

# **Exploring Beauty in Visual Interfaces**

Gilberto U. Sepúlveda Bradford

*Human Media Interaction: Department of Electrical Engineering, Mathematics and Computer Science at the University of Twente: PO Box 217, NL-7500 AE Enschede, THE NETHERLANDS.  
[g.u.sepulveda@student.utwente.nl](mailto:g.u.sepulveda@student.utwente.nl)*

*Friday, May 18, 2012*

# Table of Contents

<b>Abstract</b>	<b>3</b>
<b>Keywords</b>	<b>3</b>
<b>Introduction</b>	<b>3</b>
<b>Background Knowledge</b>	<b>3</b>
Beauty	3
Aesthetics	5
Aesthetics Vs. Beauty	9
<b>Proposed Principles of Visual Aesthetics</b>	<b>10</b>
Clarity	10
Consistency	10
Familiarity	10
Novelty	11
Unity	11
Categorization of the proposed principles	11
<b>Experiment</b>	<b>11</b>
Aim	11
Participants	11
Setting	12
Materials	12
Procedure	12
Presented Design Projects	14
Results	19
Analysis of the Results	24
Discussion	29
Conclusion	30
Future Work	30
<b>Acknowledgments</b>	<b>30</b>
<b>References</b>	<b>30</b>
<b>Appendix</b>	<b>32</b>
Extended procedure description	32
Consent Form	35
Questionnaire	36
Results	54

# Exploring Beauty in Visual Interfaces

Gilberto U. Sepúlveda Bradford

*Human Media Interaction: Department of Electrical Engineering, Mathematics and Computer Science at the University of Twente: PO Box 217, NL-7500 AE Enschede, THE NETHERLANDS.*

[g.u.sepulveda@student.utwente.nl](mailto:g.u.sepulveda@student.utwente.nl)

---

Friday, May 18, 2012

## Abstract

In this research we will explore five proposed principles of visual aesthetics in graphical user interfaces. The principles are: Clarity, Consistency, Familiarity, Novelty and Unity. An experiment was designed to find if the proposed principles can be perceived by the participants.

## Keywords

User experience, Aesthetics, Visual design, User interfaces, Beauty.

## Introduction

“Do you like how it looks?” is often a question that many professionals in the visual design and user experience field tend to have about their users. While the question may be clear it does not give much information of why the user may take certain position on it or what prompted the user to take such position.

The aim of this research is to explore the existence of visual aesthetics principles. Like aesthetic principles in interfaces of digital devices such as: smartphones and tablets.

Our motivation for this research started with the hypothesis that there may be a set of principles that a designer may follow to make an interface more beautiful or aesthetically pleasing. Furthermore, we wanted to find out if not following the principles in question would impact negatively the perceived beauty of the interface.

Contemporary methods that address user experience concerning the visual aesthetics aspects of an interface tend to be limited at best.

There is potentially valuable information regarding the visual look and feel of an interface which could potentially aid visual designers, user experience designers and software engineers alike in building better products and producing a desired effect in what and how the user feels about a product.

While the branch of user studies / user experience research within the HCI field may seem to be relatively new, its relevance and presence has

always been prominent. As *Bloch, Brunei and Arnold (2003)* explain that visual aesthetics in interfaces, are one among other factors that can impact the user experience and user opinion about the overall product.

In the following chapters we will further explore this topic.

Because of the tendency of only addressing usability concerns due to its more objective character, and the apparent lack of methods to effectively address user experience aspects of a product (maybe, due to its apparent subjectivity). Studies tend to be limited and/or focused on the highly technical aspects of an interface. Many of them ignoring perhaps what could potentially be the most representative aspect of a product to the end user. It is worth remembering that after all, it is the visual design of an interface what the user sees right after the physical shell of the product itself.

After making such exploration of several aspects of beauty and aesthetics in general and proposing a series of principles or guidelines to follow, in order to make an user interface aesthetically pleasant or beautiful. An experiment that intended to address if a proposed principles of beauty were recognized, was conducted. The results were described and analyzed to aid future researchers in the field. The knowledge base of this research will be mainly divided in two closely interrelated topics: Beauty and Aesthetics.

## Background Knowledge

### Beauty

The following chapters will discuss various aspects of beauty and its implications.

### History

All cultures that have ever had an appreciation for beauty must have had an aesthetic sense, specifically “Expressive Aesthetics” which will be discussed in the following chapters. In many major civilizations such as the Egyptians, Greeks, Mayans and Aztecs it is possible to see a trend or a general artistic style.

What they considered beautiful and what they did not appreciate as such.

### Beauty in Nature

Dennis Dutton explains in both his TED Talk (*Dutton, 2010b*) and book *Art Instinct* (*Dutton 2010a*) an evolutionary based theory of beauty. He brings an interesting perspective on how beauty and the appreciation of it plays a role in nature and human evolution which will be further analyzed in the following chapter.

### Beauty in Human Evolution

Natural selection first introduced by *Darwin (1859)* and according to the conventional notions of evolutionary biology is the main mechanism in which species adapt to new conditions in the environment therefore preventing them from becoming extinct.

*Dutton (2010b)* makes a clear distinction in the way natural selection and sexual selection operate. He points out that natural selection is responsible for repulsions (e.g. rotten meat), fears (e.g. heights) and pleasures (e.g. liking for sweet or fatty foods).

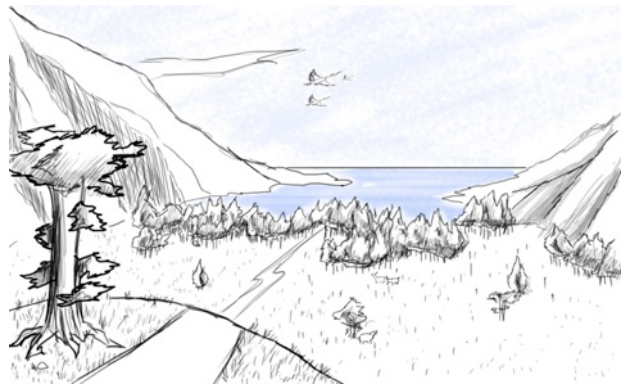
Meanwhile sexual selection operates differently; *Dutton (2010b)* points out at the peacock's tail which is regarded as an iconic example of natural beauty due to its incandescent colors and intricate patterns. The peacock's tail is an interesting example because while it may be regarded as beautiful, even by humans, it didn't evolve precisely for natural survival. Dutton argues that "the experience of beauty" is among others a way that evolution maintains arousal and sustains interest and fascination in order to encourage a subject or a person to make the decision most adept for reproduction and survival. In other words and as *Dutton (2010b)* stated in his presentation: "beauty is a tool of nature that acts at a distance which main function is to provoke attraction by simply looking at it."

### Beauty's universality

A common conception of beauty is that, it is strictly tied to the cultural context of the region. That what may be considered beautiful in one particular culture, may be considered abhorrent in another or could simply render irrelevant in another. However *Dutton (2010a)* points out that there are "cross-cultural and universal aesthetic values" that inspire a "magnetic experience which pleases the eye of the beholder". As an example he uses landscape art in which there is a particular landscape that it is

enjoyed by people of any culture due to its apparent reassemble with the savannah (in which it is presumed humanity originated from). This landscape is considered beautiful even by the people in countries where it does not even exist. As cited by Dutton in the experiment of *Balling & Falk (1982)* the perfect landscape formula should contain the following characteristics (**Fig. 1**):

- Open spaces with low grasses (to be able to see)
- Groups of trees spaced around
- Low laying trees (to escape from predators)
- Presence of a body of water directly in view or evidence of water in a close distance.
- Animals and/or birds
- A path or a road (riverbank or shoreline as well) leading to the distant horizon



**Fig. 1:** Example of a piece of art with all the elements mentioned to make it universally magnetic.

*Dutton (2010a)* further describes in his book "The Art Instinct" the reasons why this evolutionary preference for this type of landscape is more desirable for the modern humans.

One of the most prominent reasons of why this "blue landscape" formula is quite effective is because the picture is located on a hill. According to Dutton, high places that count with a broad view of the landscape provide a sense of shelter or safe place while allowing to analyze the whole panorama (which may explain why high rise apartments would tend to be more expensive than the lower ones). *Dutton (2010a)* further describes how deep walls of forest or lack of trees are also undesirable as opposed to groups of trees by connecting the necessity of our ancestors to find immediate shelter from potential predators since the landscape should have signs of animal and bird life which would likely also bring large predators along the way. (p. 19-23)

Experiments by *Balling & Falk (1982)* could partially confirm Dutton's idea that beauty could be at least

somewhat universal if not looked closely. *Balling & Falk* performed an experiment with children and adults where a series of twenty slides with four examples of a different biome were presented to the subjects. The subjects judged by each slide with a six point scale by how much would they like to visit the biome and then how much would they like to live in that particular biome. The experiment exposed that at least elementary school children showed a significant preference for the savannah biome while every other age would prefer the biome they were currently living at.

It could be argued that children who may be regarded as the least influenced by the current culture may be the best samples of our origins for our preference in beauty. Furthermore both *Dutton (2010a)* and *Seymour (2011)* agree with the idea that the appreciation of beauty can be altered and even modified by the experience or knowledge that exists of the object or subject. This could explain why some people may appreciate one thing over another and may render beauty again as a subjective and extrinsic value. Dutton further discusses in his book that while the majority of elementary school children enjoy the savannah-like landscape, experience plays a role in people's decision about what is beautiful. Experiences, familiarity or the environment may alter such preferences over the time which could explain why only elementary school children which have had the least exposure to experiences showed preference for the savannah-like biome found in the experiment of *Balling & Falk (1982)*. More explanations by *Dutton (2010a)* were given in his book "The Art Instinct". (p. 22-23)

### ***Embedded values in Beauty and Emotion design***

Both Seymour (2011) and Dutton (2010a) agree that what we may regard as beautiful can be affected by a series of factors, including previous experiences, familiarity and in general, knowledge about the object that is subject to be judged. Both agree that the beauty may exist in an extrinsic and intrinsic way; although Seymour clearly states that the former one is quite rare.

The user experience field of HCI is developing theories and patterns in human emotions that alter the state of the user as the designer intends doing it. Over the years professionals in computer science and graphical design alike have turned their attention in the emotional meaning of the product they create. All this is part of the studies of User

Experience and beauty is one among many of the values in the design of a product that can be perceived differently depending on the emotional state of the user at the moment.

This however does not mean that it is impossible to design a product that evokes an emotion, and therefore an opinion about a product.

Emotion design, a subset within the user experience design field of HCI, is in fact an example of a profession which is actively learning and trying to understand how the characteristics of a product such as look and feel can alter the emotional state of its user. Beauty or Aesthetics just happens to be one of the factors that is linked to the emotional state of the user in which a judgement by the user is produced and can be manipulated by the designer. *Norman (2002)* in his book "The design of everyday things" explains clever examples of how to embed the "fun" value among others into a typical design.

### ***The theory of Beauty***

*Dutton (2010b)* unfortunately takes a philosophical approach rather than a scientific one to explain many of his points. He admits that the multiple manifestations of beauty are an evidence of its presence. In other words that beauty is present in many different forms from the face of a baby to a goal in a soccer match. However he formulates a theory that is worth analyzing and that could be applied to any composition, including interface design. *Dutton (2010b)* states in his TED Talk: "We find beauty in something done well". In other words and as he describes it: "Human beings have a permanent innate taste for virtuous displays in the arts". We can infer from the last two statements that if something is done any less than well it becomes automatically ugly or at least anything less than beautiful. Dutton of course frames this in the arts.

### **Aesthetics**

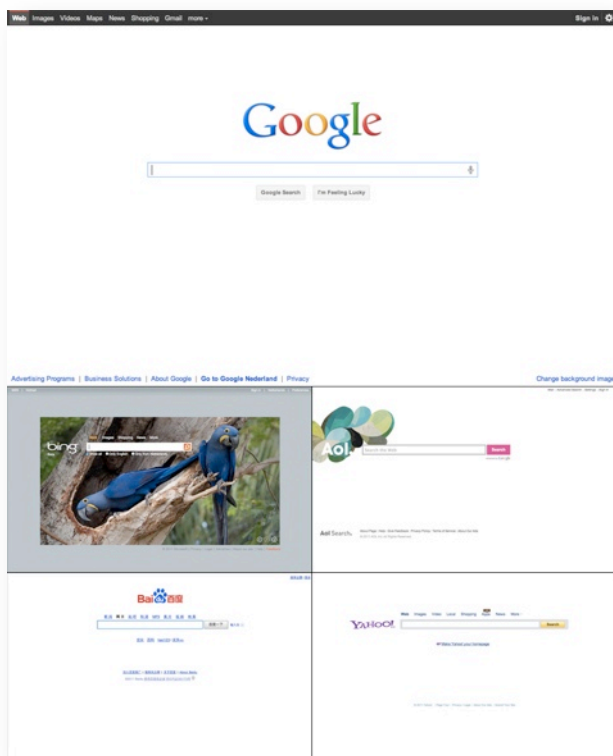
Various sources throughout this research prefer to the use of the word aesthetics over beauty due to its technical nature. The following chapters will discuss aspects of aesthetics. For the purpose of this research, beauty and aesthetics are interchangeable terms (*please read the Aesthetics Vs. Beauty chapter for more information*).

### **Aesthetics in a Contemporary era**

The expressive aesthetics vary according to their time and the culture that promotes it and interprets it. In art, aesthetics form streams or styles. In our current globalized and also

increasingly super connected world, visual designers must consider how aesthetics will be perceived by a global audience. As observed in **Fig. 2**; websites such as the minimalistic Google's homepage with a focus on its search bar are being used by people of very diverse backgrounds, age, nationalities, etc.

Google has the responsibility to visually please its diverse audience with their homepage. This task cannot be achieved easily; but a probable good indicator of their success in the aesthetics field is if other competitors such a Microsoft Bing (also an American company) or Baidu (the main search engine of mainland China) are following the same strategy aesthetic wise.



**Fig. 2:** Example of the minimalistic search-oriented approach popularized by Google (top) and being used by other major search engines such as Bing (center-left), AOL Search (center-right), Baidu (bottom-left) and Yahoo (bottom-right). Yahoo however does not follow this strategy in its main website; the figure is only showing an adaptation that Yahoo has made for the users who prefer a more minimalistic style.

According to *Alexa Rank* (Alexa, 2011) Google is the most visited website globally as for September 2011 and its demographics consist mostly of people with ages in between 18 and 64 years. Google.com is equally visited by males and females and people tend to browse Google.com in their homes, work and school.

Education wise people who visit Google.com range from people with no college education to people in graduate school. With such diverse demographics, Google requires to build an interface that should be aesthetically attractive to the majority of the world's population who has internet access; of course this cannot be an easy task.

Google's success is a combination of a series of elements including but not limited to its data, popularity, reach, accuracy, attractiveness, price, etc. The look of an interface (as it is in this case Google's homepage) generates the first message that a product transmits to a user by creating a first impression of it and implanting is in the user's mind. Over its 13 years of history; Google has made a series of modifications to the look of its homepage of course always maintaining a similar style to avoid appearing unfamiliar.

### Relevance of Visual Aesthetics

Although this thought may be wrong, it may not take a scientist to figure out that the eyesight is an important port where people retrieve information. Eyesight is the only port of visual information that humans have naturally. It is not surprising that due to the heavy reliance of screens in computer interfaces, eyesight is probably one of the main methods, if not the main method, for us to retrieve information, for the purpose of understanding computer systems whenever a graphical user interface is presented. The Aesthetic aspect of a product as noted by *Hollins & Pugh (1990)* in their book *Successful product design*, plays a significant even central role in the user's formulation of an opinion about a particular product. Given all mentioned earlier, it would not be surprising that aesthetics play at least a minimal to a significant role in the user's price perception as *Bloch, Brunel & Arnold (2003, p.552)* point out in their research; "Studies of visual aesthetics centrality also may enhance our understanding of the price consumers are willing to pay for a product". However some other studies like "Economic and Subjective Measures of the Perceived Value of Aesthetics and Usability" by *Ben-Bassat, Meyer & Tractinsky (2006)* have found the opposite result. *Ben-Bassat, Meyer & Tractinsky (2006)* conducted an experiment on how aesthetics plays a role in relation to bidding with money. They concluded that when money was not placed into consideration, aesthetics in a system played an

important role in the user's preference for a system. In other words, users did not necessarily prefer a system that had more features but was not very good looking over a system that had less features but was better looking. However, in another experiment they conducted later, with a bidding system with real money, they found that there is a correlation between money and performance. Users preferred the system with more features but less visual appeal. It is also worth mentioning that this study can be questioned by the uniformity of the profile of the subjects who participated in their experiment since all of them were undergraduate students of engineering. Nevertheless *Ben-Bassat, Meyer & Tractinsky (2006)* bring an interesting point for further discussion regarding the methods of evaluation of the current HCI school that could prove to be worth analyzing.

### *The power of first impressions*

It is a common concern to experts in the design industry to create a magnetic, visually attractive product that is able to make the costumer or user to pay some of his or her already saturated attention span in what the designer has produced. *Bloch, Brunel & Arnold (2003)* point out that it is generally not in the mind of potential buyers, users and costumers of a product to think on whether or not the product will actually do what it is supposed to do, therefore leaving plenty of space for the costumer to decide of which product looks more aesthetically pleasant. In other words, users generally expect that the product they are buying will actually work as it is described to do so.

*Papachristos & Avouris (2011)* suggest in their research that a costumer is able to create a judgement of the visual appeal of a website by just seeing it for 500 milliseconds, what is also interesting in this research is that they did not only find the short timespan that the potential costumer requires, but that the costumer is also able to perform a judgement in the usability, credibility and novelty of a website by just being exposed for that half a second. This research exposes the fact that the user does not need much time to formulate a broad opinion about a website; specially in aspects that are considerably relevant to the service providers such as the Credibility factor.

## *Aesthetics and its Dimensions*

In a broad sense Aesthetics (also known as Esthetics) is a set of rules, notions or principles about the appreciation of beauty. In philosophy Aesthetics is a branch that deals with questions of artistic taste and beauty according to (*Oxford Dictionaries, 2010*).

As *Lavie & Tractinsky (2003)* denote in their research there are two possible dimensions in which aesthetics can be divided into; which are Classical and Expressive aesthetics, both subjects of analysis in the following chapters.

### *“Classical aesthetics”*

The classical aesthetics consist of the set of nearly universal notions that every visual designer should know and apply. Some of those notions are based on human psychology and many of those are even backed with scientific evidence rather than empirical evidence. The classical aesthetics are defined by a series of rules or notions. In some graphical design branches such as editorial design, this notions tend to have more of a rule rather than a guidance character since breaking those notions would greatly affect the usability of the product.

Failing to follow this notions could lead to further complications such as making a document highly undesirable to read.

Some applied examples of classical aesthetics notions include Gestalt principles which reveal the principles of perception.

### *Principles of perception*

The following chapters will discuss the Gestalt principles of perception: Figure-ground, Continuation, Closure, Similarity and Proximity,

#### *Prägnanz (Figure-Ground)*

Gestalt principle of figure-ground proposed points that having a high contrast in between the text and the background is necessary for the eye to differentiate an object from the background (i.e. A black background with red text would make it undesirable for the user to read.) as it is shown in **Fig. 3** Similarly as placing textual information over complex backgrounds such as a highly saturated pattern can lead to undesirability from the user to read the information contained since it becomes harder for the eye to decode the information contained in the document as explained by *Koffka (1999)*.

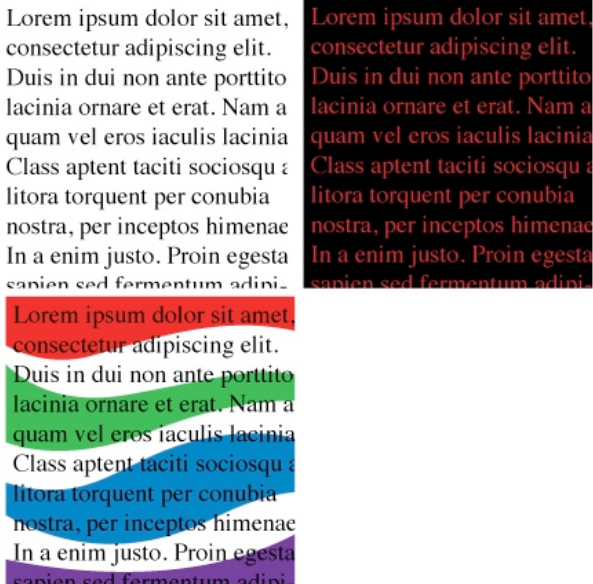


Fig. 3: Demonstration of the Figure-Ground principle of Gestalt in action. A regular paragraph (figure) is placed on three different backgrounds (ground). The most legible of all is located in the upper-left corner of the figure while the other two present troubles for the eye to separate the figure from the ground.

#### Continuation

The Gestalt principle of good continuation or simply known as continuation as shown in Fig. 4 takes effect only when the design leads the eye to follow an invisible line from one element to another. The continuation principle is practiced in many modern typographies, emblems and logos.

This principle is vital for some typographies that attempt to simulate the human hand-writing. (Koffka, 1999) Continuation is evident in typographies with serif and it is closely related with the gestalt principle of Closure which will be described in the following chapters.



Fig. 4: Demonstration of the Continuation principle. It is possible to see the principle in action (right) where the end of the letter "e" continues with the beginning of the letter "s" and the lack of it (left).

#### Closure

The factor of Closure describes how our brain tends to complete lines to form shapes as shown in Fig. 5. In many cases is not necessary or even desirable to link all the perimeter of a shape. By simply drawing most of its edges, the brain is automatically able to connect them and form a virtual shape. (Koffka, 1999) This effect is quite evident in cartoons and traditional animations. By playing a little with the perimeters of a shape and deleting some of them it is possible to encourage the vision and brain of the user to complete she missing parts of a shape.

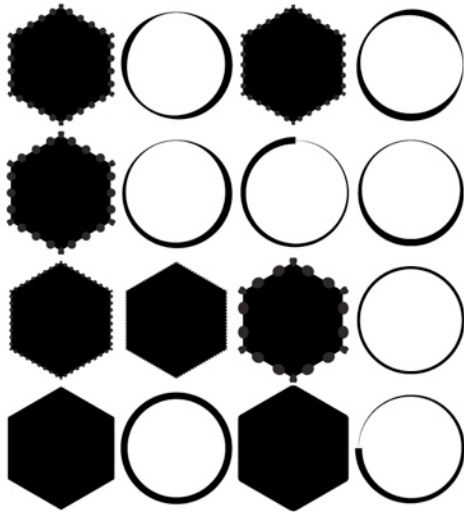


Fig. 5: Demonstration of the principle of closure. In the top example the closure is not enough to produce the closure effect immediately. Meanwhile in the bottom, there is more visual information about the missing part resulting in a higher accuracy but just enough so the user can complete the missing lines.

#### Similarity

Similarity explains as in Fig. 6 how our brain tends to group objects according to their shape. It is natural in humans to identify objects which are similar and group them together. (Koffka, 1999) In logos and general design styles similarity plays a relevant role. Similarity can be used in editorial design or in logos to create unity yet leave some free space for variation.





**Fig. 6:** Demonstration of the principle of similarity. Even though all the shapes are different since there is no repeated hexagon or no circle has the same contour; both types of objects will be grouped together in Hexagons and Circles because of their common shape and color. In the first and last column the shapes even share their position in Y axis.

#### Proximity

The proximity principle occurs when various elements are at a distance which is short enough for the brain through the eye to group together and form a larger shape. **Fig.7** demonstrates its use. Illusionist use this technique to create their artworks. *Starry Night* by Vincent van Gogh (1889) is a good example of this principle. If zoomed into a particular zone, one will find a series of ink patches being held together but by seeing it at a distance it is possible to appreciate the general picture and its elements which in this case would be a sky filled with stars and a bright crescent representing the moon over a rural town.



**Fig. 7:** The principle of proximity is shown in here with the star shape. A large body of stars are close enough to be associated in a group. Even though there are some other stars outside the main body in the example; the main body of the large star is clearly distinguishable. It would be possible to draw the perimeter of the large star with the eyes.

These conventional notions mentioned earlier are not the only notions that a designer should follow when creating a document. Gestalt principles and a series of other professionals in the area of design, psychology, architecture and art have proposed a series of recommendations to enhance or make a visual design more attractive to the user.

#### “Expressive aesthetics”

The “Expressive aesthetics” on the other hand are the additional value that a visual designer can add to a document. *Lavie & Tractinsky (2003)* define expressive aesthetics as the part of aesthetics that adds challenge to the aesthetics notions. It brings the thrilling element in the visual composition and it is where the designer can possibly differentiate its product from others.

The expressive aesthetics is the added value that a visual designer adds to a composition. It is not tied to usability requirements as the classical aesthetics are. It’s flexible enough to challenge different paradigms and it does change from time to time. In some branches of design, the expressive aesthetics represents almost the whole added value of a design.

In fashion design the expressive aesthetics are the responsible to define trends. In this industry the expressive aesthetics are so representative that seasonal trends are created. Empirical examples of this are the jeans; the types of cuts the jeans used to have in the 70’ are completely different from the cuts of jeans in the 90’ or even today. The 70’ are iconic for having jeans with a wide cut at the bottom. While in the 90’ a popular trend of jeans was the carpenter style often lose and with several pockets on the sides. While after the 2000’s the trend is more for skinny jeans that are tight in both the bottom and top of the legs.

#### Aesthetics Vs. Beauty

Aesthetics and Beauty are two closely interrelated terms. According to *Oxford Dictionaries (2010a)* Aesthetics is the branch in philosophy that is in charge of studying beauty and also “a set of principles concerned with the nature and appreciation of beauty” (*Oxford Dictionaries, 2010a*) while beauty is defined as the “combination of qualities” like shapes, forms and colour “that pleases

the aesthetic senses, specially the sight” (*Oxford Dictionaries, 2010b*).

*Dutton (2010b)* Defines beauty “as an adaptive effect which we extend and intensify in the creation and enjoyment of works of art and entertainment”.

It is important to highlight that different authors prefer the use of the word “Aesthetics “and apply it as a noun and adjective to diverse objects *Lavie & Tractinsky (2003)*. Others like *Dennis Dutton (2010a)* focus in broader aspects of aesthetics/beauty and therefore prefer the use of the word “Beauty” and apply it as a noun, adjective and even verb in their works. For the sake of this research, the Aesthetics and Beauty are interchangeable terms. The difference of meanings between Aesthetics and Beauty does not affect the objective of this research.

However the term Beauty was chosen to be used in the experiments due to its common use in the English language. The term Aesthetics on the other hand tends to have more of a technical character, therefore Beauty was found to be more desirable to be used in the experiment (*for additional information, please read the Experiment chapter*).

## **Proposed Principles of Visual Aesthetics**

The following chapter will discuss about a series of proposed principles of Visual Aesthetics. The principles are meant to decompose beauty in several elements in order to be tested. It is worth mentioning at this point that this are not all the principles that could exist to make an aesthetically pleasant interface or design. Over time and with the growing body of research in the HCI field some other principles could be discovered and proposed. The five principles that we are going to treat in this research are: Clarity, Consistency, Familiarity, Novelty and Unity. All the principles should be understood as degrees rather than absolutes. (e.g. An interface may contain a great amount of consistency, medium consistency or little consistency).

### **Clarity**

The Clarity principle covers several of the Gestalt principles. Specially the Prägnanz principle. Since all visual interfaces are meant to be used for a purpose; Clarity is a key characteristic that an interface should have to perform its function. If the interface is highly saturated with elements it could discourage the participant from using the interface because it could be perceived as too saturated or overcomplicated. On the other hand if most elements are hidden from the

user’s eyesight the interface could be perceived as limited or useless. Finding a balance in the right amount of Clarity is key for a successful interface design. It could be argued that both Clarity and Unity (*which will be explained later in the current chapter*) play similar roles, while one focuses on the grouping of elements according to a common characteristic the other is in charge of creating blank spaces to allow the interface to be perceived as understandable and if used in the right amount not boring either.

### **Consistency**

The principle of Consistency is concerned with whether or not the elements of an interface follow a general rule that they can relate. (e.g. Let’s suppose there is an interface with buttons of several colors. Only the red buttons of this interface lead you to the next page. And while they are being clicked they glow. Now let’s suppose there is a red button that leads you to the next page, but this one in particular does not glow while being clicked like all the other ones. It is highly likely that the user will notice this inconsistency and perhaps even think that the not-glowing red button is broken.) Consistency gives a visual context to an interface by determining a style. If the style is broken inconsistency becomes noticeable and could potentially make the whole interface look unfinished, amateurish or simply dysfunctional. Consistency also extends all across a whole design project. In other words, it is desirable to maintain consistency of colors, fonts positioning of elements, etc. even among different compositions within a design project. This is specially evident in the design of a company’s brand identity. Some brands are quite effective at maintaining their brand identity while others fail to do so.

### **Familiarity**

The principle of Familiarity is concerned with how much the interface and its elements relate to the previous user’s experience. Familiarity can however undermine the Novelty (*which will be explained later in the current chapter*) in an interface. It could also provoke the user a feeling of boredom. Nevertheless Familiarity is a resource that all visual designers have since it is the principle that relies in the user’s intuition based on his/her experience. It economizes any learning curve of an interface. Familiarity saves the user from learning new methods or remembering new icons to effectively use the interface. (e.g. If one is presented with a button of a House with a gable roof in a website, it is simply

logical that the house will lead to the homepage and not the location page of the business. In the same way, no other types of house roofs are as widely accepted as the gable roof for the home button of modern interfaces. Of all the possible house roofs designs -e.g. shed, mansard, gambrel, flat, hip, etc.- only the houses with a gable roof are the ones that are typically depicted as the home button of any interface in a computer.)

### **Novelty**

Unique among the others Novelty is the space where designers can insert their “Expressive aesthetics”. It refers to the new shapes, forms or methods in an interface that look or behave slightly different from what is already familiar in the user’s mind but different enough to be considered original. On the other hand, Novelty may open the user’s vision to new methods or graphics of an interface. The user should feel just uncomfortable enough to be thrilled or surprised by the new method rather than disturbed or annoyed. Like Clarity, finding the right balance of Novelty is key to make an interface visually magnetic.

If the interface happens to present a very high amount of novel methods or graphics the user may feel overwhelmed and label the interface as overcomplicated or useless.

### **Unity**

The principle of Unity is concerned with the placement of the elements and how well they play with each other as a group. The principle of Unity is naturally associated with the grouping of the elements. Unity metaphorically speaking is like a puzzle game. In order to have the complete picture one must design all the puzzle pieces so they fit together with one another in the exact place where they are intended to be. The position of an object in an interface could greatly affect the Unity of an interface if this one is isolated. However exceptions can be possible if there is a specific purpose of isolating an item from the rest of the group. The Gestalt principle of proximity as well as continuation tends to present a vital role in forming unity in a composition such as a visual interface. It could be argued that the function of the principle of Unity is to group all the elements of a composition by their characteristics, similarity or semantics.

## **Categorization of the proposed principles**

Out of the proposed principles only the principle of Novelty belongs to the Expressive Aesthetics set while the rest are members of the Classical Aesthetics set. Unlike the rest Novelty is the only principle that begins from what is unknown to the user. In addition this principle gives some space to the designer to even propose new methods, graphics, icons or animations that challenge the user’s expectations to explore and become familiar with the interface. Novelty marks the difference between boring or usual, and exciting or unique.

However since Novelty relies on what is not expected by the user it must find a balance with its counterpart Familiarity. A designer should always look for the right balance between Novelty and Familiarity otherwise too much of one will either lead to dullness (since the interface does not present anything new) or frustration (since the interface is so unpredictable that it becomes difficult to control it).

### **Experiment**

With the use of the current knowledge an experiment will be performed to prove the validity or lack thereof, of the hypothesis presented in the following chapter.

### **Hypothesis**

It is a fact that humans judge things by the way they look, among other factors. Let’s hypothesize that Beauty can be decomposed in a number of elements, specifically the proposed principles in this research. We believe that the proposed principles can be perceived by our participants and that some of them may even have more relevance over others because they may be easier to perceive. Since some or all the principles may be perceived, we also believe that they may have a weight in the positive/negative opinion by the participant.

### **Aim**

The aim of the experiment is to find if beauty in an interface can be decomposed in several elements. And if so, then what are the most relevant recommendations to follow to create a beautiful interface.

### **Participants**

The participants of the experiment were people between 18-40 years old. All of them had a university degree and were related in some way to the University of Twente. All of them were able to speak

the English language fluently and use computers in their daily life.

### Setting

The participants were tested in a controlled environment in front of a computer. An application was developed to allow the user to follow the steps mentioned in the following chapter. The system was able to collect and store the input of the participant. The experiment supervisor always left the participant alone in a confined space to take the test without disturbances. The experiment supervisor was at all times outside the room where the participant took part in the experiment. The experiment supervisor had to be ready to give assistance or answer questions to the participant on his/her request.

### Materials

The participant worked on a computer with a screen, a mouse and a keyboard. Under the keyboard an A4 envelope was positioned with the prints of the interfaces that follow all the principles in both Project 1: Music Player and Project 2: Internet TV (*More information is available in the Presented Design Projects chapter*). A marker was placed on the left side of the keyboard.

### Procedure

The following chapter will describe the overall procedure of the experiment. *To see the extended (detailed) version of the procedure please read the Extended procedure description in the Appendix. Additionally, it is possible to find all the documents required to conduct the experiment in the Appendix.*

#### • Before taking the experiment

The participants were given a consent form where they agreed and accepted the collection of data for the purpose of this research. (*The consent form has been added to the Appendix for further information*). General questions about the background of the participant like gender, age group, highest level of education and previous formal visual design education were asked.

#### • Task 1.1

**Description:** Two static interfaces were presented side by side. One following the specific principle while the other one lacking of one of the principles. The participants were supposed to choose the most beautiful interface. This step was repeated for each proposed principle and for both project 1 and 2. In other words this step was repeated 10 times.

**Question:** Which interface is more beautiful?

**Possible answer:** Either interface A or interface B (both code-named: *see the “Code Naming of the Interfaces” chapter for more information*) without being able to select both simultaneously. Filling this result was of mandatory nature.

**Result:** The result should have answered, whether or not the principles presented were noticeable by the participant.

#### • Task 1.2

**Description:** A text box was presented where the participant was able to describe why he/she considered one interface more beautiful than the another. The text box was presented right after the elements of task 1.1, and every time task 1.1 had to be repeated. The elements of task 1.1 and 1.2 were placed in the same page.

**Question:** Why do you consider your selected interface more beautiful than the other?.

**Possible answers:** The possible answers were always textual, and it was not mandatory for the participant to fill this space.

**Rationale:** This step is a qualitative element in the experiment. It is merely there to find possible adjectives that could be used for future research. If trends are found within this part they should show in the results.

**Results:** The results of this task were intended to be used to understand the reasons of why the participant opted for one option over another. They also worked to find anomalies in the test.

#### • Task 2.1

**Description:** After judging all the possible combinations of task 1.1 (10 in total) of the two design projects. The participant was asked again the questions of 1.1 but the question was modified to place him/her in a situation where he/she had to think for everyone else.

**Question:** Which interface do think everyone else would consider more beautiful?

**Possible answers:** Either interface A or interface B (again code-named both: *see the “Code Naming of the Interfaces” chapter for more information*) without being able to select both simultaneously. Unlike Task 1.1 an extra option was added to allow the participant to maintain a neutral position in this step. The Don't know / Can't tell allowed the participant to not take a position in the presented options. Filling this result was mandatory.

**Rationale:** We believe there is a difference if the participant has to position himself or herself in a

personal judgement versus a judgement for everyone else's opinion or global opinion. This task was intended to address if the opinion of the participant changed when he/she had to think for a larger group rather than himself or herself.

**Result:** The result on this task was intended to be able to address if the judgement of beauty in the participant experiences any change, by making the participant to think for everyone else rather than only for himself or herself.

- **Task 2.2**

**Description:** Like task 1.2, a text box was presented. It had the same function and characteristics to the text box of task 1.2. The Possible Answers, Rationale and Results were the same. Only the question was changed.

**Question:** Why do consider that anyone else would find the selected interface more beautiful than the other?

- **Task 3.1**

**Description:** A series of adjectives were presented to the participant. The adjectives presented to the participant were based on the *Attrakdiff Questionnaire by Hassenzahl, Burmester and Koller (2003)*. The participant then was able to judge which adjectives applied to the interface in Project 1 (Music Player). An image of Project 1 was placed to create visual context.

**Question:** Please checkmark the words that in your opinion apply to the current interface.

**Possible answers:** A series of adjectives were presented to the participant. *The list of adjectives can be found in the Extended procedure description in the Appendix*. The participant could answer with one or more adjectives. At least one adjective had to be assigned in order to proceed to the next step.

**Rationale:** We wanted to further analyze how the participant perceived the interfaces with all the principles in play. Yet we did not want to get results that may differ vastly and end up with a set of answers that are impossible to analyze. For this reason we have decided to limit the adjectives to a determined list and *AttrakDiff's* adjectives by *Hassenzahl, Burmester and Koller (2003)*. Not all adjectives were used. The order of the list was randomized, so each time a participant got to this part of the experiment, the order of the adjectives would be different.

**Results:** The participants can define a trend describing the interfaces. Since there is no universal vocabulary for beauty, we will need to

limit the list to a number of adjectives that can render a trend.

- **Task 3.2**

**Description:** Task 3.2 was repeated in the exact same way as Task 3.1, except that, instead of including an image of Project 1 (Music Player), an image of Project 2 (Internet TV) was placed.

- **Task 4 and Aftermath**

**Description:** The participant was asked to open the enclosed envelope (a physical envelope) containing two documents. A projection of the two interfaces that follow the five principles in the theory were presented underneath the a message providing the instructions of how to proceed (*For additional information or to find the literal message please read the Extended procedure description in the appendix*).

**Contents:** The participant found two pages size A4 each one with one interface printed on it. The two interfaces printed were the interfaces that followed the 5 proposed principles according to the theory in this research. Each page contained one interface. The user was asked to highlight the areas he/she found the most beautiful.

**Question:** Highlight the area or areas that you find the most beautiful in the interface.

**Possible answers:** The participant may have circled or framed none, one, more than one area or the whole interface.

**Rationale:** This step was meant to focus on the elements that the participant focused on. It goes beyond the broad question "Which interface is more beautiful?" it allows the participant to explain why he/she liked the presented interfaces in a graphical way, without having to describe it with words. The selection of the interfaces was limited just to the project that fulfilled all the principles in order to make the experiment reasonable on time.

**Results:** With the information of multiple participants, it may be possible to generate heat maps that determine what were the elements that made a given interface aesthetically beautiful.

### Code naming of the interfaces

All the interfaces were named after a code system in order to make the results easier to analyze. The naming system worked in the following way:

- I. **The first 4 characters** (reading it from the left to the right) of the name indicated whether or not the interface follows all principles, and if not it indicates which principle is not following:

(e.g. If it followed all principles it would use the characters “WAPR”, if it did not follow the principle of Clarity then it would be “WOCL”. WAPR stands for -with all principles-, while WOCL stands for -without Clarity.); the possible combinations were: WAPR (With all principles), WOCL (Without Clarity), WOCO (Without Consistency), WOFA (Without Familiarity), WONO (Without Novelty) and WOUN (Without Unity).

- II. **The fifth character** of the name indicated the order where it was supposed to be placed. The possible characters that could be placed in this name were from the number 1 to the number 5 (e.g. WOFA3-- means that it is the interface without familiarity due to WOFA, and it is 3rd principle that was going to be placed in question. On the other hand, WAPR1-- would mean that it is an interface with all the principles and it was going to show up in question 1).
- III. **The last two characters** indicated to which design project it belonged. The possible characters could have been only “MP” or “IT”: MP for -music player-, while IT for -internet television-.

## Presented Design Projects

### Project 1 (Music Player)

An static interface for a Music Player was developed. This type of interface could be displayed in a mobile device such as a smartphone.

For organizational purposes, in following examples the interface applying the principle in question will be always shown on the left side of the figure. In the experiment however, this order wasn't implemented. Instead, the interface following the five principles could be either on the right or left side of the page.



**Fig. 8:** This is the master interface for the Project 1 (Music Player) it follows the five proposed principles according to the theory.

### Master Interface of Project 1

This is the master interface of the project 1. It follows all the principles presented on the theory of this research as shown in Fig. 8. The following chapters will analyze in detail and include the proper visual examples on where the principle is being followed and where it has been ignored.

### Clarity in Project 1

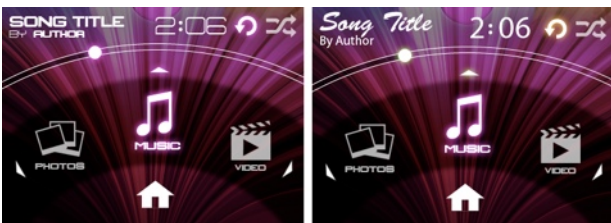
As shown in Fig. 9 the principle of Clarity is being followed by the Master Interface (left). The interface on the left side of Fig. 9 leaves some space where the gradients of the background can be seen. Meanwhile on the right of Fig. 9 it is possible to see an interface richer in information that uses almost all the visual real estate of the screen. The principle of Clarity is clearly being broken for this to be accomplished.



**Fig. 9:** Clarity is shown in the interface of the left while the interface on the right shown as more saturated and less clear.

### Consistency in Project 1

In **Fig. 10** it is possible to appreciate the principle of Consistency in multiple levels. The interface of the left side of **Fig. 10** shows Consistency in the use of font families all across the textual elements. In addition Consistency is again demonstrated in the pink glow that the active buttons are emitting. On the right side of the image the principle of Consistency is broken by showing a greater number of font families that may not even have any visual relation. It's specially evident with the header of "Song Title". In addition the active buttons glow in different colors. Both interfaces present the same number of elements and almost the same position of them, except that one follows the Consistency principle among others and the other one does not.



**Fig. 10:** Consistency is shown in the interface of the left while the interface on the right show an interface with a diverse number of fonts and different colors of glowing buttons.

### Familiarity in Project 1

In **Fig. 11** the principle of Familiarity is shown in the two pieces of the interface of the left. In the top-left corner it is possible to appreciate a music CD. An element familiar and usually related with music, media or documents. The top-left corner is an unusual demonstration of the principle of Familiarity and Novelty together (*The reason why it also follows the Novelty principle will be explained in the following chapter*) while in the bottom-left corner, it is possible to appreciate a

composition of the principle of Familiarity at its best, using icons that have been already popularized by companies with a lead or influence in design trends, like Apple Inc. The musical note is iconic for the iTunes brand of Apple, and it is synonym of music. The same would apply to the icon used in video again with the popular icon of Apple's FinalCut Pro, which is a popular video editing software normally used in the video production industry. As for photos, it was based on the now discontinued Polaroid instant photography, which was widely adopted by the global community at the time and it's brand photo frame became synonym with instant photography. All the icons present an additional textual label simply to reinforce familiarity in the user and reduce the learning curve.

As for the top-right hand corner of **Fig. 11** the visual composition is showing a common projection of the cropped album cover rather than the CD itself, giving probably not enough information to the user on how would the item look in reality ergo not allowing him to relate it to a tangible and familiar item. On the bottom-right corner of **Fig. 11** it is possible to appreciate the controls of the interface. This time label-less forcing the user to rely solely on his/her intuition of the meaning of each icon. While it's possible to quickly assume that they mean Photos, Music and Video, it's also possible to think that they mean Photos, Movies and Recordings. In addition, in the bottom-right corner of **Fig. 11** the little door of the house icon was removed. In essence it is a more simplified version of the icon of its counterpart. Nevertheless it could prove to be just too simple to be confused with an icon with another function.



**Fig. 11:** Familiarity is shown in the two pieces of interface of the left while the two pieces of interfaces on the right show a more iconic oriented interface. The interface on the top-right part of the image is demonstrating a snippet of the cover of the CD while its counterpart shows a physical music CD. The piece of interface on the Bottom-right corner of the figure demonstrates an interface without text and solely based on icons.

### Novelty in Project 1

As demonstrated in **Fig. 12** the principle of Novelty is followed in the left side where a piece of the interface is shown. As discussed earlier in the chapter *Familiarity in Project 1* the CD shape follows two proposed principles. The CD shape is indeed in resemblance to a physical and tangible object in our common lives that we relate with music, media, movies or information. Given the context, it is easy to find why a music CD is being displayed in this interface. It familiar for the reason mentioned earlier, yet it is novel because the most popular interfaces of Music players have a tendency to display the album cover rather than the CD itself. This difference is irrelevant to its use, the information presented is slightly the same yet it makes a difference and adds the element of excitement. In the meantime in the right side of **Fig. 12** it shows the traditional album cover as any other Music player interface would generally display. While this element at the time of its release was novel, it is no longer the truth. It has become the standard and it is to be expected in a music player interface. This is a clear demonstration that the Novelty principle is time dependent just as the Familiarity principle. One seeks to change while the other to preserve. The other clear element that presents a degree of Novelty is the music time bar. Most if not all music time bars are a straight horizontal bar. This bar is both Consistent and Novel because it has the shape of an arch yet the change is just different enough to make the user consider it Novel and easily to adapt to, rather than

uncomfortable and difficult to understand. In other words, it is the same concept with a twist.



**Fig. 12:** Novelty is demonstrated in the left side of the figure. The interface displays a rotating interface rather than a flat one. Except for the song title group the whole interface is rotatory, even the timer bar. On the right side it is possible to see a demonstration of a traditional interface for music playing. It does display all the elements of the interface of the left but in a way that most music players in the market would display at the time of the writing of this research.

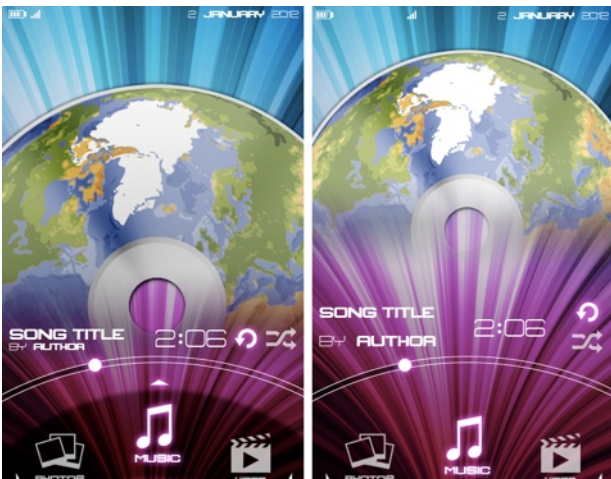
### Unity in Project 1

In **Fig. 13** the left side of the figure demonstrates an interface with elements grouped in island according to their functions and look. Unity brings a hint of context to the user of what does what. The dark band was added at the bottom to create a relationship between the Photos, Music and Video icons. All the controls that control and inform about the time of the song are grouped together. The battery and signal icons are grouped together in the top-left corner of the interface while the date is a separate island on the right. Meanwhile in the right side of **Fig. 13** it is possible to appreciate almost every element is a separate island. Although they still have some degree of unity but not as much as the counterpart example. The most evident changes are in the top and bottom of the interface. The battery and signal controllers are separate entities and while they are in the same line they are far enough to conceive them as non-related buttons that lead to non-related functionalities. Both the battery and signal icons are system related icons and this is the reason why they are grouped in the example of the left side of **Fig. 13**.

A detail oriented reader would then question himself or herself why the date is a separate entity of it's own in both examples. The date is not united with anyone and could probably be attached with the



icons of battery and signal. However we decided to set them apart for two reasons, one to create visual balance between the left and the right, a perception principle that we won't discuss in this research but it would be worth analyzing. The second reason was to prevent the user from relating this interface with the standard interface of both Google's Android and Apple's iOS devices. Both interfaces have proved to be highly influential in the construction of anything related with the visuals of mobile devices. Both interfaces also present excellent examples of many of this principles, but this won't be discussed in these chapter.



**Fig. 13:** Unity is demonstrated in the left side of the figure. All the elements are grouped in islands according to their context of use and style. Meanwhile on the right-side of the figure all the elements are sparsely separated from each other. The black band under the menu icons has been removed as well. Except for the dark band, all the elements are placed again but sparsely separated.

### Project 2 (Internet TV)

Project 2 was intended to depict an interface intended to be used on a television that can connect online and play a variety of videos on the web or traditional channels. It's worth mentioning that like previous project and for organizational purposes, in following examples the interface applying the principle in question will be always shown on the top side of the figure. In the experiment however, this order wasn't implemented. Instead, the interface following the five principles could be either on the right or left side of the page.



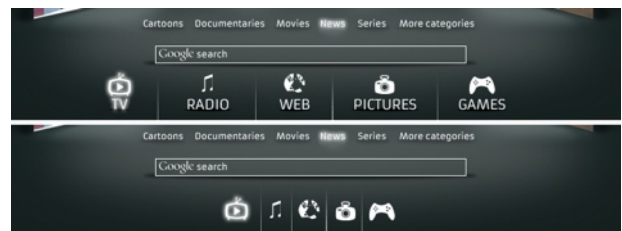
**Fig. 14:** This is the master interface for the Project 2 (Internet TV) it follows the five proposed principles according to the theory.

### Master Interface of Project 2

This is the master interface of the project 2. It follows all the principles presented on the theory of this research as shown in Fig. 14.

### Clarity in Project 2

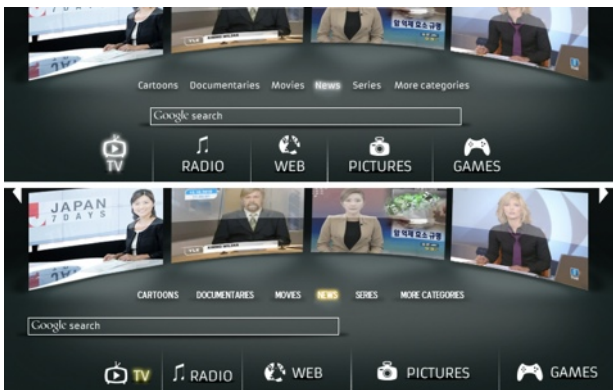
In Fig. 15 one can observe an example of Clarity applied in a balanced way (top example) and the principle of Clarity applied in a more pronounced way (bottom example). Clarity can be used to enhance the visual aspect of an interface. However like Familiarity and Novelty, Clarity should find a balance. If Clarity is applied excessively, in way that harms the very usability of the interface, it may end up being undesirable for the user to use. This example is the complete opposite to the example of Clarity in Project 1. In this example the master interface is the one that has less open clear spaces but does not compromise on the meaning of each label.



**Fig. 15:** The top example is the master interface where Clarity is less evident. The menu in the top example is labeled unlike its counterpart. The bottom example economizes even more the space by creating even larger clear spaces and compromising on the usability of the menu. However the principle of Clarity applies to an extreme can also produce a problem.

### Consistency in Project 2

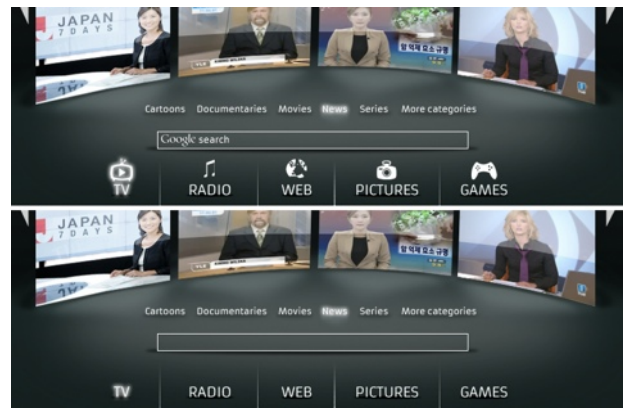
The principle of Consistency in the project 2 is best shown in **Fig. 16** where the top example shows an interface following the principle while the bottom example shows an interface that violates this principle in multiple ways. The most evident of course is because of the alignment of the items. The channel categories are aligned to the center while the Google search bar is aligned to the left and the global menu is aligned to the right. Perhaps less obvious is the color of the glow of the selected items. They are two different shades of yellow but one is brighter than the other. Also it may appear that the space between the buttons of the global menu have different spacing.



**Fig. 16:** The top example is the master interface where the principle of Consistency is evident, the alignment of the objects is always in the center. While in the bottom example, the principle is broken with the alignment of the elements and perhaps less evident with the typography used in the menu as well as the color of the glow of the selected items.

### Familiarity in Project 2

The principle of Familiarity is applied in the top interface of **Fig. 17** while the icons are removed in the bottom example and just text is left. The user will now need to get used to an icon-less interface making it hypothetically harder or less significant to the user to remember the items. The words will now be identified by their meaning and their place in the interface unlike the top example of the figure. Novelty is also in a way indirectly sacrificed in button example since no novel icons can be presented. It is worth noting that unlike *Familiarity in Project 1* the pictures icon has changed and was also renamed. This has been done to fit with the context of the interface.



**Fig. 17:** The top example is the master interface where the principle of Familiarity shows icons in addition to their respective labels, in order to create some expectation from the user. While in the bottom example, the principle is not necessarily broken but no visual icons that can create some Familiarity in the user's mind are presented at all.

### Novelty in Project 2

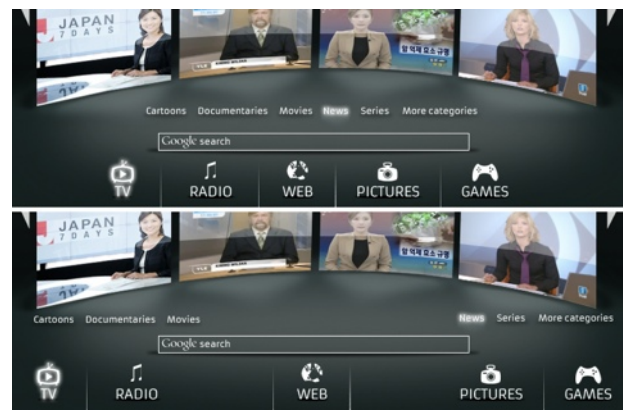
In top example of **Fig. 18** it is possible to appreciate the cylinder shape of the screens. It gives a feeling that one is observing multiple little screens at a distance. This could be considered Novel at the time of the writing of this research. Meanwhile in the bottom example the principle of Novelty is ignored by presenting what would usually be found in any other related product. The TV icon top center of the top example, had the responsibility to remind the user in what section was at. Unfortunately in the bottom example it was not possible to place it because the flat screens required that space to be occupied. For this reason the icon was eliminated.



**Fig. 18:** The top example is the master interface where the principle of Novelty is evident by the cylindrical shape of the displays. While in the bottom example, the principle is broken by presenting what is to be expected according to the current interfaces on the market such as Apple TV or Google TV.

### Unity in Project 2

In the top example of **Fig. 19** the principle of Unity is respected. The elements are grouped in a logical way according to their function and visual aspect. The buttons of TV, Radio, Web, Pictures and Games have a similar visual aspect. Each one of them contains an icon so it is logical to distance them equally and align them in the center as the elements above. Meanwhile the bottom interface presents a rather odd grouping and islands that do not make sense such as Web. The element of web is a stand alone item; it would be rational to place that arrangements if web was the main purpose of the system but then we would need to respond why TV and Radio are together and Pictures and Games are their own island apart. Also the categories of the programming are divided in two groups. All the buttons of the programming island have a similar look and functionality. It is easy to realize that it makes no sense to distribute them apart in two pieces.



**Fig. 19:** The top example is the master interface where the principle of Unity is evident by the arrangement of the elements of the menu. While in the bottom example, the principle is broken by presenting a rather odd grouping of elements.

## Results

### Demographics

The experiment had 11 participants.

- **Gender:** 3 out of 11 identified themselves as females while the remaining 8 identified themselves as males.
- **Age:** 6 out of 11 reported being in the age group of 22 to 25 years old while 4 reported being 26-30 years old. Only one reported being 18 to 21 years old.
- **Education:** 5 out of 11 reported having completed at least a 4 year bachelors degree. 4 reported having completed at least an HBO according to the Dutch educational system. Only 1 reported having completed a PhD and only 1 participant reported having completed a VWO again according to the Dutch educational system. All the participants, except for one reported as being currently studying in a higher level of education than the one they already attained.
- **Visual design education:** 7 out of 11 reported having some formal education or experience in Visual Design or Graphic Design while the remaining 4 reported not having any. No participant reported being unsure about this question.

### Principles

The following sections will enlist the results according to each principle. Each principle had at least 4 different results, two for Project 1 (Music Player) and two for Project 2 (Internet TV). The first result of each project reports the results of the participant's personal opinion (Obtained from Task 1.1: See Task 1.1 section in the Procedure chapter for more information) while the second result of each

project reports the results of the global opinion or the everyone else’s opinion according to the perspective of the participant (Obtained from Task 2.1: See Task 2.1 section in the Procedure chapter for more information).

It is worth mentioning that while this paper calls the results of task 2.1 the “global opinion”, this is not the global opinion of all the participants taking the test, but the opinion that the participant felt was the global opinion. For the sake of readability we have decided to simply call it the global opinion.

### Clarity

- **Project 1 (Personal Opinion):** As shown in Fig. 20, 10 out of 11 reported personally preferring the interface that followed the five principles (WAPR1MP) over the interface lacking of the Clarity principle (WOCL1MP). Only one preferred otherwise.
- **Project 2 (Personal Opinion):** 8 out of 11 reported personally preferring the interface that did not follow the Clarity principle (WOCL1IT) over the interface following the five principles (WAPR1IT). 3 preferred otherwise as shown in Fig. 20.

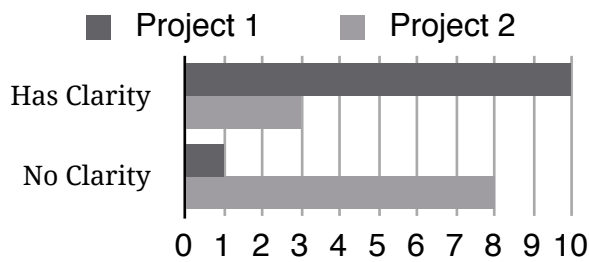


Fig. 20: Distribution of votes according to the personal opinion of the participants.

- **Project 1 (Global Opinion):** 9 out of 11 reported thinking that everyone else would choose the interface that followed the five principles (WAPR1MP) over the interface that lacked of the Clarity principle (WOCL1MP). The remaining 2 participants reported doubt or inability to tell, as it is shown in Fig.21.
- **Project 2 (Global Opinion):** 5 out of 11 reported thinking that everyone else would choose the interface that followed the five principles (WAPR1IT) over the interface that lacked of the Clarity principle (WOCL1IT). 4 participants reported thinking that everyone else would choose otherwise. The remaining 2 participants reported

doubt or inability to tell as it is shown in Fig.21.

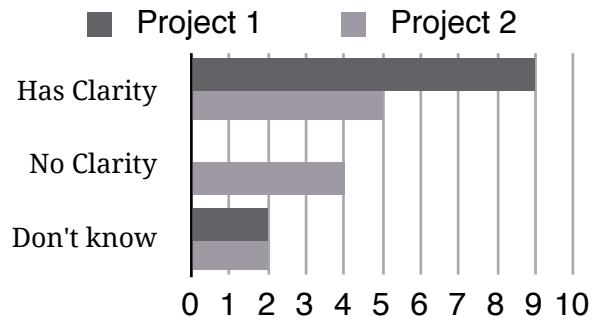


Fig. 21: Distribution of votes according to what the participants thought everyone else would choose (also known as global opinion in this research).

### Consistency

- **Project 1 (Personal Opinion):** As shown in Fig. 22, 8 out of 11 reported personally preferring the interface that followed the five principles (WAPR2MP) over the interface lacking of the Consistency principle (WOCO2MP). 3 preferred otherwise.
- **Project 2 (Personal Opinion):** 9 out of 11 reported personally preferring the interface that followed the five principles (WAPR2IT) over the interface lacking of the Consistency principle (WOCO2IT). 2 preferred otherwise, as it is shown in Fig. 22.

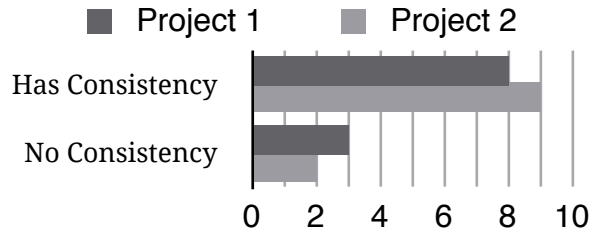
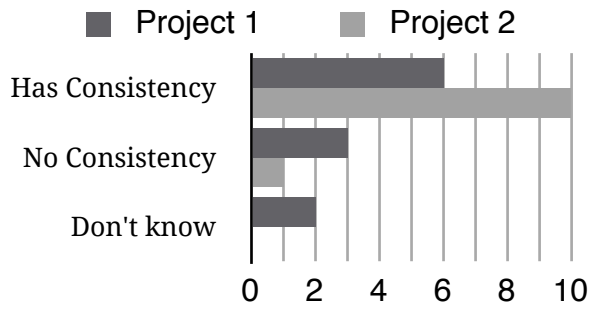


Fig. 22: Distribution of votes according to the personal opinion of the participants.

- **Project 1 (Global Opinion):** As shown in Fig. 23, 6 out of 11 reported thinking that everyone else would choose the interface that followed the five principles (WAPR2MP) over the interface that lacked of the Consistency principle (WOCO2MP). 3 participants reported thinking that everyone else would choose otherwise. The remaining 2 participants reported doubt or inability to tell.
- **Project 2 (Global Opinion):** 10 out of 11 reported thinking that everyone else would choose the interface that followed the five principles (WAPR2IT) over the interface that lacked of the Consistency principle (WOCO2IT). Only 1 participant reported thinking that everyone else

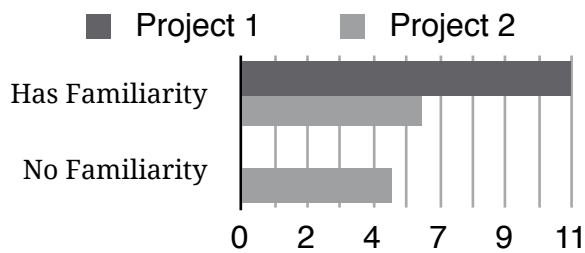
would choose otherwise, as it is shown in *Fig. 23*.



*Fig. 23:* Distribution of votes according to what the participants thought everyone else would choose (also known as global opinion in this research).

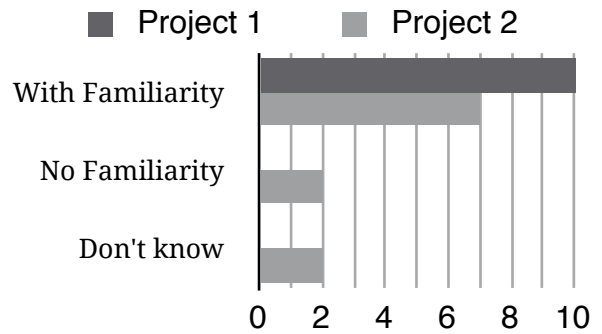
### Familiarity

- **Project 1 (Personal Opinion):** The total amount of participants (11 out of 11) reported personally preferring the interface that followed the five principles (WAPR3MP) over the interface lacking of the Familiarity principle (WOFA3MP).
- **Project 2 (Personal Opinion):** As shown in *Fig.24*, 6 out of 11 reported personally preferring the interface that followed the five principles (WAPR3IT) over the interface lacking of the Familiarity principle (WOFA3IT). 5 preferred otherwise.



*Fig. 24:* Distribution of votes according to the personal opinion of the participants.

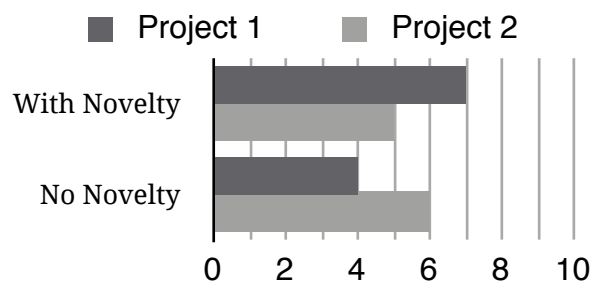
- **Project 1 (Global Opinion):** As shown in *Fig. 25*, the total amount of participants (11 out of 11) reported thinking that everyone else would choose the interface that followed the five principles (WAPR3MP) over the interface that lacked of the Familiarity principle (WOFA3MP).
- **Project 2 (Global Opinion):** 7 out of 11 reported thinking that everyone else would choose the interface that followed the five principles (WAPR3IT) over the interface that lacked of the Familiarity principle (WOFA3IT). 2 participants reported thinking that everyone else would choose otherwise. The remaining 2 participants reported doubt or inability to tell as shown in *Fig. 25*.



*Fig. 25:* Distribution of votes according to what the participants thought everyone else would choose (also known as global opinion in this research).

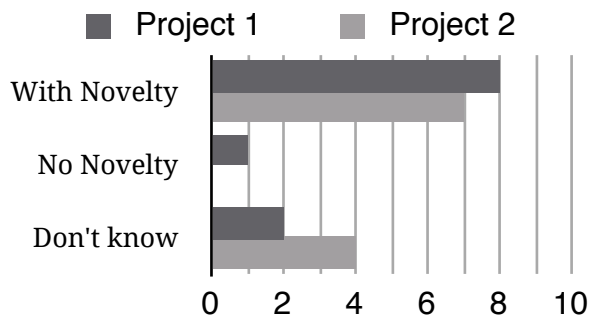
### Novelty

- **Project 1 (Personal Opinion):** As shown in *Fig. 26*, 7 out of 11 reported personally preferring the interface that followed the five principles (WAPR4MP) over the interface lacking of the Novelty principle (WONO4MP). 4 preferred otherwise.
- **Project 2 (Personal Opinion):** 6 out of 11 reported personally preferring the interface that lacked of the Novelty principle (WONO4IT) over the interface following the five principles (WAPR4IT). 5 preferred otherwise.

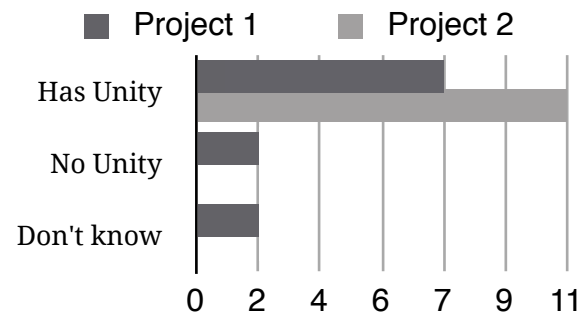


*Fig. 26:* Distribution of votes according to the personal opinion of the participants.

- **Project 1 (Global Opinion):** As shown in *Fig. 27*, 8 out of 11 reported thinking that everyone else would choose the interface that followed the five principles (WAPR4MP) over the interface that lacked of the Novelty principle (WONO4MP). Only one participant reported thinking that everyone else would choose otherwise. The remaining 2 participants reported doubt or inability to tell.
- **Project 2 (Global Opinion):** 7 out of 11 reported thinking that everyone else would choose the interface that followed the five principles (WAPR4IT) over the interface that lacked of the Clarity principle (WONO4IT). The remaining 4 participants reported doubt or inability to tell, as shown in *Fig. 27*.



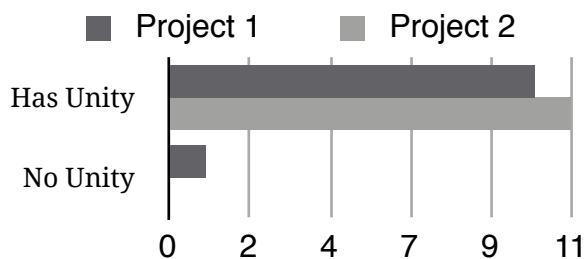
**Fig. 27:** Distribution of votes according to what the participants thought everyone else would choose (also known as global opinion in this research).



**Fig. 29:** Distribution of votes according to what the participants thought everyone else would choose (also known as global opinion in this research).

### Unity

- **Project 1 (Personal Opinion):** As shown in **Fig. 28**, 10 out of 11 reported personally preferring the interface that followed the five principles (WAPR5MP) over the interface lacking of the Unity principle (WOUN5MP). Only one preferred otherwise.
- **Project 2 (Personal Opinion):** The total amount of participants (11 out of 11) reported personally preferring the interface that followed the five principles (WAPR5IT) over the interface lacking of the Unity principle (WOUN5IT).



**Fig. 28:** Distribution of votes according to the personal opinion of the participants.

- **Project 1 (Global Opinion):** As shown in **Fig. 29**, 7 out of 11 reported thinking that everyone else would choose the interface that followed the five principles (WAPR5MP) over the interface that lacked of the Unity principle (WOUN5MP). 2 participants reported thinking that everyone else would choose otherwise. The remaining 2 participants reported doubt or inability to tell.
- **Project 2 (Global Opinion):** The total amount of participants (11 out of 11) reported thinking that everyone else would choose the interface that followed the five principles (WAPR5IT) over the interface that lacked of the Unity principle (WOUN5IT) as it is shown in **Fig. 29**.

### Adjectives

The following section will enlist the adjectives that were assigned at least once to a project.

#### • Adjectives for Project 1:

For project 1, as **Fig. 30** demonstrates, the most assigned adjective by the participants was “simple” (8 times), followed by “stylish” (7 times), and then by “likable” (6 times).

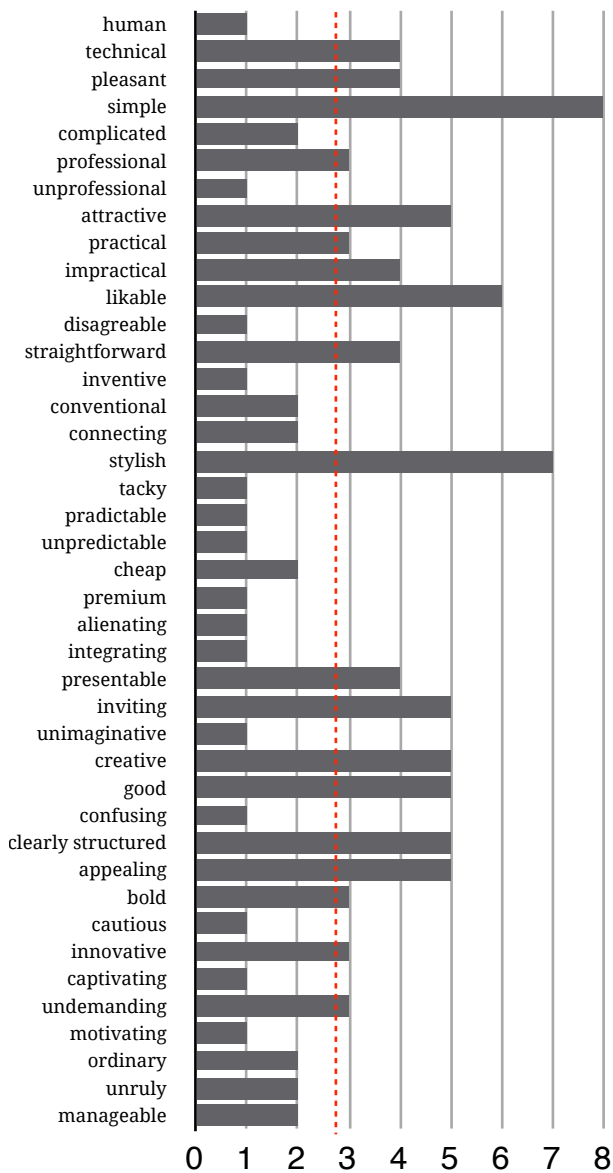
The following adjectives were assigned 5 times each: “attractive, inviting, creative, good, clearly structured and appealing”.

The following list of adjectives were assigned 4 times each: “technical, pleasant, impractical, straightforward and presentable”.

The following list of adjectives were assigned 3 times each: “professional, practical, innovative and undemanding”.

The following list of adjectives were assigned 2 times each: “complicated, conventional, connecting, cheap, ordinary, unruly and manageable”.

The following list of adjectives were assigned only 1 time each: “human, unprofessional, disagreeable, inventive, tacky, predictable, unpredictable, premium, alienating, integrating, unimaginative, confusing, cautious, captivating and motivating” (For a complete chart please read the last part of the chapter Results in the Appendix).



**Fig. 30:** Distribution of votes of adjectives for the interface of project 1: Music Player. Adjectives with less than one vote were eliminated from the chart. The red dotted line represents the mean at 2,804. The chart with the complete results can be found in the Appendix.

**• Adjectives for Project 2:**

For project 2, as Fig. 31 demonstrates, the most assigned adjectives by the participants were “stylish” and “clearly structured” (7 times each), followed by “professional”, ”attractive” and “conventional” (6 times each), and then by “technical”, “straightforward” and “appealing” (5 times each).

The following adjectives were assigned 4 times each: “human, simple, likable, presentable, inviting, creative, motivating and manageable”.

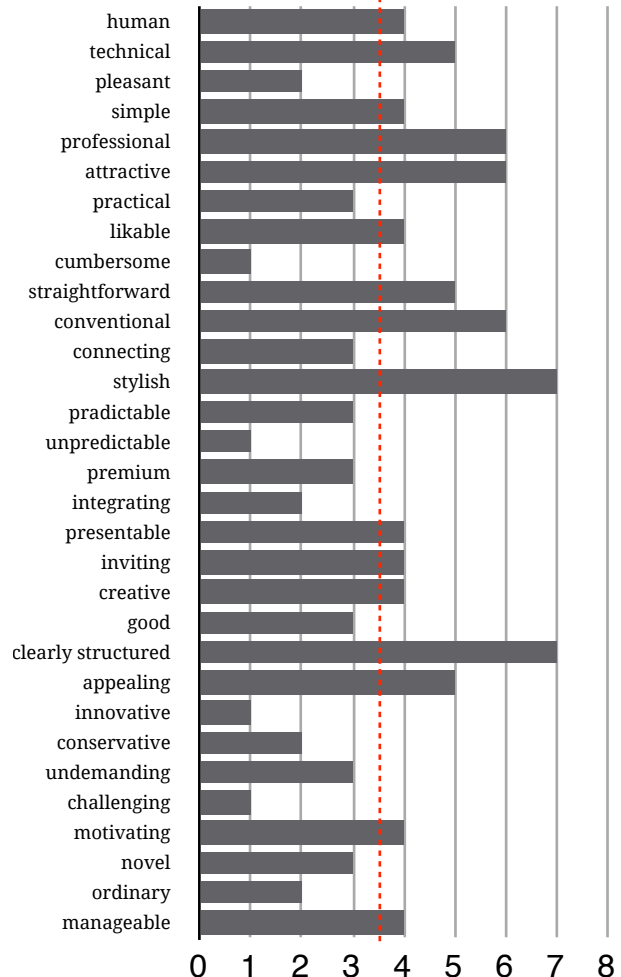
The following list of adjectives were assigned 3 times each: “practical, connecting, predictable, premium, good, undemanding and novel”.

The following list of adjectives were assigned 2

times each: “pleasant, integrating, conservative and ordinary”.

The following list of adjectives were assigned only 1 time each: “cumbersome, unpredictable, innovative and challenging”.

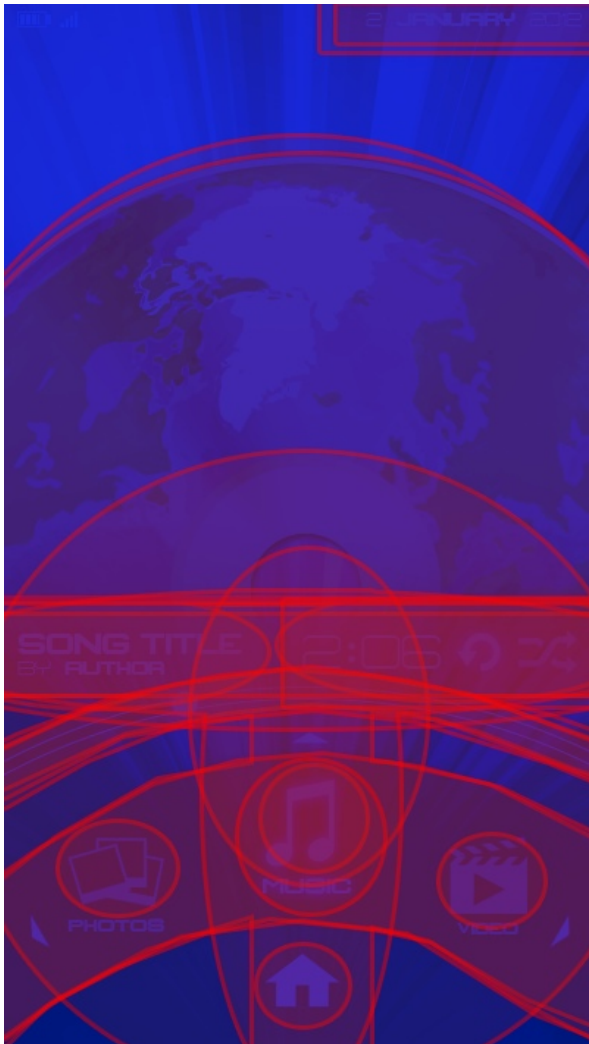
(For a complete chart please read the last part of the chapter Results in the Appendix).



**Fig. 31:** Distribution of votes of adjectives for the interface of project 2: Internet TV. Adjectives with less than one vote were eliminated from the chart. The red dotted line represents the mean at 3,6129. The chart with the complete results can be found in the Appendix.

**• Most highlighted zones for Project 1**

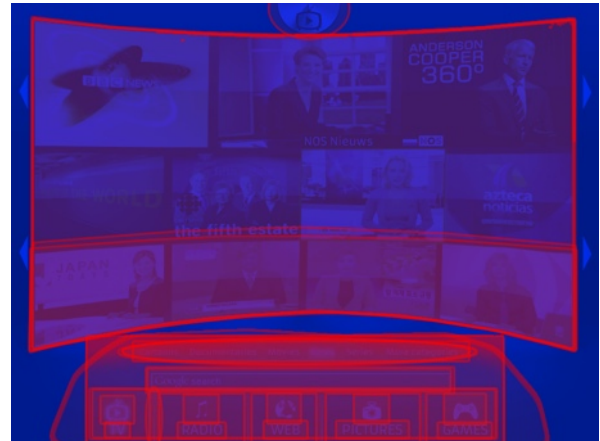
For the last exercise in the experiment, the participants got to highlight the zones that they consider the most beautiful in Project 1: Music Player. Fig. 32 displays a map of the highlighted areas by all the participants.



**Fig. 32:** Distribution of the areas highlighted by the participants. Each highlighted zone has a boundary that delimits the selected area. The boundaries overlap because this is a collective map of all the participants. The redder the area, the more the area was highlighted. The interface background was turned to blue just in this figure to allow the reader to distinguish the areas. The participant saw the interface both in greyscale and colour while performing this exercise.

- **Most highlighted zones for Project 2**

For project 2: Internet TV, the participants repeated the same exercise but with the second interface. The results are displayed in **Fig. 33**.



**Fig. 33:** Distribution of the areas highlighted by the participants. Each highlighted zone has a boundary that delimits the selected area. The boundaries overlap because this is a collective map of all the participants. The redder the area, the more the area was highlighted. The interface background was turned to blue just in this figure to allow the reader to distinguish the areas. The participant saw the interface both in greyscale and colour while performing this exercise.

### Analysis of the Results

All the principles were tested in four different occasions, two on a personal level while the other two on a hypothetical global level. In addition, the participant could assign adjectives at the very end to the interfaces that followed the five principles. After reading the qualitative input of the participants it is possible to find that the experiment had some flaws. We will discuss them and analyze them in the results. The mean which is used *Adjectives* chapter (previous to this one) was calculated in the following way:

$$(\text{Total number of adjectives}) - (\text{Number of adjectives with less than 1 vote}) = X$$

$$(\text{The addition of all the votes}) / X = \text{Mean}$$

**Fig. 31:** Distribution of votes according to what the participants thought everyone else would choose (also known as global opinion in this research). Addition is the collective of all the votes: (e.g. participant A voted for pineapple, participant B voted for pineapple, watermelon and strawberry, participant C voted for strawberry, participant D did not vote for anything. Then the addition of all the votes is 5)



## Analysis of Clarity

The principle of Clarity was tested in question 7 (Music Player) and question 17 (Internet TV) on a personal level, while this same principle was tested in question 27 (Music Player) and 37 (Internet TV) on a hypothetical global level. While there are some problems with the testing method of this principle (see the Discussion chapter for more information). The preference for a clear interfaces was very clear in question 7 (Music Player: Personal) since almost all people preferred the interface that followed the Clarity principle in theory and regardless on whether or not they were considering beauty, usability or both.

Question 17 (Internet TV: personal) however, does not bring as decisive results as question 7; in this question the majority preferred the interface WOCL1IT, which is the one that does not follow the principle of Clarity, at least not in the usability sense. The tags were not clear, but the interface visually speaking is indeed more clear. There is more space and it economizes in several elements. Perhaps WOCL1IT does follow the principle of Clarity and perhaps even better than WAPR1IT. Further scrutiny by the reader may be required to reach a conclusion in this topic.

On the global opinion part of this experiment Clarity again showed a strong trend in question 27 (Music Player: global) and a weak one in question 37 (Internet TV: global) (perhaps because of the same issue). From question 7 and question 27 (Music Player personal and global respectively) we can safely assume that: Not only visual Clarity (fewer elements, more background) is highly representative, but participants also believe that others see it the same way as them (the participants).

In addition the as **Table 1** shows: adjective –simple– ranked the highest in question 47 (Music Player: adjectives) receiving 8 votes out of 11 participants. Meanwhile the adjective –clearly structured– was not far behind with 5 votes out of 11 participants making it among the highest ranking adjectives in Project 1: Music Player.

Selection of adjectives applied to WAPR1MP	
Adjective	Number of Votes
simple	8
clearly structured	5

**Table 1:** Clarity related adjectives applied to the interface WAPR1MP in question 47 (Music Player).

As for Project 2 –simple– got only 4 votes but –clearly structured– was the highest ranking adjective with 7 votes out of 11, or the majority of the participants, as **Table 2** demonstrates. This serves as evidence to demonstrate that the participants did find the two types of clarities in both projects but they weren't uniform in their pondering of considerations. This could be fixed with a 3rd project or by editing the interface WOCL1IT and placing more elements that cover the background. (See future work for more information). The adjectives –simple– and –clearly structured– were highlighted because of their meaning and for being in the same semantic field with the adjective clarity which did not appear in the question.

Selection of adjectives applied to WAPR1IT	
Adjective	Number of Votes
simple	4
clearly structured	7

**Table 2:** Clarity related adjectives applied to the interface WAPR1IT in question 48 (Internet TV).

## Analysis of Consistency

Consistency is perhaps the principle that brought the clearest trends of all. It is highly noticeable in question 9, 19, 29 and 39 (both projects in both levels, personal and global). In all the questions the participants were heavily inclined for what is considered the consistent interface according to the theory in this paper. In question 9 (Music Player: personal), the majority of participants preferred WAPR2MP, in question 19 (Internet TV: personal), again the majority preferred WAPR2IT, in question 29 (Music Player: global), slightly over half of the participants predicted that WAPR2MP would be the preferred interface of anyone else. In question 39 (Internet TV: global), except for 1 participant,

everyone else reported predicting that WAPR2IT would be the preferred choice for anyone else.

Because of all this, it is safe to conclude that Consistency is a highly noticeable aspect of beauty and aesthetics in interfaces. The qualitative comments only reinforce the idea. No adjectives were direct synonyms to the adjective –consistent–. Furthermore, no adjectives could be categorized within the semantic field of the adjective –consistent–. The adjective –consistent– itself did not appear, so there is nothing that can further confirm the existence of the principle of Consistency in this part of the experiment (*please read the discussion chapter for more information about this issue.*)

### Analysis of Familiarity

The principle of Familiarity was tested in the questions 11, 21, 31 and 41 (both projects in both levels, personal and global). Like with the other principles the first two questions were intended for the participant to judge according to his/her opinions, while the later two questions place the participant in a position of predicting which interface would anyone else would choose. WOFA3MP and WOFA3IT not only lacked of the principle of Familiarity, but also the principle of Clarity to some degree. (*See the discussion chapter for more information.*)

question 11 (Music Player: personal) initiated a clear trend. Participants strongly favored WAPR3MP, the one that followed among others, the principle of Familiarity. However in question 21 (Internet TV: personal), the trend was not followed, only 6 in 11 favored WAPR3IT, and while it still is the majority of the participants, it is not as contrasting as in question 11 (Music Player: personal). One would think that variation between the results of both questions should not be as drastic as it is in here. However, after reading the comments on the reasons why the participants opted for one interface over another, it is easy to realize that at least 4 of the 11 participants selected their interface based on the Clarity and not the Familiarity of the interface.

**Table 3** shows that in question 47 (Music Player: adjectives), the participants gave to the interface WAPR1MP: 1 vote for the adjective –human–, 2 votes for the adjective –conventional–, 1 vote for the adjective –predictable–, 1 vote for –cautious–, 3 votes for –undemanding–, 2 votes for –ordinary– and 2 votes for –manageable–.

Selection of adjectives applied to WAPR1MP	
Adjective	Number of Votes
human	1
conventional	1
predictable	1
cautious	1
undemanding	3
ordinary	2
manageable	2

**Table 3:** Familiarity related adjectives applied to the interface WAPR1MP in question 47 (Music Player).

All the mentioned adjectives can in some ways be related to the Familiarity principle, however none of them were really representative of the majority of the participants. Among this selection, only –undemanding– surpasses the mean.

As for question 48 (Internet TV: adjectives), the participants gave to the interface WAPR1IT: 4 votes for the adjective –human–, 6 votes for the adjective –conventional–, 3 voted for the adjective –predictable–, 2 voted for –conservative–, 3 for –undemanding–, 2 for –ordinary– and 4 votes for the adjective –manageable– as **Table 4** demonstrates. The adjective –conventional– received well above the mean while the adjectives –human– and –manageable– received a little more than the mean.

Selection of adjectives applied to WAPR1IT	
Adjective	Number of Votes
human	4
conventional	6
predictable	3
conservative	2
undemanding	3
ordinary	2
manageable	4

**Table 4:** Familiarity related adjectives applied to the interface WAPR1IT in question 48 (Internet TV).

This indicates that the participant found the interface to look somewhat familiar, or at least some of its elements.

### Analysis of Novelty

Novelty as a principle presents an interesting story. Novelty as a principle was tested in questions 13, 23, 33 and 43 (both projects in both levels, personal and global). The reason why is interesting is because while the participants demonstrated in question 13 (Music Player: personal) a slight favor for the interface that follows the principle of Novelty (WAPR4MP) with 7 out of 11 preferring the interface that follows the principle in question. In question 23 (Internet TV: personal) the participants demonstrated preference for the interface that did not follow the principle of Novelty. 6 out of 11 preferring interface WONO4IT over WAPR4IT, again a slight tendency, but this time opposite to what was found in question 13 (Music Player: personal).

To add further interest to this results, the participants strongly predicted in question 33 and 43 (Music Player and Internet TV: global, respectively) that the global opinion would most likely be in favor of the interfaces that follow the principle of Novelty (WAPR4MP and WAPR4IT). In other words; the participants would generally be in disagreement between their personal opinion and their predictions about the interfaces following the principle of Novelty. In question 33 (Music Player: global), almost everyone predicted that everyone else would prefer WAPR4MP over WONO4MP. Only participant 1 disagreed by predicting otherwise. The remaining 2 participants concluded that they do not know or that they are unable to tell.

In question 43 (Internet TV: global), the contrast is just as prominent with the great majority, or to be exact 7 participants predicting that everyone else would prefer WAPR4IT over WONO4IT and the remaining 4 stating that they were unable to tell or simply did not know.

Of the adjectives applied in question 47 (Music Player: adjectives) to the interface WAPR1MP, the ones related to Novelty were: 1 vote for the adjective –inventive–, 1 vote for the adjective –unpredictable–, 5 votes for –creative–, 3 votes for –bold–, 3 votes for –innovative–, and 2 votes for –unruly– as the **Table 5** lists.

Selection of adjectives applied to WAPR1MP	
Adjective	Number of Votes
inventive	1
unpredictable	1
creative	5
bold	3
innovative	3
unruly	2

**Table 5:** Novelty related adjectives applied to the interface WAPR1MP in question 47 (Music Player).

As for question 48 (Internet TV: adjectives) to the interface WAPR1IT: 1 vote for the adjective –unpredictable–, 4 votes for the adjective –creative–, 1 for –innovative– and 3 for –novel– as the **Table 6** shows.

Selection of adjectives applied to WAPR1IT	
Adjective	Number of Votes
unpredictable	1
creative	4
innovative	1
novel	3

**Table 6:** Novelty related adjectives applied to the interface WAPR1IT in question 48 (Internet TV).

Of the adjectives presented creative was both on the mean or above the mean in both questions 47 and 48 (Music Player and Internet TV: adjectives, respectively).

### Analysis of Unity

The principle of Unity was tested in questions 15, 25, 35 and 45 (Music Player and Internet TV: personal and global, respectively). Like Consistency, the principle of Unity proved to be easy to detect and highly appreciated among the participants. In question 15 (Music Player: personal), almost every participant considered WAP5MP more beautiful than WOUN5MP. In question 25 (Internet TV: global), everyone considered WAPR5IT more beautiful than WOUN5IT. In question 35 (Music Player: global), and unlike the Novelty principle, their prediction of which interface would be considered more beautiful

by everyone else was somewhat consistent with their preferences, since 7 out of 11 participants predicted that WAPR5MP would be perceived as more beautiful by everyone else. Only 2 predicted otherwise, and the other 2 could not tell or did not know.

In question 45 (Internet TV: global) the prediction is very evident again. Every single participant predicted that WAPR5IT, the interface that follows the Unity principle according to the theory in this paper, would be considered the most beautiful by everyone else. As the **Table 7** lists: for the adjectives in question 47 (Music Player: adjectives) connecting received 2 votes and integrating received 1 vote, none of those above in the mean. The adjectives were again selected because of their meaning and their semantic relation with the principle in question.

Selection of adjectives applied to WAPR1MP	
Adjective	Number of Votes
connecting	2
integrating	1

**Table 7:** Unity related adjectives applied to the interface WAPR1MP in question 47 (Music Player).

In question 48 (Internet TV: adjectives) connecting received 3 votes and integrating 2 votes as it can be seen in **Table 8**. None above the mean.

Selection of adjectives applied to WAPR1IT	
Adjective	Number of Votes
connecting	3
integrating	2

**Table 8:** Unity related adjectives applied to the interface WAPR1IT in question 48 (Internet TV).

### Analysis of the highlighted areas

The participants in both Project 1: Music Player and Project 2: Internet TV placed great emphasis in the menu of each interface as it was shown in **Fig. 32**. It is possible to appreciate the degree of emphasis that was put in Project 1: Music Player. The reddest zone appears to be in the middle-lower zone of the interface where the song title and timer appears. In addition, the curved menu in the lower part of the interface gained a great degree of attention as well.

**Fig. 34** presents the same map as in **Fig. 32** but with the boundaries of the highlighted areas blurred. This is meant to provide a better understanding of the attention points by the participants. Unsurprisingly, Project 2: Internet TV followed the same pattern, demonstrating again that the main attention focus was located in the menu as **Fig. 35** demonstrates.



**Fig. 34:** Distribution of the areas highlighted by the participants. The boundaries of each highlighted area have been blurred to provide a better understanding of the focus areas. The redder the area, the more highlights it got by the participants. The interface has been turned blue to create contrast and a clearer visualization.



**Fig. 35:** *Distribution of the areas highlighted by the participants. The boundaries of each highlighted area have been blurred to provide a better understanding of the focus areas. The redder the area, the more highlights it got by the participants. The interface has been turned blue to create contrast and a clearer visualization.*

### Discussion

The experiment contains the risk of creating a bias in the selection of interfaces by the user. If an interface resembles in style to the style of a popular brand. (e.g. An interface that presents the mail page of a smartphone could lead the user find relationship to the mail screen of Google's Android or Apple's iOS if he or she has had the opportunity to use it before); If this happens, it is possible to create a bias in the user ergo affecting his/her results to one selection or another. The interfaces were designed to not resemble in any way the actual interfaces that are in the market. (See the Questionnaire chapter in the Appendix to find the complete list of interfaces presented to the user).

This research has an exploratory nature. The experiment is not aimed at finding whether or not beauty can be measured in every single representation of it. In other words this research is limited uniquely to visual aesthetics in graphical user interfaces. I does not address other possible manifestations of beauty in music, art, etc. While beauty in art was vaguely explored in this research; it is not possible to conclude that the results or the methodology of this experiment could also apply to beauty in art. The reason why beauty in art was explored in this research was because of its graphical nature which is a parallel to interface design. Art, at least as far a this research is concerned is strictly defined and limited to visual art. Furthermore the experiment is aimed to address visual user interfaces that can be displayed in a

computer screen such as a music player or an internet television just to mention some examples.

The material presented in the principle of Clarity in question 7 and question 17 has a possible flaw: The interfaces in those questions could be interpreted as having different purposes. WOCL1MP presented a rich text that saturated the interface while WAPR1MP did not feature this element at all. While it is true that this experiment is designed to judge beauty, several participants demonstrated judging usability aspects rather than aesthetic aspects of the interface. This was very evident due to the the open question in this part. In addition Clarity may be understood in two ways: Clarity as in the degree of clearness of elements in an interface (e.g. Fewer and smaller elements leave a freer background making an interface clearer) or as how clear and understandable each button and its function is, which is more usability-related. Nevertheless it can still be considered within the beauty realm. question 7 was more oriented to the first one while question 17 was more oriented to the later one. The participants judged with a different mindset. According to the qualitative answers given, there is a mix of both in both questions and future work may be required to address the clarity principle. Nevertheless users showed to be extremely sensitive to Clarity at least in Project 1. Furthermore their opinion does not change even if they have to think about everyone else.

At least two participants reported difficulty separating the appreciation of beauty with the appreciation of usability after taking the experiment.

The uniformity of the backgrounds of the participants could have had produced biased results. All the participants were highly educated and 10 out of 11 were studying a higher degree than the one they already obtained. All of them were in some way related to the University of Twente which happens to be technical institution. However not all of them had technical backgrounds.

The principle of Familiarity is directly tied with the principle of Clarity in questions 11, 21, 31 and 41. Visually speaking it was impossible to separate them. WOFA3MP and WOFA3IT not only lacked of the principle of Familiarity, but also the principle of Clarity itself due to the lack of name-tags in the buttons. Clarity (as in understandability) and Familiarity proved to be tied in both design projects.

## Conclusion

The principles in question may play a role in the appreciation of beauty, since they can be perceived by the participants. It is after all, clear that they create trends in the participants preferences. Not all principles proved consistent results (like Novelty), and it is likely that other principles of beauty are present but weren't analyzed in this research.

We can conclude from the analysis of each principle many things. First, that our participants were highly sensitive whenever the Consistency and Unity principle were broken. Small changes in the visual aspect of the interface, (specially in the menu items) that rendered it inconsistent or not unified would cause instant rejection in most of our participants. We also learned that for Novelty preferences are not as clear as they may seem. Overall the participants preferred interfaces that weren't that novel, yet most of them would predict against their personal preference.

Some of the principles of usability and beauty are shared and their characteristics complement each other. Clarity was highly perceived by the participant. At least two types of clarities exists, and while both address aspect of beauty and usability, one is more related to the understandability aspects of an interface (such as conceptual clarity of each button) while the other to the visual clearness (like having blank spaces as a visual resting point). There is no universal vocabulary for beauty but there are adjectives that can aid future research in the subject. It is for this reason that leaving an opportunity for the participant to express his appreciation of beauty with his/her own words is recommended for a research of this nature.

## Future Work

Experience of Usability versus Experience of Beauty: Where does beauty start and where does usability end? This was a prominent problem among the participants of the experiments with technical background.

The principle of Clarity can be tested further by intentionally separating the two types of clarities described in the analysis and discussion chapters.

In addition, the experiment can be perfected and the adjectives could be applied in a 7 scale point in a semantic diferential style, like it is possible to find in *AttrakDiff by Hassenzahl, Burmester and Koller* (2003).

The principle of Novelty itself deserves special attention because of its nature; an interesting finding in this research was that the participants were either equally divided whenever it comes to prefer a Novel interface. However, if they had to predict what everyone else would find more beautiful, the participants found the interfaces that followed the principle of Novelty as the more likely to be liked by the global audience. It would be worth improving this experiment by considering the observations in the discussion chapter.

## Acknowledgments

Special thanks to the Dr. Betsy van Dijk of the Human Media Interaction department of the University of Twente, for her guidance, patience and effort to make this a high quality research, without her, this research wouldn't have been possible. Also to Dr. Gijs Huisman for reviewing the overall research and providing some guidance in the production of the experiment. Dr. Jan Schut, and the University of Twente's scholarship department, for providing the opportunity and the means to initiate this research in the Human Media Interaction field. The University of Twente for providing space and programme that created the perfect conditions for the realization of this research.

## References

- Alexa. (2011, September 19). *Google.com*. Retrieved from <http://www.alexacom/siteinfo/google.com>
- Ben-Bassat, T., Meyer, J., & Tractinsky, N. (2006). *Economic and subjective measures of the perceived value of aesthetics and usability*. Manuscript submitted for publication, Department of Industrial Engineering and Management and Department of Information Systems Engineering, Ben Gurion University of the Negev, Israel. Retrieved from <http://courses.ischool.berkeley.edu/i290-20/s09/wp-content/themes/blueprint/images/p210-ben-bassat.pdf>
- Balling, J. D. & J. H. Falk. (1982). "Development of visual preference for natural environments." *Environment and Behavior* 14:5-28. Retrieved from [http://www.ideal.forestry.ubc.ca/frst524/04\\_BallingFalk.pdf](http://www.ideal.forestry.ubc.ca/frst524/04_BallingFalk.pdf)
- Bloch, P. H., Brunel, F. F., & Arnold, T. J. (2003). Individual Differences in the Centrality of Visual Product

- Aesthetics: Concept and Measurement. *Journal of Consumer Research*, 29(4), 551-565. Retrieved from EBSCOhost.
- Darwin, C. (1859). *The origin of species*. London, United Kingdom: John Murray. Retrieved from <http://darwin-online.org.uk/content/frameset?itemID=F373&viewtype=side&pageseq=2>
  - Dutton, D. (2010a). *Art instinct*. (illustrated ed., p. 304). Oxford University Press. Retrieved from <http://books.google.com/books/feeds/volumes?q=9780199580736>
  - Dutton, D. (Writer). (2010b, February). A darwinian theory of beauty [Video podcast]. *TED*. Retrieved from [http://www.ted.com/talks/lang/eng/denis\\_dutton\\_a\\_darwinian\\_theory\\_of\\_beauty.html](http://www.ted.com/talks/lang/eng/denis_dutton_a_darwinian_theory_of_beauty.html)
  - Hassenzahl, M., Burmester, M., & Koller, F. (2003). AttrakDiff: Ein Fragebogen zur Messung wahrgenommener hedonischer und pragmatischer Qualität [AttracDiff: A questionnaire to measure perceived hedonic and pragmatic quality]. In J. Ziegler & G. Szwillus (Eds.), *Mensch & Computer 2003. Interaktion in Bewegung* (pp. 187-196). Stuttgart, Leipzig: B.G. Teubner.
  - Hollins, B., & Pugh, S. (1990). *Successful product design: what to do and when*. (illustrated ed., p. 167). Butterworths
  - Iyengar, S. S., & Lepper, M. R. (2000). When choice is demotivating: Can one desire too much of a good thing?. *Journal Of Personality And Social Psychology*, 79(6), 995-1006. doi: 10.1037/0022-3514.79.6.995
  - Koffka, K. (1999). *Principles of gestalt psychology*. (reprint ed., p. 732). Routledge. Retrieved from <http://books.google.com/books/feeds/volumes?q=0415209625>
  - Lavie, T., Tractinsky, N. (2003). *Assessing dimensions of perceived visual aesthetics of web sites*. Manuscript submitted for publication, Department of Industrial Engineering and Management and Department of Information Systems Engineering, University of the Negev, Beer Sheva, Israel. Retrieved from <http://www.sciencedirect.com/science/article/pii/S1071581903001642>
  - Norman, O. A. (2002). *The design of everyday things*. (illustrated ed., p. 257). Basic Books. Retrieved from <http://books.google.com/books/feeds/volumes?q=9780465067107>
  - Oxford Dictionaries. (2010). *Aesthetics*. Oxford University Press. Retrieved from <http://oxforddictionaries.com/definition/aesthetics>
  - Oxford Dictionaries. (2010a). *Beauty*. Oxford University Press. Retrieved from <http://oxforddictionaries.com/definition/aesthetics?q=aesthetics>
  - Oxford Dictionaries. (2010b). *Beauty*. Oxford University Press. Retrieved from <http://oxforddictionaries.com/definition/beauty>
  - Papachristos, E., & Avouris, N. (2011). *Are first impressions about websites only related to visual appeal?*. Manuscript submitted for publication, Electrical and Computer Eng. Dept., University of Patras, Patras, Greece. Retrieved from <http://www.springerlink.com/content/a787pn527t17t658/abstract/>
  - Seymour, R. (2011). *How beauty feels* [Web]. Retrieved from [http://www.ted.com/talks/richard\\_seymour\\_how\\_beauty\\_feels.html](http://www.ted.com/talks/richard_seymour_how_beauty_feels.html)
  - Van Gogh, V. (Artist). (1889). *Starry night* [Illustration]. Retrieved from <http://www.googleartproject.com/museums/moma/the-starry-night>

# Appendix

## Extended procedure description

### • Before taking the experiment

**Description:** The participants were invited to take place in the experiment. In order to be part of the experiment the participant had to agree and sign a consent form where he/she agrees with the use and collection of information for the purpose of this research among other terms. (*The consent form has been added to the Appendix for further information.*) The participant was then asked to go inside the room where the experiment took place. A series of personal questions were presented to the participant in order to understand to what demographical group he/she belonged. The questions asked in this part of the experiment could identify the following characteristics of the participants:

- Gender
- Age group
- Highest level of completed education
- If the participant was studying for a higher level at the time the experiment took place
- If the participant had any previous formal visual design education or experience

### • Task 1.1

**Description:** Two static interfaces were presented to the participant. The interfaces were supposed to be judged by the participant according to which one they consider more beautiful. The participant always had the possibility to make a choice between two options. At this point it's worth noting that in the visual design industry presenting two or more options to a client is a common practice among designers. There is a number of reasons why two or three options is the recommended number of options for a designer to present to its client. One reason that could probably stand out is, to avoid overwhelming the customer with too many options, and therefore affecting his/her feeling of satisfaction with the work that it is being done. *Iyengar & Lepper (2000)* explain better how a vast array of options can overwhelm and indeed create a feeling of dissatisfaction in the user or client in this case. It is for this reason that we have decided to limit the choices to two at a time).

The participant produced a judgement about beauty. The interfaces differed slightly visually. In

addition, a purpose for the interface was presented to the participant so the two interfaces presented fitted within the same context (e.g. If the purpose of the interface was to enable the user to dial a number for a phone call, then two different yet visually related interfaces were presented with the same purpose and the same or similar elements). This step was repeated for each proposed principle and for both project 1 and 2. In other words this step was repeated 10 times. The participant made a choice between one of the two interfaces in each case according to the following question "*Which interface is more beautiful?*". The interfaces presented consisted of:

- An interface that followed all the five proposed principles (not always on the left-side): Clarity, Consistency, Familiarity, Novelty and Unity.
- An interface that did not follow one of the principles but followed the other four (not always in the right side).

**Question:** Which interface is more beautiful?

**Possible answer:** Either interface A or interface B (both code-named: *see the "Code Naming of the Interfaces" chapter for more information*) without being able to select both simultaneously. Filling this result was of mandatory nature.

**Rationale:** This question was intended to address if the principles explained in the theory actually play a role in the aesthetics of an interface.

**Result:** The result should have answered, whether or not the principles presented were noticeable by the participant.

### • Task 1.2

**Description:** A text box was presented where the participant was able to describe with his own words why he/she considered one interface superior from another. The text box was presented right after the elements of task 1.1, and every time task 1.1 had to be repeated. The elements of task 1.1 and 1.2 were placed in the same page.

**Question:** Why do you consider your selected interface more beautiful than the other?

**Possible answers:** The possible answers were always textual, and it was not mandatory for the participant to fill this space.

**Rationale:** This step is a qualitative element in the experiment. It is merely there to find possible adjectives that could be used for future research. If trends are found within this part they should show



in the results.

**Results:** The results of this task were intended to be used to understand the reasons of why the participant opted for one option over another. They also worked to find anomalies in the test.

- **Task 2.1**

**Description:** After judging all the possible combinations of task 1.1 (10 in total) of the two design projects, according to the participant's personal perspective, the participant was asked again over the same interfaces presented in task 1.1 but now the question was intended to place the participant in a situation where he/she had to judge according to everyone else.

**Question:** Which interface do think everyone else would consider more beautiful?

**Possible answers:** Either interface A or interface B (again code-named both: see the "Code Naming of the Interfaces" chapter for more information) without being able to select both simultaneously. Unlike Task 1.1 an extra option was added to allow the participant to maintain a neutral position in this step. The Don't know / Can't tell allowed the participant to not take a position in the presented options. Filling this result was mandatory.

**Rationale:** We believe there is a difference if the participant has to position himself or herself in a personal judgement versus a judgement for everyone else's opinion or global opinion. This task was intended to address if the opinion of the participant changed when he/she had to think for a larger group rather than himself or herself.

**Result:** The result on this task was intended to be able to address if the judgement of beauty in the participant experiences any change, by making the participant to think for everyone else rather than only for himself or herself.

- **Task 2.2**

**Description:** A text box was presented where the participant was able to describe with his own words why he/she considered one interface superior from another and/or justify why he/she believes or does not believe why his opinion is shared among everyone else. The text box was presented right after the elements of task 2.1. The elements of task 2.1 and 2.2 were placed in the same page.

**Question:** Why do consider that anyone else would find the selected interface more beautiful

than the other?

**Possible answers:** A text box was presented where the participant was able to express the reasons behind his/her choice. The possible answers were always textual and like task 1.2 the participant was not obligated to fill this field in order to proceed to the next step.

**Rationale:** This step is yet another qualitative element in the experiment. It is merely there to find possible adjectives that could be used for future research. If trends are found within this part they should show in the results.

**Results:** The results were intended to be used only if clear trends can be found in this step. Or to report irregularities in the reasoning of the participant's answers. In other words, this step gives us additional information regarding why did our participants choose one interface over another.

- **Task 3.1**

**Description:** A series of adjectives were presented to the participant. The adjectives presented to the participant were based on the *Attrakdiff Questionnaire by Hassenzahl, Burmester and Koller (2003)*. The participant then was able to judge which adjectives applied to the interface that follows the five proposed principles according to the theory in Project 1 (Music Player). An image of Project 1 (Music Player) that follows the five proposed principles was placed for the participant to have some visual context of what the question is about.

**Question:** Please checkmark the words that in your opinion apply to the current interface.

**Possible answers:** A series of adjectives were presented to the participant. The adjectives were: "Human, Technical, Pleasant, Unpleasant, Simple, Complicated, Professional, Unprofessional, Ugly, Attractive, Practical, Impractical, Likable, Disagreeable, Cumbersome, Straightforward, Inventive, Conventional, Isolating, Connecting, Stylish, Tacky, Predictable, Unpredictable, Cheap, Premium, Alienating, Integrating, Unpresentable, Presentable, Rejecting, Inviting, Unimaginative, Creative, Good, Bad, Confusing, Clearly Structured, Repelling, Appealing, Bold, Cautious, Innovative, Conservative, Dull, Captivating, Undemanding, Challenging, Motivating, Discouraging, Novel, Ordinary, Unruly, Manageable". This is a multiple choice answer. The participant could answer with one or more adjectives. At least one adjective had

to be assigned in order to proceed to the next step.

**Rationale:** We wanted to further analyze how the participant perceived the interfaces with all the principles in play. Yet we did not want to get results that may differ vastly and end up with a set of answers that are impossible to analyze. For this reason we have decided to limit the adjectives to a determined list and *AttrakDiff's* adjectives by *Hassenzahl, Burmester and Koller (2003)*. Not all adjectives were used. The order of the list was randomized, so each time a participant got to this part of the experiment, the order of the adjectives would be different.

**Results:** The participants can define a trend describing the interfaces. Since there is no universal vocabulary for beauty, we will need to limit the list to a number of adjectives that can render a trend.

- **Task 3.2**

**Description:** Task 3.2 was repeated in the exact same way as Task 3.1, except that, instead of including an image of Project 1 (Music Player), an image of Project 2 (Internet TV) was placed. Task 3.1 and 3.2 share the same information and method. (*For more information please read the earlier chapter*).

- **Task 4 and Aftermath**

**Description:** The participant was asked to open the enclosed envelope (a physical envelope) containing two documents. A projection of the two interfaces that follow the five principles in the theory were presented underneath the following message: "Almost done! (please don't close this window)

Under this keyboard there is an envelope containing a couple of documents. A marker has been given to you to perform this last part of the experiment.

In this part of the experiment you will need to highlight the area or areas that you find the most beautiful in the interface.

Thank you for lending us some of your time by being part of this experiment."

**Contents:** The participant found two pages size A4 each one with one interface printed on it. The two interfaces printed were the interfaces that followed the 5 proposed principles according to the theory in this research. Each page contained one interface. The user was asked to highlight the areas he/she found the most beautiful.

**Question:** Highlight the area or areas that you find the most beautiful in the interface.

**Possible answers:** The participant may have circled or framed none, one, more than one area or the whole interface.

**Rationale:** This step was meant to focus on the elements that the participant focused on. It goes beyond the broad question "Which interface is more beautiful?" it allows the participant to explain why he/she liked the presented interfaces in a graphical way, without having to describe it with words. The selection of the interfaces was limited just to the project that fulfilled all the principles in order to make the experiment reasonable on time.

**Results:** With the information of multiple participants, it may be possible to generate heat maps that determine what were the elements that made a given interface aesthetically beautiful.

## Consent Form

Please consider the information presented in this document carefully. Take as much time as you need to read it all and understand every section in this document before deciding whether to participate in this research.

Purpose of the research: To examine the perception of beauty in elements of graphical user interfaces.

What will you (the participant) do in this research: You will observe a series of images and a question will be presented. You will be asked to answer according to your perception, intuition or knowledge or what you consider best suited.

Time required: Participation will take approximately 30 minutes or more to complete.

Risks: The effects of participating should be comparable to those you would experience from viewing a computer monitor for 30 minutes and using a mouse, keyboard and a marker. There are no expected risks associated with the participation in this study. A sweet may or may not be given at the end of the experiment, we are not responsible of how you decide to use it or the effects that may cause in your body.

Benefits: Upon your request we will provide you with a thorough explanation of the study and our hypothesis. We also intend to describe you the implications of the results only upon your request. You may request a copy of our manuscripts (summaries of our results or details of our experiment) by sending an email message to [g.u.sepulveda@student.utwente.nl](mailto:g.u.sepulveda@student.utwente.nl) to Gilberto Sepulveda. The final version of the research will be published in <http://www.gilfolio.com/research/> in the last week of February of 2012, unless unexpected restrictions arise. There is however no guarantee that the document will be left online free to be downloaded indefinitely.

Compensation: No compensation will be awarded to you for participating in this study. You may or may not receive a sweet at the end of this experiment in a symbol of gratitude for your participation.

Privacy: Your participation in this study will remain confidential and there will be no link between your responses and your identity will be recorded. You will answer as an anonymous participant, unless you decide to reveal your identity in the recorded answers.

Participation and withdrawal: Your participation in this study is completely voluntary, and you may withdraw at any time without penalty. You may withdraw by informing the researcher that you no longer wish to participate (no questions will be asked).

Contact Researchers: If you have questions about this research, please contact Gilberto Sepulveda [g.u.sepulveda@student.utwente.nl](mailto:g.u.sepulveda@student.utwente.nl) +31(0) 62671 4946.

Whom to contact about your rights in this research: for questions, concerns, suggestions, complaints that are not being addressed by the research team, or in case of research-related harm: Dr. Betsy van Dijk [bvdijk@ewi.utwente.nl](mailto:bvdijk@ewi.utwente.nl) supervisor of this research.

Agreement:

The nature and purpose of this research have been sufficiently explained and I agree to participate in this study. I understand that I am free to withdraw at any time without incurring any penalty.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name (print): \_\_\_\_\_

## Questionnaire

The following section will list the questionnaire as it was applied in the experiment. The questions marked with an asterisk (\*) required an answer. Although it is not shown in the appendix the user saw an actual asterisk at the end of every required question. The items or words in between brackets and in italic ( *example* ) never appeared in the questionnaire, but they were added in this paper for organizational purposes. The participant always had the opportunity to press the forward by pressing the (Next >>) button, or going back by pressing the (<< Back) button. The participant could only go to the next page by filling every required answer in the displayed page. If the participant did not fill a required question the following message would appear:

“Please check that you have completed all the required questions.

Your answers have not been saved.”

The questionnaire consisted of 26 pages, the first one being the introduction requiring the participant to read and sign the consent form. In addition a conclusion page was added at the end of the questionnaire, giving the instructions to the participant on what to do after finishing the questionnaire.

The answer of each of the questions were listed and separated by comas (.). The order of the possible answers appeared exactly as this report states.

A progress bar was shown at all times along with a page numerator for the user to be able to know where was he/she in the questionnaire.

[-----]

### Page 1/26

Welcome!

First and foremost, thank you for lending us some of your time by taking part in this experiment. Over your keyboard you might have found a consent form along with a copy (this last one for you to keep). In order to take part in this experiment you must read the consent form carefully and sign it. If you have any doubts feel free to open the door behind you and ask for help. An assistant will be there at all times to help you on your request.

In this experiment you will be answering several questions about beauty in Graphical User Interfaces. There is no wrong answer in this test. Every single answer that you record during this experiment will be processed with care. What is important is that you express yourself as much as you can.

Thank you again for taking part in this experiment.

[*Question 1\**] Participant agreement

[*Question 1\*: Possible Answer*] I have read the Consent Form completely and I agree with all the statements in it. I have signed it with my name date and signature.

[-----]

### Page 2/26

Please tell us about you

In order to better understand aesthetics and their role in perception we need to know a little bit more about yourself.

[*Question 2\**] What is your gender?

[*Question 2\*: Possible Answers*] Female, Male, Other, Prefer not to disclose.

[*Question 3\**] What is your current age?

[Question 3\*: Possible Answers] 18-21, 22-25, 26-30, 31-40, 41-50, 51-60, 61 or more, Prefer not to disclose.

[Question 4\*] What is the highest level of education you have completed?

[Question 4\*: Possible Answers] VMBO, HAVO, VWO, MBO, HBO, WO, High School, Bachelor's degree (BA BS etc.) - 2 years, Bachelor's degree (BA BS etc.) - 4 years, Master's degree (MA MSc MS etc.), PhD, Prefer not to disclose.

[Question 5\*] Are you currently studying in a higher level than the one you stated above?

[Question 5\*: Possible Answers] Yes, No, Not Applicable / Prefer not to disclose.

[Question 6\*] Have you ever had any formal Visual Design / Graphic Design related education or experience? (Example: Interface Design, Brand Design, Illustration, etc.)

[Question 6\*: Possible Answers] Yes, No, Unsure.

[-----]

**Page 3/26**

Section 1

In this section you will be asked about the beauty of a series of similar interfaces for a Digital Music Player for a portable device.

The questions marked with an Asterisk (\*) must be answered. You may leave empty the rest. However this will limit our understanding of your choices.

[-----]

**Page 4/26**

This interface is intended for a digital music player for a portable device.

[Question 7\*] Which interface is more beautiful?



Interface WAPR1MP



Interface WOCL1MP

[Question 7\*: Possible Answers] Interface WAPR1MP, Interface WOCL1MP.

[Question 8] Why do consider your selected interface more beautiful than the other?

[Question 8: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 5/26

[Question 9\*] Which interface is more beautiful?



Interface WOCO2MP



Interface WAPR2MP

[Question 9\*: Possible Answers] Interface WOCO2MP, Interface WAPR2MP.

[Question 10] Why do consider your selected interface more beautiful than the other?

[Question 10: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 6/26

[Question 11\*] Which interface is more beautiful?

[Question 11\*: Possible Answers] Interface WOFA3MP, Interface WAPR3MP.

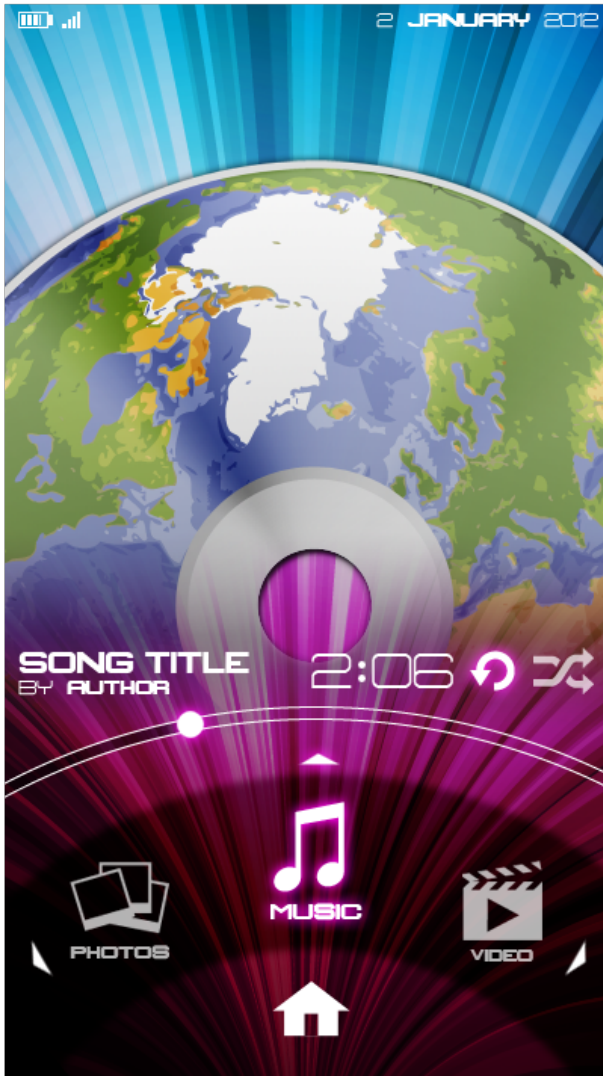
[Question 12] Why do consider your selected interface more beautiful than the other?

[Question 12: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

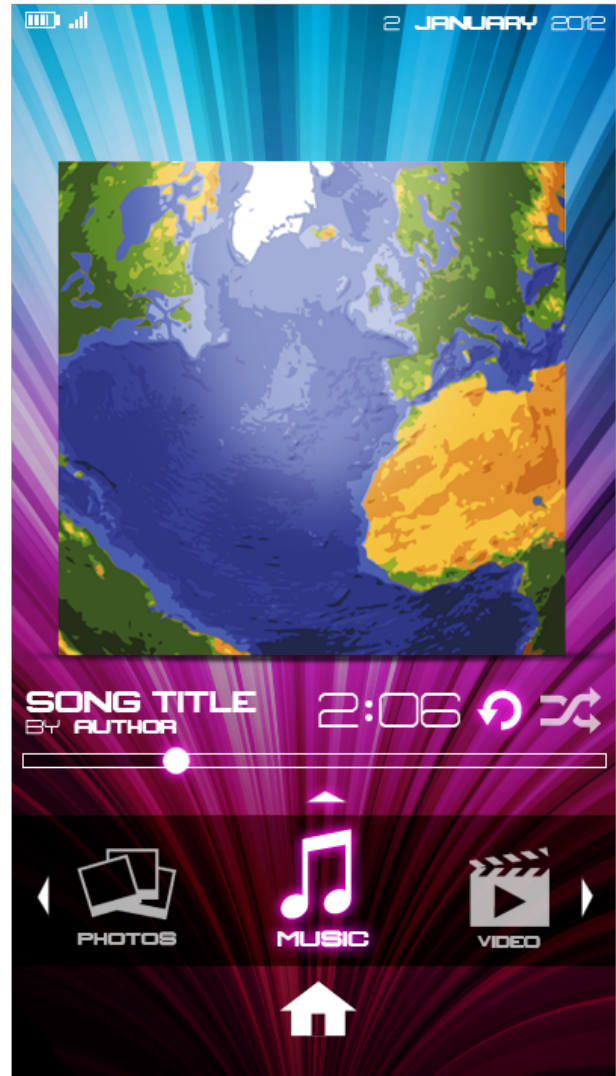
[-----]

Page 7/26

[Question 13\*] Which interface is more beautiful?



Interface WAPR4MP



Interface WONO4MP

[Question 13\*: Possible Answers] Interface WAPR4MP, Interface WONO4MP.

[Question 14] Why do consider your selected interface more beautiful than the other?

[Question 14: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 8/26

[Question 15\*] Which interface is more beautiful?





Interface WAPR5MP



Interface WOUN5MP

[Question 15\*: Possible Answers] Interface WAPR5MP, Interface WOUN5MP.

[Question 16] Why do consider your selected interface more beautiful than the other?

[Question 16: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

**Page 9/26**

Section 2

In this section you will be asked about the beauty of a series of similar interfaces for a Smart Internet TV.

[-----]

**Page 10/26**

This interface is intended for a digital music player for a Smart Internet TV.

[Question 17\*] Which interface is more beautiful?



Interface WOCL1IT



Interface WAPR1IT

[Question 17\*: Possible Answers] Interface WOCL1IT, Interface WAPR1IT.

[Question 18] Why do consider your selected interface more beautiful than the other?

[Question 18: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 11/26

[Question 19\*] Which interface is more beautiful?



Interface WOCO2IT



Interface WAPR2IT

[Question 19\*: Possible Answers] Interface WOCO2IT, Interface WAPR2IT.

[Question 20] Why do consider your selected interface more beautiful than the other?

[Question 20: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 12/26

[Question 21\*] Which interface is more beautiful?



Interface WAPR3IT



Interface WOFA3IT

[Question 21\*: Possible Answers] Interface WAPR3IT, Interface WOFA3IT.

[Question 22] Why do consider your selected interface more beautiful than the other?

[Question 22: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 13/26

[Question 23\*] Which interface is more beautiful?



Interface WAPR4IT



Interface WONO4IT

[Question 23\*: Possible Answers] Interface WAPR4IT, Interface WONO4IT.

[Question 24] Why do consider your selected interface more beautiful than the other?

[Question 24: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 14/26

[Question 25\*] Which interface is more beautiful?



Interface WOUN5IT



Interface WAPR5IT

[Question 25\*: Possible Answers] Interface WOUN5IT, Interface WAPR5IT.

[Question 26] Why do consider your selected interface more beautiful than the other?

[Question 26: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 15/26

[Question 27\*] Which interface do think everyone else would consider more beautiful?



Interface WAPR1MP



Interface WOCL1MP

[Question 27\*: Possible Answers] Interface WAPR1MP, Interface WOCL1MP, Don't know / Can't tell.

[Question 28] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 28: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 16/26

[Question 29\*] Which interface do think everyone else would consider more beautiful?



Interface WOCO2MP



Interface WAPR2MP

[Question 29\*: Possible Answers] Interface WOCO2MP, Interface WAPR2MP, Don't know / Can't tell.

[Question 30] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 30: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 17/26

[Question 31\*] Which interface do think everyone else would consider more beautiful?



Interface WOFA3MP



Interface WAPR3MP

[Question 31\*: Possible Answers] Interface WOFA3MP, Interface WAPR3MP, Don't know / Can't tell.

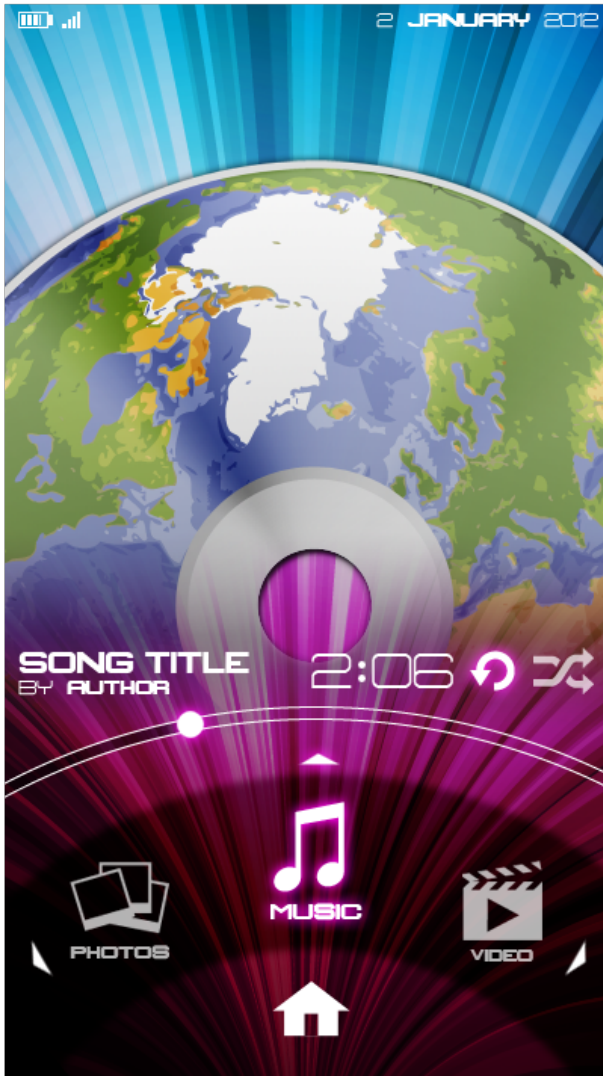
[Question 32] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 32: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

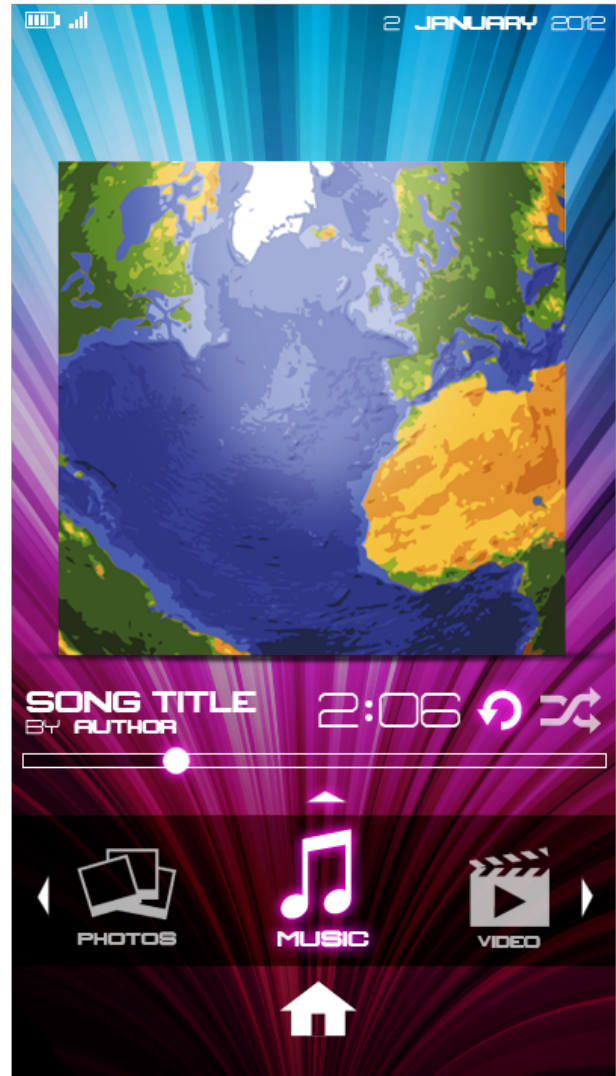
[-----]

Page 18/26

[Question 33\*] Which interface do think everyone else would consider more beautiful?



Interface WAPR4MP



Interface WONO4MP

[Question 33\*: Possible Answers] Interface WAPR4MP, Interface WONO4MP, Don't know / Can't tell.

[Question 34] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 34: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 19/26

[Question 35\*] Which interface do think everyone else would consider more beautiful?





Interface WAPR5MP



Interface WOUN5MP

[Question 35\*: Possible Answers] Interface WAPR5MP, Interface WOUN5MP, Don't know / Can't tell.

[Question 36] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 36: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 20/26

[Question 37\*] Which interface do think everyone else would consider more beautiful?



Interface WOCL1IT



Interface WAPR1IT

[Question 37\*: Possible Answers] Interface WOCL1IT, Interface WAPR1IT, Don't know / Can't tell.

[Question 38] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 38: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 21/26

[Question 39\*] Which interface do think everyone else would consider more beautiful?



Interface WOCO2IT



Interface WAPR2IT

[Question 39\*: Possible Answers] Interface WOCO2IT, Interface WAPR2IT, Don't know / Can't tell.

[Question 40] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 40: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 22/26

[Question 41\*] Which interface do think everyone else consider more beautiful?



Interface WAPR3IT



Interface WOFA3IT

[Question 41\*: Possible Answers] Interface WAPR3IT, Interface WOFA3IT, Don't know / Can't tell.

[Question 42] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 42: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 23/26

[Question 43\*] Which interface do think everyone else would consider more beautiful?



Interface WAPR4IT



Interface WONO4IT

[Question 43\*: Possible Answers] Interface WAPR4IT, Interface WONO4IT, Don't know / Can't tell.

[Question 44] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 44: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 24/26

[Question 45\*] Which interface do think everyone else consider more beautiful?



Interface WOUN5IT



Interface WAPR5IT

[Question 45\*: Possible Answers] Interface WOUN5IT, Interface WAPR5IT, Don't know / Can't tell.

[Question 46] Why do consider that anyone else would find the selected interface more beautiful than the other?

[Question 46: Possible Answers] [This is a text box field so anything that can be written counts as an answer.]

[-----]

Page 25/26

[Question 47\*] Please checkmark the words that in your opinion apply to the current interface.



[Question 47\*: Possible Answers] human, technical, pleasant, unpleasant, simple, complicated, professional, unprofessional, ugly, attractive, practical, impractical, likable, disagreeable, cumbersome, straightforward,

inventive, conventional, isolating, connecting, stylish, tacky, predictable, unpredictable, cheap, premium, alienating, integrating, unpresentable, presentable, rejecting, inviting, unimaginative, creative, good, bad, confusing, clearly structured, repelling, appealing, bold, cautious, innovative, conservative, dull, captivating, undemanding, challenging, motivating, discouraging, novel, ordinary, unruly, manageable

[-----]

Page 26/26

[Question 48\*] Please checkmark the words that in your opinion apply to the current interface.



[Question 48\*: Possible Answers] human, technical, pleasant, unpleasant, simple, complicated, professional, unprofessional, ugly, attractive, practical, impractical, likable, disagreeable, cumbersome, straightforward, inventive, conventional, isolating, connecting, stylish, tacky, predictable, unpredictable, cheap, premium, alienating, integrating, unpresentable, presentable, rejecting, inviting, unimaginative, creative, good, bad, confusing, clearly structured, repelling, appealing, bold, cautious, innovative, conservative, dull, captivating, undemanding, challenging, motivating, discouraging, novel, ordinary, unruly, manageable

[-----]

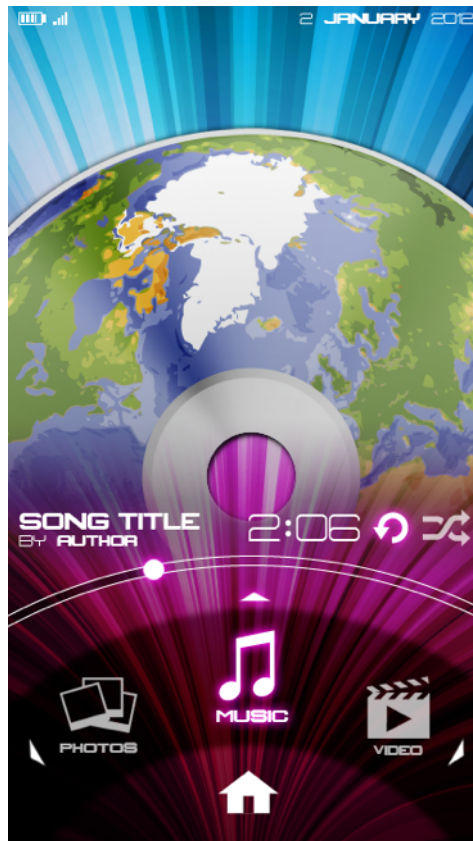
**[Conclusion Page]**

**Almost done! (please don't close this window)**

Under this keyboard there is an envelope containing a couple of documents. A marker has been given to you to perform this last part of the experiment.

In this part of the experiment you will need to highlight the area or areas that you find the most beautiful in the interface.

**Thank you for lending us some of your time by being part of this experiment.**



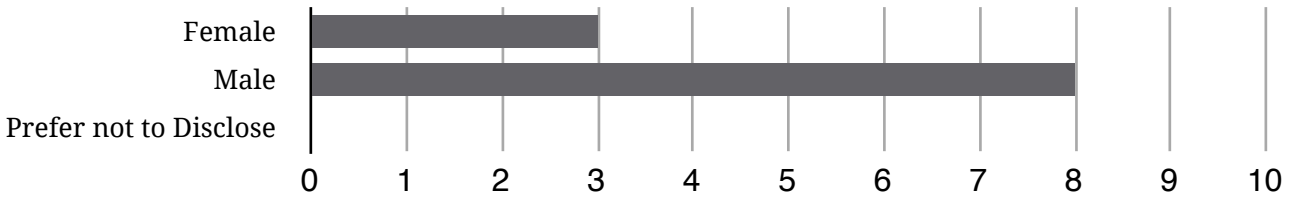
## Results

In this chapter you will be able to find the graphs of the results listed according to each question. The questions were listed in the same way as the questionnaire chapter (see *Questionnaire chapter in the Appendix for more information*).

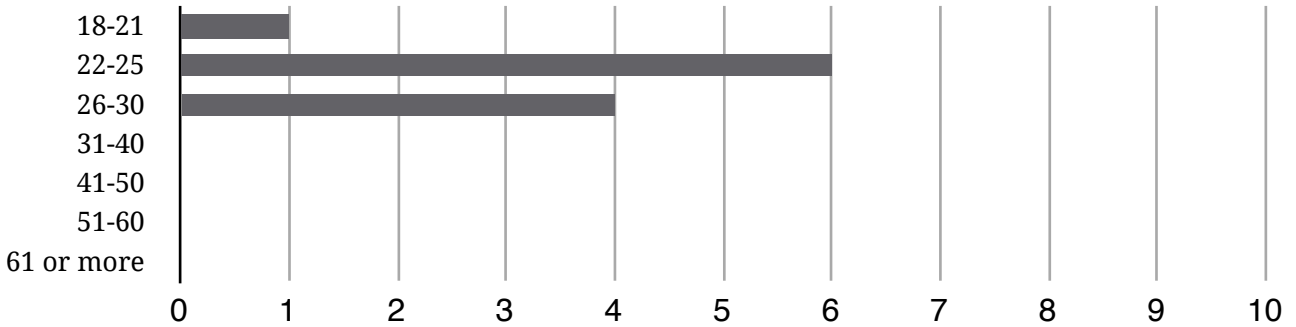
### Demographic-related questions

[Question 1\*] does not appear in the results because it is of procedural nature, and the participant had to agree with it before taking the test. It is safe to assume that a 100% of the participants agreed with the statement.

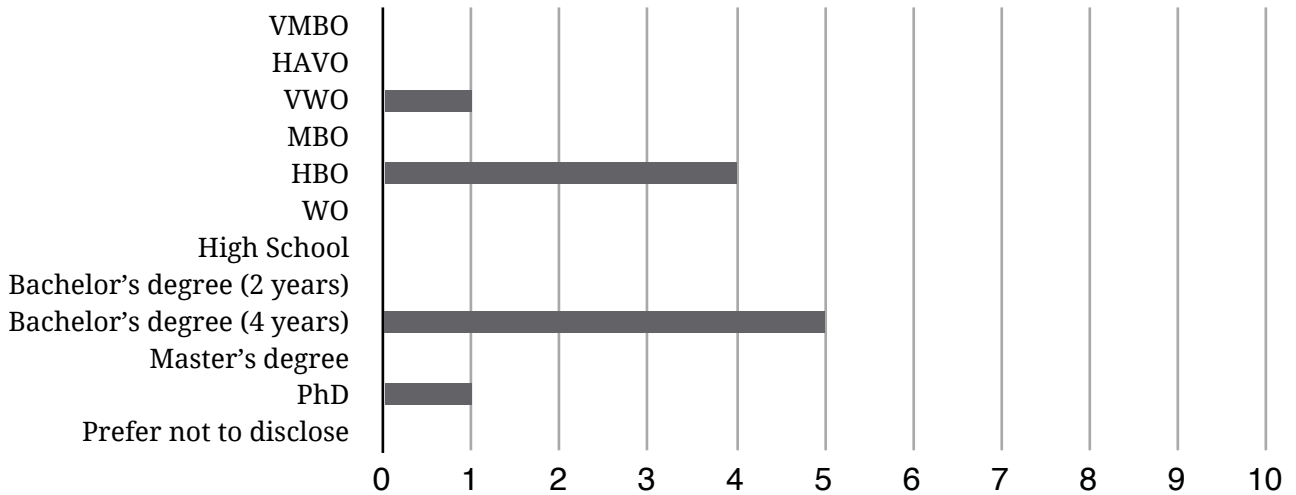
[Question 2\*] What is your gender?



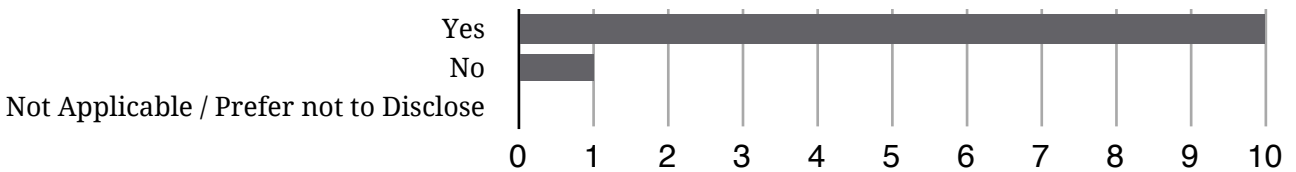
[Question 3\*] What is your current age?



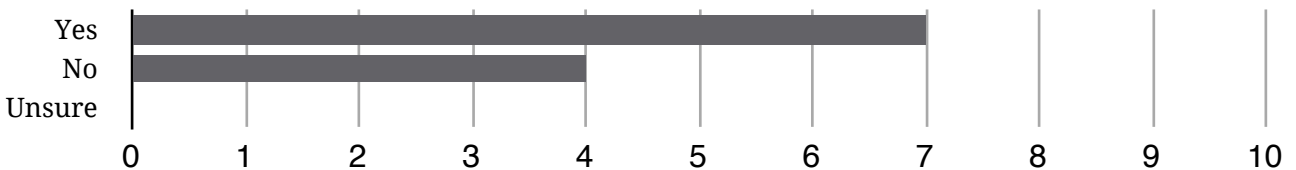
[Question 4\*] What is the highest level of education you have completed?



[Question 5\*] Are you currently studying in a higher level than the one you stated above?



[Question 6\*] Have you ever had any formal Visual Design / Graphic Design related education or experience? (Example: Interface Design, Brand Design, Illustration, etc.)



**Experiment-related questions**

In the following section bar charts were placed. In order to not extend this report more than what it is needed the images were removed. Since many questions were repeated and just the image containing the interfaces

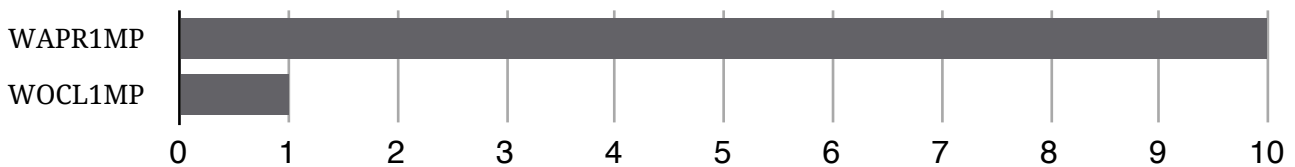
changed, we have decided to add brackets at the end of each question with the names of each interface that is being compared. (e.g. In question 13 the participant compares WAPR4MP with WONO4MP, so the brackets would look [WAPR4MO vs. WONO4MP] right after the question). It is important to remember that all the interfaces of the WAPR family are basically the same according to their design project. However they were divided as if they were different interfaces due to organizational purposes during the experiment. Like in the Questionnaire sub-chapter in the Appendix chapter, every item or text within brackets and in italic ( [example] ) did not appear in the actual Questionnaire. (It is possible to find the images of each interface in the Questionnaire chapter in the Appendix section).

As discussed in the Results sub-chapter of the Experimentation chapter (Principles section); “Global opinion” does not mean the Global opinion of the participants but what the participant thinks is the global opinion regarding the beauty of an interface. (For more information please read the Principles section of the Results sub-chapter in the Experimentation chapter).

The qualitative sections are being cited as they were written, no corrections were applied. A random number was assigned to allow the reader to find the relation of the answer and the author of the comment.

### ***Project 1 (Music Player): Personal Opinion***

[Question 7\*] Which interface is more beautiful? [WAPR1MP vs. WOCL1MP]



[Question 8] Why do consider your selected interface more beautiful than the other? [WAPR1MP vs. WOCL1MP]

**10262393**

I feel like the eath is crowded by having it up as high in interface WOCL1MP. And maybe the text is a bit too long to be beautiful. Again it feels crowded.

**10261909**

Less (distracting) text. Although I think the pink lines could be more subtle (smaller).

**10199416**

because it is simpler than another one

**10197722**

the interface WAPR1MP looks very complete to me. All the information that is on it is clear and good to see. there is no distraction on the screen. I think the long teks on the other interface distracts, i wouldnt read it and it makes the interface look abit chaotic. I cant imagine so much information that needs on the screen of my ipod. My chosen interface looks very dynamic and. The colorwave that comes from the bottom gives it a dynamic feeling. furthermore it looks very colorful. It is not to ful and there is enough room around the earth symbol. the other interface looks to me abit to full. I like the interface mor because i think i could use it easily. I can imagine how to use it to reach my goal. it looks pretty and modern.

**10196810**

it has less text

**10195504**

It is not crowded with text, and the design is simple, and also has bright colours- for me bright colors make it mor appealing.

**10163377**

Brighter image, more color, clear

**10160901**

because its cleaner. There is no text earea overlayed the background image. And since the text earea was filled with lorem ipsum. also the purple ray's that are behind the menu items are in the wapr1mp example beter



worked out. Since they overlay the background image of the earth. in the other example the background image is put in front of the ray's. this does not make any sence since the menu is more important then the background image. but I have some doubt on wheter or not you can compare these, since the right interface clearly has another purpose.

**10160624**

clean; overview; purple reaches funder

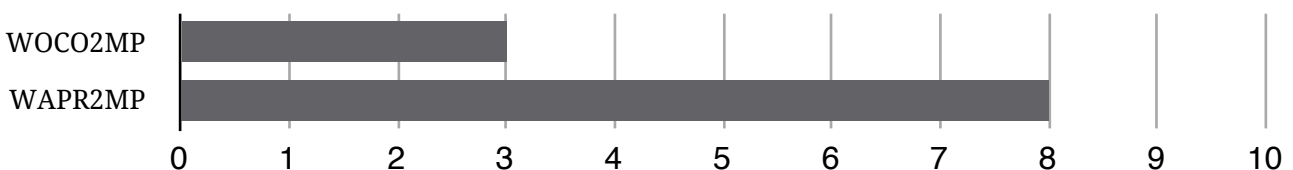
**10160047**

partly because i don't feel that information is being excluded, as in media artwork and lyrics In a media player i want to enjoy the content, not the player

**10149163**

It is simpler and loks, because of the free space, less cluttered than the other interface. The brighter colors make it look more appealing and friendly.

[Question 9\*] Which interface is more beautiful? [WOCO2MP vs. WAPR2MP]



[Question 10] Why do consider your selected interface more beautiful than the other? [WOCO2MP vs. WAPR2MP]

**10262393**

The style of the letters is more in line with the style of the icons. This make the interface feel more like one. The WOCO2MP feels like it has taken parts of other interfaces (mostly style of the letters) and just put them together. If the same was done with the icons, I might have liked it better. But then again it would then feel more like one.

**10261909**

WAPR2MP has a style that is the same for all texts, which unites everything.

**10199416**

because the color of circle arrow is different than its background

**10197722**

I think the second interface is more beautiful caus it is more uniform. the typography is the same everywhere. I like the fond because it fits the topic: music, modern.... for me there is no need in having a second fond on such a small scree. id rather ask myself: why is this in a different font....strange.....

**10196810**

the font is better

**10195504**

The use of a stylish font (Song Title) makes it more beautiful

**10163377**

It has a font that fits better in the rest of the design

**10160901**

the typography is more unified. This unity in typograpy makes the interface more at ease. in this way it does not draw much attention to tself, so the content can shine trough, in the woco2mp interface, the typography distracts from the actual task helping the user to do stuff.

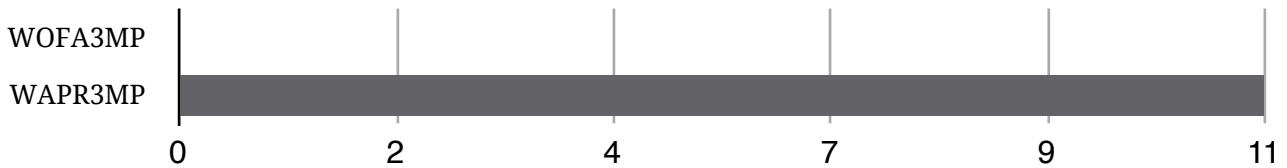
**10160624**

consistent font type; formal fonttype

**10149163**

I prefer this interface because the fonts used for the date and the author of the song are easier to read and clearer. This is not the case for the font of the song title though.

[Question 11\*] Which interface is more beautiful? [WOFA3MP vs. WAPR3MP]



[Question 12] Why do consider your selected interface more beautiful than the other? [WOFA3MP vs. WAPR3MP]

**10262393**

I like the natural lines of the earth better. Also it kin of represents a CD which I think is appropriate. I also think the icons (music, photos, video) are more clear. Music is for more more connected with music notes then with a CD.

**10261909**

WOFA3MP has no unity, the three elements don't mix. In WAPR3MP they do mix, which makes the total better.

**10199416**

the another one doesn't make sense

**10197722I**

would defntly choose the second interface on the right. it looks like a complete picture. the WOFA3MP looks very strange to me. the part of the worldpicture in the middel fo the first interface looks like it shoudl be there. it looks wrong.

**10196810**

the background image is more proper.

**10195504**

The use of the disc shape makes it more logical and realistic- i.e. i can identify the disc shape with music

**10163377**

The other one looks broken and has no description under the icons

**10160901**

in this interface there is no hard edge between background images. The edge in the other example makes for a break in the experience, and some of your attention is directed to the edge, wich again leads to an disruption in the experience while using the ui. Since the background image is used only for astatic purposes.

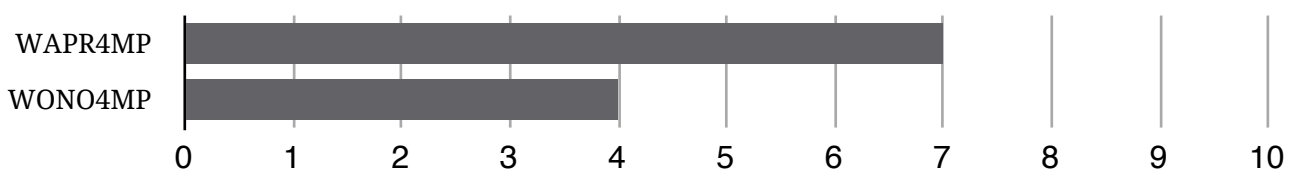
**10160624**

does it need comment? the hard lines in the ugly image are... ugly.

**10149163**

The other interfaces looks inhomogeneous. The picture of the earth just does not integrate with the rest of the interface at all.

[Question 13\*] Which interface is more beautiful? [WAPR4MP vs. WONO4MP]



[Question 14] Why do consider your selected interface more beautiful than the other? [WAPR4MP vs. WONO4MP]

**10262393**

I like the curved lin better, it feels more natural to me :)

**10261909**

In WAPR4MP, the globe is part of the background, and it looks nice. However, in WONO4MP, the picture of earth is in the foreground, and it doesn't fit in the context of a media player, its function is not clear. This makes it strange to look at, making WAPR4MP more beautiful for me.

**10199416**

the another one is not artistic

**10197722**

I like the interface on the left side more than the one on the right side. First of all i like the backround design more. it is one picture and it looks nice. I alos prefere the way the menue is organized. the curve in the menu slider fits in the whole design. Everything is abit round and and therefor the menue slider looks like it shoud be there.

**10196810**

image without border is better

**10195504**

It is more artistic

**10163377**

Hard decision, is the earth cover art? than the other image is a cd? that's old fashioned The curved interface is pretty though

**10160901**

This clearly distinguish between the album art and the background. So in this way, you can see more clearly that the song playing is from that album.

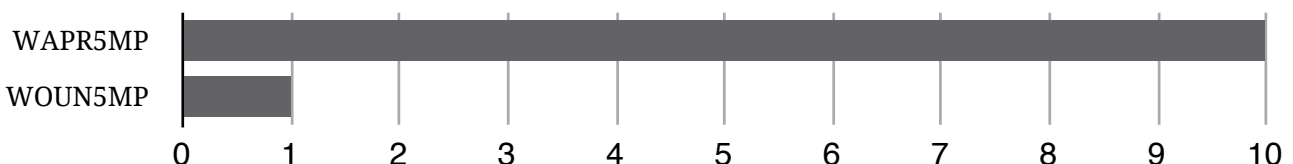
**10160624**

a whole

**10149163**

I consider this image more beautiful since the controls seem easier to read since they are arranged straightly. The rectangle might be a good place to display album artwork. It appears as well more structured and less nervous.

[Question 15\*] Which interface is more beautiful? [WAPR5MP vs. WOUN5MP]



[Question 16] Why do consider your selected interface more beautiful than the other? [WAPR5MP vs. WOUN5MP]

**10262393**

The WOUN5MP feels like I am watching fireworks explode. It feels too busy.

**10261909**

To be honest, I don't know, I just like WAPR5MP better.

**10199416**

the another one is weird

**10197722**

I prefer the interface WAPR5MP. it is dynamic but it isn't chaotic. there is enough room for everything. the menu is clear and the shadow behind the menu highlights it a bit. the interface on the right side is a bit chaotic. the words song title and the author are too far apart and it is not clear anymore that they go together.. i like to have the menu with the name of the song and the author and the time etc in one line. i also think that the design is way nicer of the WAPR5MO design. the pink colorwave is part of the picture and is not too dominant. on the interface on the right side the pink colorwave is a bit too extreme for me. it looks like the earth picture will be kicked out of the display...

**10196810**

the background in the other image is distracting the upper text

**10195504**

It brings out enthusiasm- the pink rays give the impression that the song is something one needs to listen to.

**10163377**

Looks more like a whole, 1 screen. There's a fold in the other screen Title and time is in one line

**10160901**

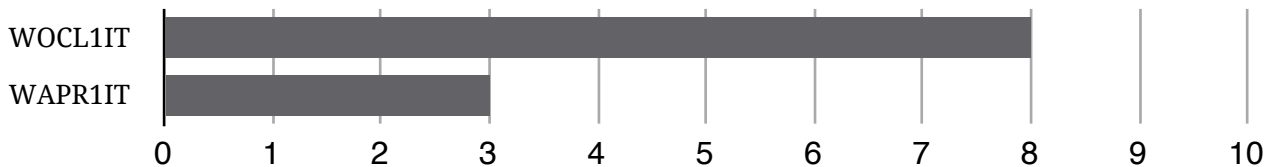
The proportions of the elements on screen are more balanced. The WAPR5MP interface is off balance, and is really odd looking.

**10149163**

The other interface looks unstructured since the graphical elements guide my eyes away from the controls It also looks far more nervous. This dark shading of the controls that gives it at least some structure is also missing.

**Project 2 (Internet TV): Personal Opinion**

[Question 17\*] Which interface is more beautiful? [WOCL1IT vs. WAPR1IT]



[Question 18] Why do you consider your selected interface more beautiful than the other? [WOCL1IT vs. WAPR1IT]

**10262393**

This one is harder to choose. I like the WOCL1IT just a bit better, because it lacks the tv icon on top, which feels like it is too much. On the other hand I do like the placement of the icons of the WAPR1IT better. The icon on the top however does outweigh what I like about it.

**10261909**

Smaller icons look more cleaner.

**10199416**

the icons in WAPR1 | T are too big

**10197722**

I think i like the left interface more than the right. the symbols are easy and clear. i don't think i need the words that explain them to me cause they are easy and everyone knows them anyway. i think the additional words bring unnecessary information into the interface and might cause more confusion than organization.

**10196810**

common symbolic icons are clear enough to describe functions

**10195504**

Everything is balanced, thus giving a clear picture.

**10163377**

bit less messy

**10160901**

in this example there is a clear distinction between navigation and content. in the wapr1it interface the navigation is spread out across the whole screen. which makes for a more confusing experience while navigating since you have to look all over the place. The woco1it is more balanced since it also does not use both icons and text to distinguish the different menu items. also it's a tad smaller, so this leaves more screen estate over to the actual content you want to view.

**10160624**

clear what icons mean.

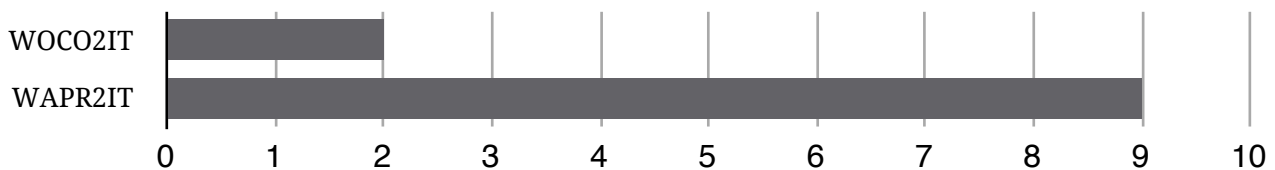
**10160047**

because it makes use of the size of the screen more efficiently than the other, also if you are looking for content, it is nice to have a confirmation of the type of content close to the content itself

**10149163**

There is more space between the elements. The written names of the commands combine nicely with the icons.

[Question 19\*] Which interface is more beautiful? [WOCO2IT vs. WAPR2IT]



[Question 20] Why do you consider your selected interface more beautiful than the other? [WOCO2IT vs. WAPR2IT]

**10262393**

The placement of the icons is more balanced, and the search bar is in the middle. I think the search bar only should be at the left if the space on the right is used.

**10261909**

Having elements aligned left and right looks strange, everything in center looks better.

**10199416**

the color of its highlight is more beautiful

**10197722**

i like this interface more because it looks more compact. the symbols and titles are right in front of me. i don't have to move my eyes to read them. on the left interface i actually have to read from the left to the right to see all the possibilities i have.

**10196810**

the icon grid of the left picture is not equal for each icon, and it is not aligned to center

**10195504**

There is still some balance in the picture and added height

**10163377**

The other seems out of line

**10160901**

it does not use yellow to highlight the active menu item. The yellow is not a good choice to use in this interface since it breaks with the overall style of the navigation. It also catch to much of your attention, attention that should go to the content not to the navigation. The one with the with highlight you could say is more mature, serious and consitent and better polished. It more professional.

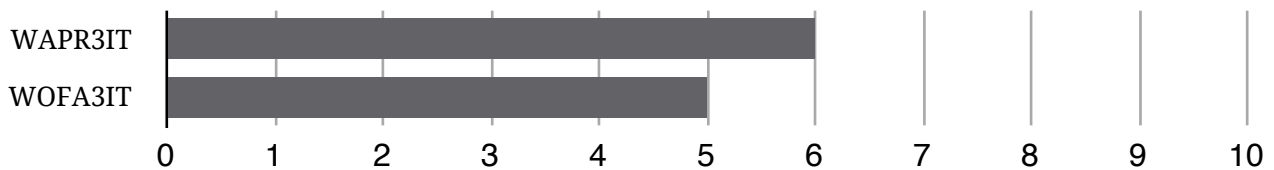
**10160624**

everything centered

**10149163**

The vertical arrangement of the buttons is easier to read and looks more structured and homogeneous. The search that is placed in the middle lets the interface look more balanced.

[Question 21\*] Which interface is more beautiful? [WAPR3IT vs. WOFA3IT]



[Question 22] Why do consider your selected interface more beautiful than the other? [WAPR3IT vs. WOFA3IT]

**10262393**

I prefer the use of icons over text. I also like it that you can see the origin of the selected program. However, I do think that that information is not in the right place now.

**10261909**

Less (redundant) info, looks cleaner.

**10199416**

the menu in WOFA3IT is too simple

**10197722**

when i look at interface WAPR3IT i dont read the words i more look for the symbols. i dont need to read the words to understand the meaning of the button. personally i prefere symbols over words.

**10196810**

either text only or icon only will be enough to describe the functions. simpler is better.

**10195504**

Same reason as before: balance

**10163377**

the icons make the buttons they represent more obvious

**10160901**

This interface makes a choice between either icons or text. Both is unnecessary and might even confuse people, if the icon does not perfectly represent the text. Pictures are here represented by an camera, the icon itself could let people believe that there is an actual camera to make pictures with. also the interface does not brand the search bar with google stuff.

**10160624**

don't like the google search text

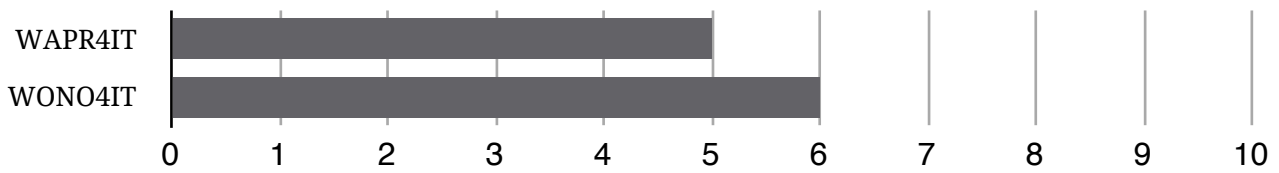
**10160047**

because else, i don't have a clue what the text bar does, or even what it is also i believe the icons make it usable for more people, of different ages and languages

**10149163**

The removed icons create space between the interface elements making it les tiring to look at them.

[Question 23\*] Which interface is more beautiful? [WAPR4IT vs. WONO4IT]



[Question 24] Why do consider your selected interface more beautiful than the other? [WAPR4IT vs. WONO4IT]

**10262393**

I like curved lines as in WAPR4IT, but in this case I think the WONO4IT is more clear. Which in this case I think is more beautiful.

**10261909**

The circular shape adds depth and distance between the elements, which is nice. The other one looks very full.

**10199416**

The picture of the disc on the top of WAPR4IT is bad

**10197722**

Im not very sure here but i would go for interface WONO4IT. i cant really say why i like this one more. to go to the next page i have to use the arrows. i think the motion that i have to make with my finger to go to the next page fits better to the second interface than to the interface to the left.

**10196810**

it has 3D effect which enrich the visual style

**10195504**

The "curve" effect adds flair to it, as opposed to the square in the other one.

**10163377**

the curve is nice, feels more natural

**10160901**

its more focused onto the content itself. The half circle where the videos are presented onto in the other interface is a neat feature to look at, but it does not really add something to the experience. but more importantly the wono4it does not have to top navigation stuff, which is a real deal-breaker for me.

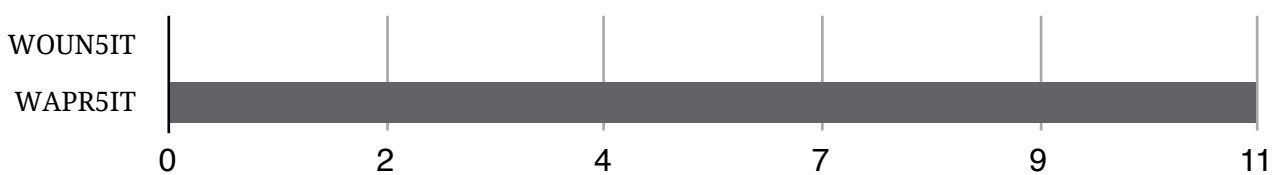
**10160624**

everything is presented flat.

**10149163**

The missing three-dimensional effect makes the interface look less complex and more structured. It is more comfortable for my eye to be scanned.

[Question 25\*] Which interface is more beautiful? [WOUN5IT vs. WAPR5IT]



[Question 26] Why do consider your selected interface more beautiful than the other? [WOUN5IT vs. WAPR5IT]

**10262393**

WAPR5IT is more balanced. It feels ugly and wrong to spread the words and icons, unless you use the space for something.

**10261909**

Similar elements grouped together, which makes more sense and is more beautiful.

**10199416**

in WOUN5IT, the distance between one icon of menu to another one is too far

**10197722**

Interface WAPR5IT looks definitely more beautiful to me than interface WOUN5IT. the menu is clear and well organized. the menu on the other interface looks completely chaotic. I don't know why there needs to be so much room between the button radio and web..... for me it is important that I see everything at once, that I don't have to search for a button...

**10196810**

all icons are aligned in the center

**10195504**

Balanced interface-it simply appears more clearer .

**10163377**

the other one looks like the info is scattered over the screen

**10160901**

the interface on this one is not scattered around the whole screen.

**10160624**

more space for menu-items

**10160047**

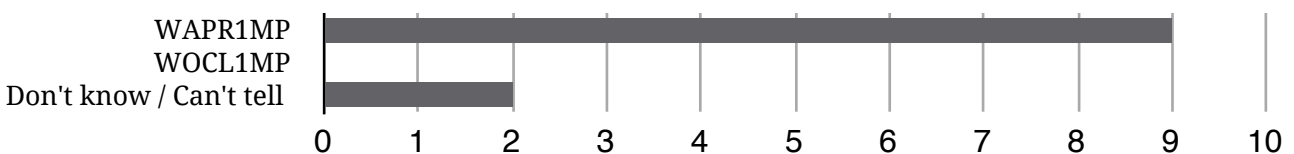
because that way it is more clear that they are similar criteria, that you may choose only ONE of the possibilities

**10149163**

Obvious :) The elements are not spread randomly across the screen.

### ***Project 1 (Music Player): Global Opinion***

[Question 27\*] Which interface do think everyone else would consider more beautiful? [WAPR1MP vs. WOCL1MP]



[Question 28] Why do consider that anyone else would find the selected interface more beautiful than the other? [WAPR1MP vs. WOCL1MP]

**10262393**

I don't know for sure because they still are close together for me. Just a bit too much text.

**10261909**

I think because people don't like walls of text in general.

**10199416**

the paragraph on WOCL1MP is disturbing

**10197722**



I think anyone else would like the WAPR1MP better than the other one. noone likes to read so long texts and noone does it, especially not on the screen of a ipod.

**10196810**

i don't know. the choice depends on everyone's preference.

**10195504**

It is simple, clear and not congested

**10163377**

clear

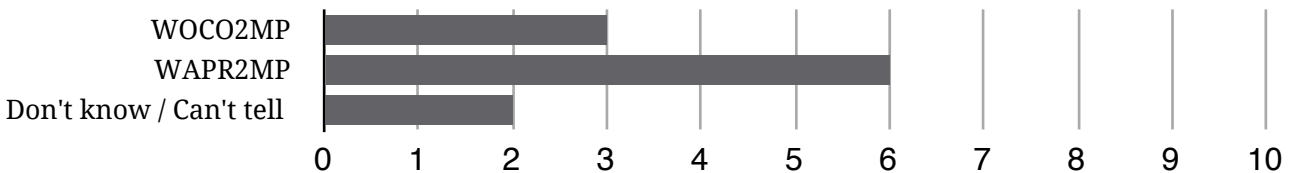
**10160901**

it does not have the text overlay. and images are more powerful than words, so the bigger image wins for the general opinion.

**10149163**

There are more graphical effects and it uses brighter and friendlier colors.

[Question 29\*] Which interface do think everyone else would consider more beautiful? [WOCO2MP vs. WAPR2MP]



[Question 30] Why do consider that anyone else would find the selected interface more beautiful than the other? [WOCO2MP vs. WAPR2MP]

**10262393**

One style.

**10261909**

Don't know, perhaps people some people like the different fonts.

**10199416**

the color of its highlight is better

**10197722**

i dont really know. i think this is a matter of taste.... some people might like ti to have different fonts on the displays, i find it chaotic but others might find it pretty.

**10196810**

the selected font is more futuristic and applicable for current use

**10195504**

Simplicity with a touch of style due to the use of a stylish font

**10163377**

font is more in line with the other fonts

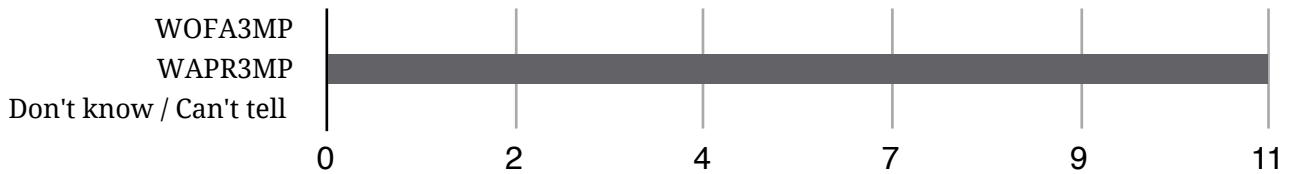
**10160901**

the unified typography makes it look more professional so that is why i thing people choose this one.

**10149163**

The fonts are easier to read since they are lighter.

[Question 31\*] Which interface do think everyone else would consider more beautiful? [WOFA3MP vs. WAPR3MP]



[Question 32] Why do consider that anyone else would find the selected interface more beautiful than the other? [WOFA3MP vs. WAPR3MP]

**10262393**

More natural.

**10261909**

I think people like interfaces in which the elements are a unity.

**10199416**

because the rectangle map of WOFA3MP is bad

**10197722**

im pretty sure that most people will find the WAPR3MP more beautiful than the one on the left side. everyone will ask themselves why is there a pie of atlantic on my screen.

**10196810**

i think that the left image is not quite profesional design

**10195504**

The use of the CD Disc makes it more relevant- i.e. songs are stored on CD

**10163377**

There are 2 distinct lines in the other image

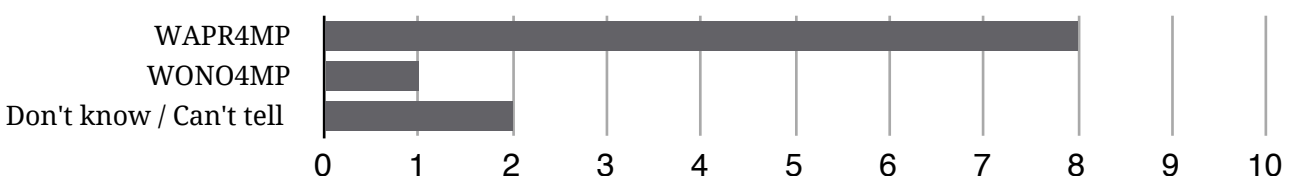
**10160901**

this one does not have the weird looking edge in the middel of the image. That could be seen as a bug/ fault in the system. the wapr3mp is more polished so that is the one people choose.

**10149163**

Obvious. The rectangle on the other interface does not fit at all with the rest.

[Question 33\*] Which interface do think everyone else would consider more beautiful? [WAPR4MP vs. WONO4MP]



[Question 34] Why do consider that anyone else would find the selected interface more beautiful than the other? [WAPR4MP vs. WONO4MP]

**10262393**

More natural. WONO4MP feels like it does not belong together.

**10199416**

because the rectangle map in WONO4MP is bad

**10197722**

i also sure that most people will find the interface on the left nicer than the one on the right. the menu looks prettier, more organized, modern. the background design is complete.

**10196810**

in my opinion, all designs are acceptable by everyone

**10195504**

It is artistic

**10163377**

curvy lines

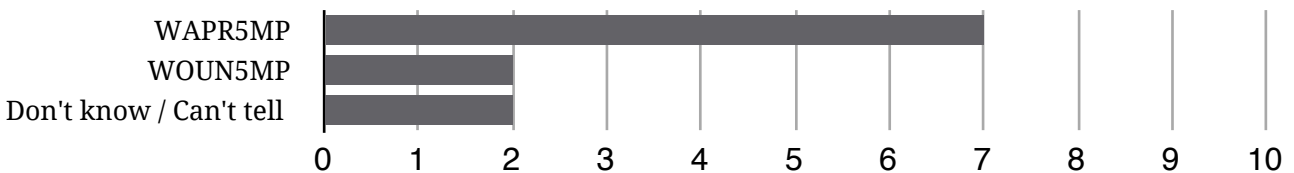
**10160901**

It depends on the functionality. If i look at the wono4mp interface I expect i can swipe over the cover album to go to the next song/album, because it's now an element in the UI. In the wapr4mp interface the album art is merged with the background so no expectations of functionality arise with me. but if it would have the swipe functionality wono4mp would win. if it does not have the functionality wapr4mp wins.

**10149163**

Easier structure. Confirms to what we are used to from such devices.

[Question 35\*] Which interface do think everyone else would consider more beautiful? [WAPR5MP vs. WOUN5MP]



[Question 36] Why do consider that anyone else would find the selected interface more beautiful than the other? [WAPR5MP vs. WOUN5MP]

**10262393**

WOUN5MP is too much for me, but I can imagin that other would like it better.

**10261909**

Really depends on the person.

**10199416**

because WAPR5MP is more artistic than WOUN5MP

**10196810**

the gradient color in the right image is annoying

**10195504**

It is more enthusiastic

**10163377**

the other one looks a bit more messy

**10160901**

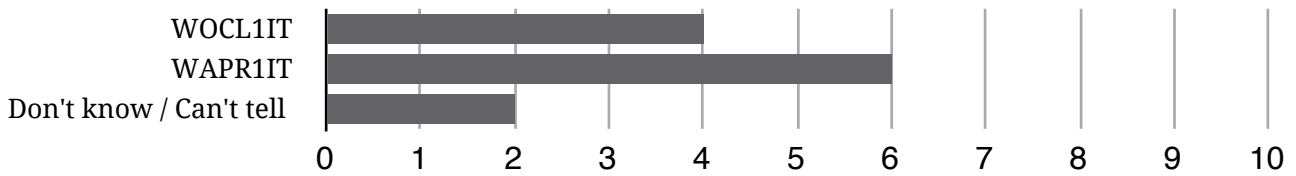
this interface is better in balance and i thing most people notice this,

**10149163**

See my previous explanation.

### **Project 2 (Internet TV): Global Opinion**

[Question 37\*] Which interface do think everyone else would consider more beautiful? [WOCL1IT vs. WAPR1IT]



[Question 38] Why do consider that anyone else would find the selected interface more beautiful than the other?  
[WACL1IT vs. WAPR1IT]

**10262393**

more clear.

**10261909**

Some people like text with their icons, some don't.

**10199416**

because the disc (half circle) on the top of WAPR1IT is bad

**10197722**

i think that is kinda dependent on the person. i personally like visualizations. i dont like many words. if you can use a symbol for something that i think its better to use the symbol and not the world. but there will probabaly also be people that dont like symbols so much. other people maybe dont know the symbols or cant see them good enough to understand them.

**10196810**

most people have already been familiar with the symbols / icons

**10195504**

clarity and balance

**10163377**

more subtle

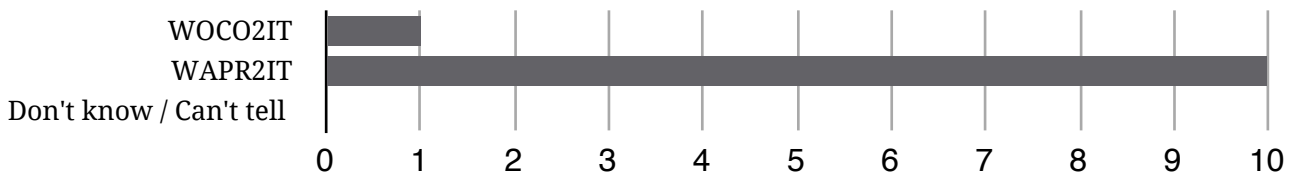
**10160901**

the focus in this interface is more on the content, people want the content so I think thats why they would choose the woel1it interface

**10149163**

See my previous explanation.

[Question 39\*] Which interface do think everyone else would consider more beautiful? [WOCO2IT vs. WAPR2IT]



[Question 40] Why do consider that anyone else would find the selected interface more beautiful than the other?  
[WOCO2IT vs. WAPR2IT]

**10262393**

More balanced.

**10261909**

Most people like things that are symmetric.

**10199416**

because the the color of its highlight (WOCO2IT) is more beautiful

10197722

i guess that most people will prefer the one on the right. the menu is visible to everyone without a lot of effort.

10196810

it is more neat and well-aligned

10195504

balance

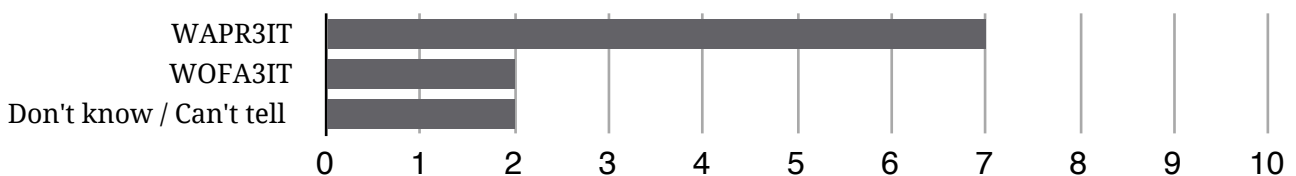
10160901

the searchbar in woco2it is just fucked up, and the yellow is ugly. but the fucked up searchbar will certainly make people choose the other one.

10149163

See my previous explanation.

[Question 41\*] Which interface do you think everyone else would consider more beautiful? [WAPR3IT vs. WOFA3IT]



[Question 42] Why do you consider that anyone else would find the selected interface more beautiful than the other? [WAPR3IT vs. WOFA3IT]

10262393

I like icons, and the world around us is full of them. I think everyone is used to them, and values them.

10261909

Some people like icons, some people like cleaner interfaces.

10199416

there is no icon of the menu in WOFA3IT

10196810

I am not sure. both interfaces can be accepted by most people.

10195504

use of icons for radio, web, etc

10163377

clear icons

10160901

it's a cleaner interface (no icons or branding the search bar) so more attention is given to the content.

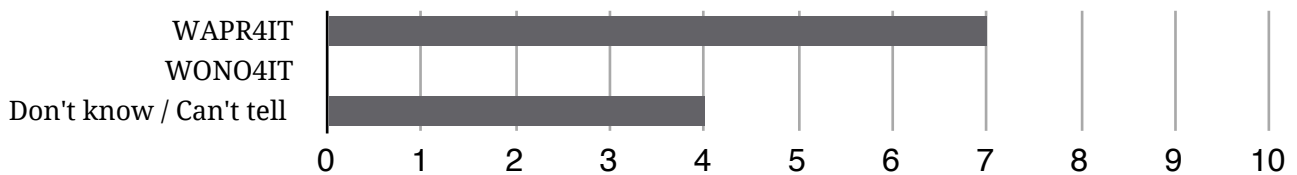
10160624

the google search text represents familiarity

10149163

The icons might make this interface look more appealing. The other interface without the icons might seem too cold.

[Question 43\*] Which interface do you think everyone else would consider more beautiful? [WAPR4IT vs. WONO4IT]



[Question 44] Why do consider that anyone else would find the selected interface more beautiful than the other?  
[WAPR4IT vs. WONO4IT]

**10262393**

? don't know

**10261909**

I really don't know.

**10199416**

because there is curve on the screen of WAPR4IT

**10197722**

i could imagine that most people might prefer the interface WAPR4IT. it looks very dynamic. if you compare the two interfaces the one on the right might look abit "normal" or "boring" to many people. i like to have structure in my interface, but i guess that many people want to have it look fancy....

**10196810**

it depends on preference.

**10195504**

has a bit of flair- the curve as opposed to the square

**10163377**

nice curves

**10160901**

thy cylindrical way of presenting movies is more esthetically pleasing, so that is what people pic as there favourite.

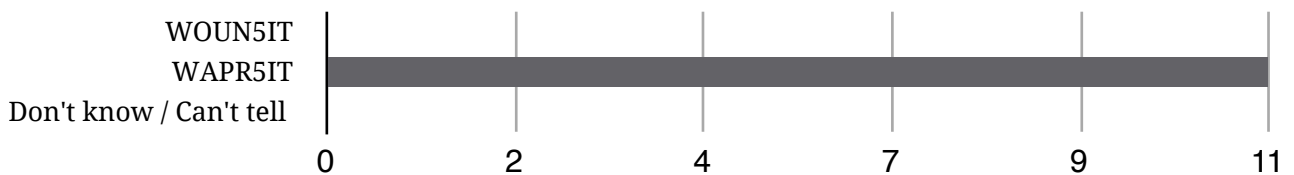
**10160624**

I hope the second, but some would like the first because it is smooth

**10149163**

I think the three-dimensional effect makes it look more appealing to others.

[Question 45\*] Which interface do think everyone else would consider more beautiful? [WOUN5IT vs. WAPR5IT]



[Question 46] Why do consider that anyone else would find the selected interface more beautiful than the other?  
[WOUN5IT vs. WAPR5IT]

**10262393**

More balanced.

**10261909**

I think that most people like elements grouped.

**10199416**

the distance of the menu in WOUN5IT is too far

**10197722**

there is no doubt that people will choose interface WAPR5IT over the other one. it is way easier to use. People dont like to search for buttons. and people also want to be face when they use such a thing. when using interface WOUN5IT the user has to take long distances to reach the bottoms.

**10196810**

it is well-aligned

**10195504**

has balance

**10163377**

ordered

**10160901**

the woun5it is just serriously fucked up, i cannot give one reason why people could like it.

**10149163**

See my previous explanation.

