) defines user interface "as the means by which users interact with content to accomplish some goal" (p.89). This explains that an interface basically is the intermediary between the user and the content, where the content adapts to what the user demands. Another way to describe the task of an user interface designer is to compare it to an architect's. Both of them has to follow certain rules in order to design a stable, fault-free foundation. Although, worth thinking about regarding their task is the quote that their work "does not replace the art in a design, it makes it possible" (Johnson, 2014, p. ix).

The human visual perception system

When we first encounter a new interface, our eyes scans the screen and sends the collected information on to our brains for decoding and the creation of meaning. This function can be called the visual perception system, and it decides not only what we actually see, but also what it means. Johnson (2014), explains that rule number one to bear in mind regarding our visual perception system is: we see what we want to see. Our brains wants to see and interpret what it expects to perceive from our surroundings, in order to be able to create structure and meaning from it, and does so according to three factors: our past experiences, our present and current surrounding and our future goals. With our experiences, our brains uses information we already have received regarding the object or scene we are looking at, and the context of which we look at it. As a result, many users of various interfaces clicks on buttons before really looking at them. The context of the display and the interface they are using gives their brains
enough information to know what the button is there for, all due to their past experience with previous applications, websites etc. This idea works backwards as well: if we are expecting to find e.g. a button, and it is placed in an unusual spot or designed differently, we might even oversee it. That is the reason why the design principle "place controls consistently", that tells designers to keep a logical placement of their function buttons in their interfaces, is a commonly quoted guideline. Our present and current surroundings such as where we are, what we hear, what we smell or what we see will also affect our visual perception. For example, if someone tells you that the clouds in the sky looks like an angry face your brain will automatically make your eyes search for the familiar features of a face, instead of itself interpreting the randomized shapes of the clouds above. This idea translates to how we use certain interfaces too, but with our future goals as the main inspiration for our perception. For example, if you are asked to look up the ticket price for a certain concert on a web page your brain and visual perception system will make your eyes scan the screen for numbers and the word "price". Therefore, when being asked afterwards when the concert starts or who the supporting act was, you most likely will not be able to answer. The reason for your lack of answer is not because you were being ignorant, but rather because you are human. We are programmed to focus our attention on what we consider important, and especially so when we have a future goal in mind (Johnson, 2014).

**The gestalt principles**

Why we see what we see, and why we interpret it the way we do could be due to the rules, or gestalt principles, that our brains follow in order to make sense for the visual
perception system. Johnson (2014) describes that according to a group of German psychologists, the human vision is holistic and, therefore, tries to find wholeness by creating structure in what we see. Johnson (2014) explains this further by explaining the so-called gestalt principles that together creates a set of useful user interface design guidelines. The first three gestalt principles are called proximity, similarity and common fate, and they explain how and why we see and consider certain objects as grouped. Proximity, first of all, regards the distance between objects and how that affects our visual perception system. If there is a group of objects, the ones that are close together, relative to the rest of the objects around them, will appear to us as they have a connection with each other and vice versa. Similarity can cause that same effect, where objects that look somewhat similar to each other by e.g. color, typeface or shape will appear as grouped, or not. The last gestalt principle regarding grouped objects is common fate; that concerns the motion of objects and how that affects how we perceive their relation to each other. The next set of principles is called continuity and closure. They state how our brains fill in the gaps of missing data in what we see, in order make things less complicated for us to understand. Continuity makes sure we see continuous forms, even when the forms or shapes cut into several pieces, like the water creature in figure 1.1 (A), or divided into two separate colors. Closure works in a similar way since it allows us to see a whole even in "broken" pieces that just consists of separate objects. Closure also allows us to see blank spaces as shapes. This concept is depicted in figure 1.1 (B) where a set of triangles automatically makes our visual perception system tell us that we see a round ball with spikes on it. The last two gestalt principles are symmetry and figure-ground, both of which states that we interpret what we see in a
simplified way by giving it symmetry and thereby reducing the complexity. E.g. The
principle of symmetry can, in print and graphics, make us see simple geometrical
shapes that are latched together as three-dimensional objects. This phenomenon is
closely related to figure-ground, the gestalt principle that by color, size and our attention
allows us to see objects in layers such as foreground (figure) and background (ground).
Naturally, an interface can not only depend on one gestalt principle, they work best
when combined. Therefore, it is important to consider all of them when designing a
good user interface since an unintended gestalt principle might cause confusion among
its users.

FIG. 1. (A) explaining the concept of continuity and (B) closure.
Types of users and the influence of content

Abstractly speaking, depending on goals and intention, authors Blair-Early and Zender (2008), explains that there are two types of personas to describe interface users: the hunter and the browser. The main behavior separating the two is their scanning behavior, especially when it comes to content regarding textual information. The hunter is driven by needs, knows what s/he is looking for and is completely focused on finding it. It is, therefore, rare that s/he leaves the initial path to discover new angles or content. The browser on the other hand is driven by wants and acts almost completely the opposite way, s/he does not know what the final destination is. Thus, that user is more likely to spend more time with the app/web page in question, and both notice and be driven by the actual interface around it. Again, these two personas are two extremes on opposite sides of a scale, and most of us are somewhere in between these two, or adapts one or the other depending on goal and situation.

Content-strategies

Depending on the intended target group's goals and whether they are more likely to be hunters or browsers, the content's natural structure can be adjusted by the interface design by using different strategies. Three common types of interface content-strategies, according to Blair-Early and Zender (2008), are linear, tree and matrix. A linear interface works well with scientific content since it is one where the designer controls how much and how fast users can reach the desired information. This structure is applied by letting the users reach pieces of information bit-by-bit, where each step of
the interface depends on the one before, and consequentially allowing users to reach their final destination progressively. The tree structure, on the other hand, is best applied to content using categories (parent/child). This allows users to take more control, depending on their interest, of what direction, or branch of information to follow. In a tree structure, the interface allows its user to go from a broad topic and be narrowed down to a more specific one by letting them choose between multiple options after each step. Therefore, this structure fits hunters very well, it allows its users to quickly access specific information with only a few steps. The matrix structure, on the contrary, is better suited for browsers. It presents many related options at each step of the interface at the same time, and thereby allows users to decide what they are looking for, as they are looking for it. (Blair-Early and Zender, 2008).

**Focus: interaction design**

To communicate is to interact, and that is where interaction design enters this paper. The field of interaction design is closely related to human computer interaction design in their way of enabling the communication between us humans and technology. However, the main difference lies in the focus of each study. Interaction design is about creating, shaping and deciding on qualities such as structure, function, ethics and aesthetics of the interface in which we interact. Moreover, human computer interaction design studies the human behavior in relation to computers in a more broad perspective. In the question of defining good design, Löwgren and Stolterman (2007) writes that they believe it depends on several factors. The first factor would be the situation behind the
creation of the design, it has to fit the needs of its users. It does not matter how fast or intelligent the designed interface is if its users can not understand it. The second factor is the situation's specific intentions and expectations, the already existing competence in the users who are judging it. For example, if the interface is designed for highly skilled users, with high customization of every function (let us say Photoshop as an example in contrast to MS paint), and the actual users will be beginners, the interface would be considered as too complicated, and, therefore, a bad design. Löwgren and Stolterman (2007) continues on the topic, and states that the word "good" also has to be defined in terms of societal laws, ideological considerations, environmental ideas etc., and that it is therefore impossible to reach a simple definition of "good design". In order to design in a good way is to continuously think of design in a thoughtfully reflective way by constantly questioning the quality of the design at every stage. Löwgren and Stolterman (2007) therefore argues that in order to be a good designer, one must become a thoughtful designer. With thoughtful they also mean reflective, and being able to truly understand and reflect upon design in terms of the process, product, ability and larger context in relation to it. Thoughtful designers should also be aware of themselves as a part of a larger culture that shapes the professional knowledge of design, and that their main products are knowledge, and not artifacts.

The design process

To better understand interaction design, it is important to understand its creation process. All interaction designers have to enter a unique process, called a design
process. To explain this process, Löwgren and Stolterman (2007) writes in their book about the topic. They begin with the statement that "to design is to create something new, this means that design work is impossible to predict. If the outcome can be predicted, it is by definition not a design process." (pg. 9). This explains the complexity of describing the process. But they also write how they will attempt to provide a useful theory, or rather a description, of a process that designers can follow in order to get at least a new perspective on how to plan, organize and evaluate their work. They highlight the importance of being a thoughtful designer, and to also look at their guidelines with a critical eye. The first step of the process starts before the actual process, they go on and is the moment where the designer first hears, or thinks, about the project. At this moment, all factors around the project, such as; the situation, the environment, and the past experiences are considered. Later, the background material, a problem statement and list of requirements forms the first image in the designer’s head. This image helps the designer to form an idea of the design of the design process, that decides to what extent, and how the project will focus on creative work, new technology, the client, analysis, specification and the people who will work with it. The image will also help the designer to create a view of the dilemma, not the problem since problems always have a satisfactory solution and dilemmas do not. Although, dilemmas are not as bad as they sound, thanks to them along, with the complexity of design, creativity becomes fundamental.

The actual design process begins with three parts: a vision, an operative image and a specification. The vision is created when the designer is first confronted with a design
project, and depending on how experienced the designer in question is, and how similar the project is to his/her earlier work, this vision will emerge earlier and be more detailed. A vision can emerge in many different shapes, as an idea about an infrastructure, a thought about a specific function or as an image of the style and look. When the designer has a clear vision of the design project, s/he can start sketching it down. The sketch is called an operative image, and is considered very important since it is a way of communicating the thoughts and ideas of the designer to the client. The operative image will most likely change back and forth along with the vision, but when it is considered to be adequately detailed, the designer can make a decision that it from now on will function as a specification for the final design. The next step in the process is called the construction process, and it is at this point that the production of the final product takes place, based on the previously created specification. The process as a whole might look like it is consistent and linear in writing, but in fact it is quite the opposite. The three first stages, vision, operative image and specification will constantly affect each other as well as the construction process (see fig. 3.1) (Löwgren and Stolterman, 2007).

![Diagram](image)

*FIG. 2., illustration of how the design process is anything but linear.*
A thoughtful process

The design process, as described, would not be considered a process thoughtful enough, unless a few more critically challenging steps affects the process. Löwgren and Stolterman (2007), argues that a thoughtful designer also have to be able to reflect, consider and to adapt some of the following ideas to their design process. Firstly, is the importance of questions. If asked in a correct way, questions can open up a new conversation and challenge the entire understanding of the existing design project and its context. By simply asking, "why?" the designer could make the client realize his/her's actual needs in contrast to wants, and possibly also change the relationship and trust between each other.

In design, it is not always true that the client or user knows best, and by questioning underlying reasons for the project, the designer could make the process more creative and innovative rather than just problem-solving. Thoughtful designers should also learn to work with multiple ideas simultaneously. By doing so, they can avoid getting stuck in a spiral that starts with one favorite idea that locks other potential solutions out. Therefore, it is also important for designers to always consider their limitations and to be open to other people's and colleagues' ideas. The next idea to consider to be a thoughtful designer is always to be able to visualize the final composition. This is where the present and the vision of the future has to combine to let the existing and not-yet-existing realities mold together into one digital artifact. The work of a designer is as well
a social process, where several people have to work together on different parts that will end up as one. This means that everyone involved needs to know what to do, with who and when, and that alone requires a certain skill of management. All stakeholders of the design project can divide into three subgroups, the core, the periphery and the context. At the core are people who are directly involved with the project, such as professional designers and the clients. At the periphery is where the users and clients who are not actively affecting the work at the design stage. The context group is where factors such as the surrounding environment and society are, along with other interest groups which does not actively participate the work, but still has an influence on it. Accordingly, Löwgren and Stolterman (2007) claims that a thoughtful designer has to know how to consider all three subgroups, and let them and their ideas co-exist with the vision and final design decisions.

User preference

In the term user interface design, the word ‘user’ comes first. All interfaces have to be designed for the purpose of being handled by a person, i.e., a user. Therefore, one key concept for any user interface designer to consider is the user preference. This is something that authors Lee and Koubek (2010) define in their article as: "A way of assessing a potential user’s intention to purchase or use a product or service is user preference, which directly reflects a user’s feeling and attitude for applications" (p. 530). They continue to their definition by explaining that users create their preference of these applications (computer programs, interfaces, software etc.) by measuring, comparing
and weighing the importance of different factors. Two of the most dominant factors are usability and aesthetics. Traditionally, good user interfaces have been explained in terms of guidelines and principles related to usability, with little consideration of the aesthetic aspects. However, since the first establishment of aesthetic guidelines, as an explicit marketing tool, its importance has increased rapidly (Lee and Koubek, 2010).

Usability is no longer the only factor for designing a satisfying interface. In their article, De Angeli, Sutcliffe and Hartmann (2006) argues that despite the importance of usability and the "look and feel" of the interface design can in some instances be considered even more important. One reason behind this, they continue, could be the concept of halo. The concept of the halo is well-known in fields of marketing, product design and social psychology and states that "beauty matters". Aesthetically pleasing package design sells more products, and people tend to correlate attractive individuals with positive personality attributes. The same effects could apply to interface design where an interface that is considered beautiful by its users might also be considered better, in terms of both usability and willingness to browse and explore.

Lee and Koubek (2010), created an experiment with nine hypotheses based on four interfaces, to test users' perception of aesthetics and usability as well as the preference, before and actual use. In total, there were four different interfaces (systems). System 1 had a low level of both usability and aesthetics, system 2 had a low level of usability but a high level of aesthetics, system 3 had a high usability level and low aesthetics level and finally system 4 had a high level of both factors. The aesthetic systems (2, 4) were
created with a layout following the principles of visual organization (proximity, alignment, consistency and contrast), with typefaces Georgia and Verdana (recommended by authors McCracken and Wolfe) and with the use of an analogous color scheme in yellow, orange and green, with a significant difference in brightness and saturation. The systems created with a high usability level (3, 4), on the other hand, were done so by organizing content items according to users' mental model by the help from ten potential users, as well as making sure the navigation structure was clear and related to the content. 73 students, undergraduates and graduates, were chosen as participants for the experiment based on two surveys regarding system experience and experience. To try their hypotheses, Lee and Koubek had the students perform three tasks individually on the interface they were given: (1) was to evaluate their preference and perception of aesthetics and usability before actual use, (2) was to complete four scenarios on the system and (3) was to evaluate user preference and perceived usability and aesthetics after actual use. Final results of Lee and Koubek's (2010) research showed that user preference before actual use was highly affected by the aesthetic factor, but not so much by the level of usability. Interestingly, results also turned out to agree with De Angeli, Sutcliffe and Hartmann's (2006) arguments about aesthetics. Results showed that before actual use, users who rated an interface as aesthetically pleasing also rated the perceived usability as high, and vice versa. A high level of perceived usability resulted in a high level of perceived aesthetics. User preference after actual use, on the other hand, was equally affected by both levels of aesthetics and usability. Overall, regardless of actual use, both the level of aesthetics and usability significantly affected the user preference.
The new aesthetics

Encyclopedia Britannica defines aesthetics in the context of art, as "the philosophical study of beauty and taste". The definition also explains that for aesthetics to exist there must be an object, recipient and an experience. Therefore, the aesthetic object must in some way communicate to its recipient, the spectator, in the form of emotions. However, the definition does not distinguish between what would be considered aesthetically pleasing or displeasing, more than that the aesthetic object should in some way evoke enjoyment or some pleasurable experience. The ultimate answer to that question is left out for the individual recipient to answer, depending on his/her emotional experience.

When it comes to defining what is considered aesthetically pleasing, in the question regarding interface design, I will argue that a fourth factor is essential – interaction. If the interface is the aesthetic object and the user is the aesthetic recipient, there must be an interaction between them for the experience to emerge. In difference from the recipient gazing at the aesthetic object in art, the interface must communicate back to the user, creating an interactive experience (fig.3). For the experience to be positive, and thereby aesthetically pleasing, the interface has to be constructed and designed in a way the user can learn and understand, i.e. It has to be useful.
Design guidelines that allow for creativity

The question of whether or not design guidelines and principles restrict the designer’s ability to be truly creative in their work will not be answered in this paper. However, I will present a couple of perspectives on the issue. One argument is that an interface that is ‘easy to use’ is often described as ‘intuitive’. In other words, it means that it is ‘natural’ and works with our intuition, leaving no reason for rational thought. In his article, Raskin (1994) argues that all ‘intuitive’ really means in the context of user interface design, is that the features of it resembles something the user has experienced before and, therefore, is an almost exact synonym of ‘familiar’. If then the criteria for an ‘easy to use’, and thus successful, the interface has to resemble something that has already been done, the originality and creativity will be affected (Raskin, 1994).
Another argument on the question is that some guidelines and principles can be broad enough to be open to interpretation. If the designers are able to interpret the guidelines as they want, they are also able to mold them according to their own project and preference, and, therefore, be more creative. In the following three sections, I will explore these principles and guidelines based on HCI and interaction design. This I will do to get an idea of what lies behind the user interface designers’ decision, ideas that I will base my interface analysis on at the end of this paper.

**Human computer interaction: design principles**

For user interface designers to work with the human vision and it's system, Johnson (2014) suggests certain guidelines to follow. For an interface to be easy to use for its users, he explains, it has to be clear and consistent. By using a pre-decided graphic profile and keeping a balance of symmetry, as well as testing that all users interpret the interface, in the same way, ambiguity can be avoided. Designers should also be aware of the users' goals, what the purpose of the interface is and what its users will use it for. Goals can vary, and, therefore, the users' goals should influence their results, so designers should make sure that enough information at every step is provided. Another crucial fact to bear in mind is structure; our visual perception system will automatically look for all gestalt principles in order to find it, this can be made an easier process if information and graphics are structured in a hierarchical way by e.g. implementing columns and sections.
Interaction design: methods and techniques

Another view of design principles, from an interaction design point of view to be exact, is found in Löwgren and Stolterman's (2007) book. They suggest a few "guidelines", only, they call them methods and techniques. They stress that their following methods and techniques are no "how-to's" but rather a foundation that a thoughtful designer needs to be able to reflect upon. Also, much like an owner of an expensive camera is not necessarily a good photographer, a designer with the right methods is not necessarily a good designer. The result of the process can never be better than the capabilities of the person attempting the process. Rather, the following methods suggested by Löwgren and Stolterman (2007) can not simply be used, they have to be appropriated by a thoughtful designer; reflected upon and added to his/her's toolbox for appropriate use in relevant situations...

Inquiry

One crucial step in any design process is to analyze the design situation. Since design work takes place between what exists and what could exist, it is necessary to look at both the current and future situation. This is easier said than done, but it should be a continuous question in the designer's mind throughout the entire design process. According to the authors, there are two methods of doing this; by contextual inquiry and "why-why-why", both focusing on finding out the present. The first one, contextual inquiry, is taken from the field of human computer interaction, and consists of interviews combined with observations. The idea is that the development of the interface (as an
example) should be based on its future users. Therefore, the interviews are performed when the person who is being interviewed is working with a daily task. The interviewer sits by the user's side and discusses what happens on the screen and what it means. While doing so, the interviewer also looks for signs of distractions or disturbances, and how the interviewee handles any potential problems with the interface. After the interview, the information is analyzed as a whole to find a focal point, interpret the information and to form a new vision of the system (interface) that will be developed.

The next method is called why-why-why? And is based on the importance of asking questions (see previous section "a thoughtful process"). It is basically a method designed to build a 'why-chain' that will get to the root of a problem by creating a backward chain of reasoning from the original formulation, but at the same time enabling the discovery of a possible solution.

**Exploration**

The methods regarding inquiry are helpful when discovering the present design situation, but not so much the equally important future situation. That is why these following methods of exploration are for; exploration is the study of the possible, and of what might be. The first step of an exploration is to collect critique and ideas without letting anyone speak their opinion about it; this is done by allowing quantity over quality. Some exercises to gather these ideas can be to collect a group of designers, give them the stated problem, and let them go through e.g. a brainstorm or discussion.
The next step is to let quality take over quantity by letting the designers collaborate in choosing the best ideas, either by vote or by discussion. The last step would be to collect and redefine the ideas and form them into a vision that is useful for the final implementation. This method can be executed by using several different techniques such as a future workshop, brainstorming or a 635 session, to mention a few. (Methods can be found and explained further in Löwgren and Stolterman's book (2007)).

Composition

It is not always guaranteed in a design process that a designer will be provided with a whole; sometimes the designer must create the whole out of different parts. We know already that design is a composition of the existing and the not-yet-existing, but that is not all there is to it. Löwgren and Stolterman (2007) explains that the composition also consists of aspects regarding function, ethics and aesthetics, and in order for a designer to deliberate on all these factors, s/he must be able to balance them accordingly. One method of doing so is to apply a functional analysis, where information is gathered from various sources such as interviews, surveys and studies of competing products, and the information is then analyzed and structured in order to find out where more information is needed or not. When all information is collected, the concerned functions can be listed and later on analyzed with four different grades; essential (E), desirable (D), undesirable (U) or unknown (?).
Another method of creating a whole out of parts is to use techniques for detailed shaping. One technique is to create sketches at the same level as the production state, i.e., if it is early in the project, the sketch should be roughly made and a bit diffuse in order to demonstrate that it is far from the final result, and vice versa. A third technique is to create a written scenario around the system/interface/product, demonstrating who will use it, why, how, with what aims, etc. This is primarily done in the early stages of a design process to easier identify the design situation. Depending on what is being designed and developed, other methods includes creating a sketch of a potential interface, and a combined sketch of the interface and a scenario called a storyboard, and later on a prototype of the digital artifact. The core idea, however, is that a thoughtful designer should both be able to visualize the whole, even when only being given small parts of a project, and to be able to communicate that vision to coworkers and the client.

**Assessment**

During the design process, a thoughtful designer should apply techniques to evaluate his/her work. This can be done through usability testing, a well-known field of human computer interaction that works as well with interaction design. It consists of multiple tests and experiments where the intended users get to try the system (or interface) in a development stage and their interactions with are analyzed. One negative aspect of usability testing is that is can be both expensive and hard to find the right test participants, so another way of performing these tests were created. Those methods are
called inspection methods and are based on the psychological theories of HCI to e.g. create "substitute users", that can calculate possible usability problems in the design. Another example of an inspection method is called heuristic evaluation, where general thumb rules work as a foundation for a group of usability experts that takes a look at the proposed design and points out potential problems.

**Coordination**

The last category of methods to reflect upon is coordination that helps designers to manage all participants involved in the creative design process. Löwgren and Stoltzman (2007) borrows the method called The Six Thinking Hats from author Edward de Bono and explained its purpose as follows:

"The aim of the method is to identify the perspectives needed in a successful process of design or problem solving, to clarify communication in a group, and to promote collaboration instead of animosity. The six thinking hats refer to six perspectives, which are each assigned a color" (pg. 97). The white hat is neutral, and concentrates on the available information, what is missing, and how to fill the gap. A person wearing the red hat can instead concentrate completely on his/her feelings and intuition, without the need to justify anything. The red hat can make statements like "I have no doubt people will love this function, it feels modern and right". The person wearing the black hat is a bit more negative. The black hat is created to spot out potential dangers and risks of the projects and can make statements such as "this feature will never be profitable" or "that feature will be impossible to implement in the interface we decided to use". The yellow
hat, on the other hand, is quite the opposite, the person wearing it has to look at the project from the bright side and spot out potential benefits and opportunities of the project. The green hat is worn to generate creativity by questioning new ideas and alternatives. The person with a green hat could ask questions like "could we do this in another way?" or "what would happen if we switched places on these two features?". The last hat is the blue one, and it represents the sky and the leader. The person with the blue hat concentrates on the next step, summaries, conclusions and decisions. All six hats can be worn strategically by all different people in a working group, at different times. For example, everyone could put on the black hat at the same time to brainstorm potential problems with the project, or the green hat to brainstorm new ideas.

**Principles that combine HCI and IxD**

Even though creative design might contradict design guidelines, as mentioned previously in this section in relation to Raskin's (1994) ideas, Blair-Early and Zender (2008) suggests a set of principles worth keeping in mind when creating an interface that have to suit all types of users. The first principle to consider is the starting point, it has to be obvious. Much like a front door is clearly visible in architecture, the user must know where to begin. The second recommended principle is an obvious exit, because users need to be able to feel that they can leave the session at any time by e.g. hitting a "cancel", "exit" or "logout" button. Users also have to feel comfortable enough to try new things in the interface without damaging anything or lose any progress, and in order for that to happened there should also be a clear function of reversing any action, and
going back. The next principle called consistent logic, Blair-Early and Zender (2008) continues, might be the most comprehensive one since it is based on human logic. It states that all design patterns should have some relation to each other so that the user quickly can interpret functions and relate them to their effects. Simply, the users have to be able to depend on some level of consistency throughout the interface. The next important principle to follow as an interface designer is one called observe conventions, and it required the designer to be able to identify, consider and respect the impact of earlier interfaces' functions and design patterns on the users, and the users' learnt behaviors and expectations from them. This does not mean that the designer can not violate these familiar features, but that they should do so very carefully. An interface should also be easy to communicate with, and, therefore, provide the user with feedback at necessary instances. This can be compared to an approving nod in human-to-human communication, to inform the user simply that their actions are having an effect.

To avoid confusion about conceptual space and location, the interface should also have a few landmarks that tells the user about where s/he is, might go, and allow them to build a mental model of it. Like mentioned earlier with Johnson's (2010) gestalt principles, consistent proximity regarding clustered objects in time, space and concept should also be considered. Blair-Early and Zender (2008) recommend designers to keep adaptation in mind. A good interface should be able to adapt to its users’ special needs, such as poor sight or hearing. It should also allow users to customize their experience by e.g. organize frequently used interactions and functions. Besides
adaptation, another principle that is crucial to remember is that the interface is part of the content, but since the content has the leading role; the interface has to serve the content and not vice versa. Thus, the interface should grant all interaction elements with the ability to be as clear and direct with the content as possible, to avoid creating noise. The last principle from Blair-Early and Zender's (2008) recommended principles that I am taking with me to this project is one concerning metaphors. Metaphors in forms of graphic or animated content supposedly help to trigger memories and build associations, and can, therefore, be very helpful for users if used where content is new, ambiguous or narrative-based.

**Interface analysis: Facebook (mobile application)**

The design principles create an important base of knowledge about creating an interface that will be compatible with different types of users, but they do not provide any direct guidelines on how to make it aesthetically pleasing. Therefore, I have chosen to analyze a popular interface to try to find out the aesthetic design decisions behind it, as well as whether or not they are combined and/or influenced by the design guidelines I found. I chose to analyze a popular interface that has 798 million daily active users: the Facebook mobile application interface. The reason behind my choice is the extreme usage of the application, and how it, therefore, must be a very pleasing experience for its wide range of users. Facebook has users from all over the world, in all ages and all different types of social statuses.
**Interface overview**

Facebook's mobile application has, as I understand it, five core pages that users interact with daily (see fig. 4). The main menu (1) is a list of shortcuts to functions such as the personal profile, the event page, group page, apps page, games page, activity log, settings, etc. The personal profile (2) is where the user can overview what is being said about him/her, as well as customizing and organizing what is being displayed to friends (or the public, depending on settings). Here the user has options such as removing or changing profile picture, cover photo as well as managing posts that s/he is tagged in or has written him/herself. The timeline (3) is the page that made Facebook stand out among other social medias at the time it was created. This page allows users to watch live updates in a so-called newsfeed, which can include pictures, videos or links to other pages within Facebook or anywhere else on the internet, from all of their friends simultaneously. The chat window (4) is a shortcut to Facebook's separate app called Messenger, where users can communicate live with their friends through text, emoticons, pictures, video or video/audio calls. The notification list (5) is where the user gets important information regarding him/herself as well as close friends, birthdays, attending events and more.
Facebook interface
(mobile application, Iphone 6)

1. Main menu
2. Person profile (when logged in)
3. Timeline
4. Chat window (pops up over timeline)
5. Notifications

FIG. 4. Overview of Facebook’s mobile application interface.
Another important part of the Facebook interface is the static buttons and functions that follow the user through most pages. One example is the timeline (fig. 4.1), on top is the search bar where users can find content on Facebook such as users, public profiles, fan or group pages, locations, events, etc. To the right of the search bar is a symbol that directs users to the chat window and directly underneath are three buttons that allows users to create a post on their wall (and their friends’ timelines) based on three types of content. The status button is based on text, the photo directs user to their camera or photo library and the check-in button creates a GPS-based link to the place the user is at, allowing friends to see where the user is on a map. The rectangle underneath has a semi-transparent text saying "What's on your mind?", which is encouraging users to create a post. By pointing at the rectangle, users accesses the status update bar where they can create a post with any content: text, image/video or check-in (see fig. 4.2). The following to rectangles in fig 4.1 are two posts on the timeline, one written by a friend and the other one is a post of advertisement, suggesting the user to play a game. On the bottom is the navigation bar, as I call it, where the user can take shortcuts to the timeline (news feed), to friend request, messenger (the chat application mentioned earlier), the notification page or to the main menu ("more").
Main view - timeline

Enter chat
Search bar
Create a post
Textbox (shortcut) to creating a post
Posts from friends, occasional advertising
Navigation bar

FIG. 4.1 Overview of Facebook’s Timeline and its main functions, and

FIG. 4.2 The status update function.

Aesthetic decisions and the design principles

First of all, considering the gestalt principles as described by Johnson (2014), I would argue that Facebook has made some great adaptations to them. The spatial grouping of objects, called proximity, is clear and consistent throughout the interface. Symbols that belong together, e.g. the notepad (status), camera (photo) and location pin (check in) have the same basic function and are lined up next to each other, and the navigation bar is organized in the same way. This fact allows users to easily find the function they are looking for without the confusion, depending on their purpose. This is also
stimulated by the adaptation of similarity throughout the interface; all text belonging to
the interface is in the same grey tone, written in the same typeface. The pictogram of
symbols used throughout the interface are also example of similarity; they are all in
the same flat design and color scheme that creates a consistency. The grey symbols
are functions that lead the user to either a new page or a pop-up window while the
symbols in color (in the main menu) are symbols for different groups or applications.
Johnson (2014) also argues that our visual perception system automatically will look for
all gestalt principles in order to find structure, and that it can be made an easier process
if information and graphics are structured in a hierarchical way. This can be done by
e.g. implementing columns and rows, something that is also clear in the Facebook
interface. In the main menu, for example, symbols are grouped according to functions
such as groups, apps, settings, etc.

Based on Löwgren and Stolterman's (2007) book, the interface designers of Facebook
must be thoughtful ones. I base my argument on this by the way that the interface
adapts according to its user. For example, besides the fact that users can change their
profile and cover photos, friends that the user is communicating with often through
Facebook will appear at the top of online friends in the chat window, and posts written
by those friends will appear higher in their news feed. Löwgren and Stolterman (2007)
also describe the thoughtful user as someone who can analyze and adapt to the current
and future situation, what users need today and tomorrow. Facebook is in constant
development, and the company is on the frontier when it comes to adapting to new
technology, so I am left with no argument against why the interface designers of Facebook would be thoughtful.

A set of less abstract design guidelines are provided by Blair-Early and Zender's (2008) article. They argue about the importance of a clear starting and exit point, as well as a clear way of going back. The starting point, if the user is unfamiliar with Facebook is very clear. New users (or not yet logged in) are greeted with a login page, with the option to create a new account underneath. Users whose smartphones are already connected with Facebook never have to go through this step and are instead greeted with the last page they visited, or the timeline if they had the application closed. To log out of Facebook's mobile application can, on the other hand, be quite difficult for the first time user. The application does not encourage you log out, but if the user is experienced with other interfaces, the function is very logically found at the bottom of the main menu. Going back to a previous page is very similar to operating a web browser, there is an arrow in the left corner that feels very logic as well. To keep a consistent logic is crucial according to Blair-Early and Zender (2008), and also one of the reasons to why I believe that new users of Facebook's mobile application learn how to use it. It is clear that interface designers of the mobile application also thought about the web-based interface when they created it, in other words, they observed conventions. By observing conventions the designers considered and respected the impact of the earlier interface, and the changes they made were described and introduced with a tutorial when users opened the application for the first time.
The Facebook mobile application interface also makes it clear that the content is dominating the interface and not vice versa. It is clear for users what is part of the interface, and what is created by other users. The interface sticks to a discrete color scheme of blue and grey that allows the user generated content to grab most of the users’ attention. This, along with the fact that metaphors, in the form of symbols, are frequently used gives the interface a high aesthetic value, both in terms of usability and a pleasurable experience.

**Conclusion**

At an early stage in this thesis project, I had the idea to create an artifact in the form of three different interfaces. One interface according to the concepts and theories I would find when reading about aesthetics, I was in particular thinking about the article about user interface design principles (by Blair-Early and Zender) and the book Thoughtful interaction design (by Löwgren and Stolterman). One interface using the theories found in Designing with the mind in mind (by Johnson) and one interface combining all theories, concepts and guidelines I would find. My goal with the artifact would be to compare just how different the idea of aesthetics were, compared to rules of usability, based on my main argument inspired by Raskin's (1994) article about intuitive design. I was told that I could compare their ideas by using theories from human computer interaction, which were supposed to be more focused on usability, and interaction design, that apparently focuses more on creative design.
When I started reading the articles and books I had chosen for this project, I figured that it was not that simple. I learnt about the fields of human computer interaction and interaction design and realized that the latter is not too different from the field of HCI, it is based on it. If human computer interaction is the study of how humans and computers communicate, interaction design tells us how to design that communication by allowing better ways for users to interact with the system.

My thoughts regarding usability and aesthetics is that none of them is easily defined. Usability is depending on its users' level of experience in terms of reading and interpreting an interface, as well as thumb rules such as grouping related objects close to each other and keeping a consistent logic throughout its structure. The question of beauty and aesthetics is even more related to the users' personalities and is affected by their past experiences as well as their personal preference and their ability to understand how to use the interface. To sum up, the studies I have read and explained in this paper show that both factors are equally important and that a high level of aesthetics can even influence a user's perception of usability. This is also something I discovered in the section about the gestalt principles. Our eyes look for symmetry, logic and consistency, and if it is not found, our brains create it and forces our eyes to see it too. In other words, if it pleases the eye, it pleases the mind.
In this paper, I have come to the comprehension of the importance of aesthetics about usability in any interface design, that they both affect each other. Without a level of aesthetics, there would be no usability and without any consideration of usability in an interface, no user would find it aesthetically pleasing. In defining aesthetic interface design, I have found in design principles and guidelines that logic, consistency, symmetry and proximity are important factors for creating a whole, something that our brains are desperate to find. The guidelines for design might be bent towards creating usability in the form of logics and consistency, but in interface design there is no aesthetic value in chaos. Consequentially, one could not exist without the other, and the importance of aesthetics in any user interface is crucial.
Works cited


**Image credits**

1. Linda Lund, by combining two illustrations found on [http://google.com](http://google.com) (CC license, image search for gestalt principles, April 5, 10:23)

2. Photograph of an illustration from the book:


4.1 Screen capture of the timeline, Facebook mobile application, June 15, 2015.

4.1 Screen capture of the status update function, Facebook mobile application, June 15, 2015.