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V A R A Ž D I N

Dora Ćurković

VISUAL INTERFACE DESIGN OF INTERACTIVE PRODUCTS

BACHELOR'S THESIS

Varaždin, 2018.

UNIVERSITY OF ZAGREB

FACULTY OF ORGANIZATION AND INFORMATICS

V A R A Ž D I N

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Summary

This thesis talks about visual interface design and its elements and principles. The goal of this thesis is to give an overview of most of the topics regarding visual interface design and to propose guidelines that designers should follow to make a successful one. It covers visual aspects of visual interface design and how it relates to branding and psychology; it talks about design principles that have been derived over decades of experience, studies and feedback and that help create good interfaces; the importance of making interfaces accessible to a wide range of users and how to do so. The focus of this theme is on web interfaces and how they relate to interface design in general. The practical part of this thesis is a design of a web interface with the implementation of concepts described in theoretical part.

Key words: visual interface design, interface, web design, accessibility, information design, interaction design, visual design

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1. Introduction

Visual part of an interface is arguably one of its most important parts. Users communicate with an interface through it and often base their first impression on it.

This topic is important and often underrated. Emphasis is often put just on content of an interface. Design is often hurried and not thought through. A huge misconception is that design is only supposed to make things pretty. Visual interface design is not just a pretty disguise – it covers a lot more than just the aesthetics, although it is still extremely important. Visual interface design involves presenting information in a right way, making workflow easy to follow and understandable, representing a brand and creating an image, thinking about how color effects user's emotions and reactions, making interfaces accessible to a variety of users and many other things.

This thesis covers most of these things to a certain extent. To start off, an introduction to visual interface design is given, how it relates to other design fields and what role does aesthetic have in it. Next, the most important elements of visual interface design are covered, and some examples of their good use are shown. Guidelines for making interfaces accessible to users with disabilities and difficulties are shown in the next chapter, and the last theoretical part consists of design principles that designers should strive for in visual design and information design. A practical part consists of a redesign of a website for LED lighting company, from defining the goal, structuring the website and sketching, to picking out the colors, typography and more.

I've chosen this topic because of my passion for design and for expressing personality through art. I think visual design is an extremely important aspect that is often neglected. Web design is something I've always been curious about and something I hope to pursue in the future. I wish more emphasis was put into it during my bachelor studies, so in this way I'm hoping to learn more about the topic that I haven't had a chance to really get into that much.

2. Visual Interface Design

2.1. What is visual interface design?

Visual interface design is a design discipline vital to the development process of interfaces. It is best described as a combination of user experience (UX) and graphic design. Along with aesthetic aspects of a design – images, colors, fonts and others, visual interface design also has to ensure interface's functionality and usability, brand building and most importantly – how all of that communicates to users. Because of that, visual interface design not only concerns colors, fonts and images, but also hierarchy, balance, consistency, information structure and organization, accessibility, and more. (Cooper, Reimann, Cronin, & Noessel, 2014) (Interaction Design Foundation, 2018)

Visual interface design is a discipline that requires a lot of collaboration. Visual interface designers work exclusively on a design direction of an app, website, product or software. They focus on designing color pallets, typography, icons, the design of other repeatable components, imagery, information structure, layouts and hierarchy etc. Their work is creating solutions, for all of these things, that will visually pleasing, structurally good and convey the right message. It's not just designing it to be pretty, but also in knowing design concepts and understanding the decisions behind them. Psychology, knowledge of user's behavior and accessibility is also very important to them.

Visual design is one of the most crucial components to the success of interactive product. Every element on an interface is a mean of communication. Everything from photography and illustrations to colors and typography and layout, reflects the personality of a brand. It's what users base their first impressions on. When users enter an interface the first thing they notice is design. Many users judge the credibility of an interface based on its design.

However, it seems like, despite a clear need for the emphasis on visual design, many interactive products still fail to come off as approachable, easy to use and pleasant. (Cooper, Reimann, Cronin, & Noessel, 2014)

2.2. Why interactive products fail

Interactive products have greatly improved in the last decade or two. A big part of it is because of how far the technology has progressed. Another point is that designers have begun to realize the importance of studying people's needs and applying their findings in the process of design.

However, as mentioned above, many interactive products still don't have good visual interface design. A reason for this lies in the absence of design planning. Businesses continue to focus more on technology and marketing while disregarding the importance of visual design. They tend to put less emphasis on design in product planning and development process. There isn't enough time and money put into the design process. Those kinds of approaches create products that people do not enjoy using. (Cooper, Reimann, Cronin, & Noessel, 2014)

2.3. Visual interface design in relation to other design disciplines

Creating the entire interface demands cooperation from multiple designers and developers from different fields. Visual interface designers are not experts on everything. Generally speaking, to create a good interface with good user experience, you need to have great interaction design, visual design and content. Those three elements are also result of multiple fields cooperating.

Graphic designers design illustrations used on interfaces, interaction designers design interactions happening on interfaces and so on. Visual interface designers should interact with graphic designers, interaction designers, visual information designers. In some cases, they interact with industrial designers. They also have to collaborate with developers, database designers, motion designers, network specialists and know how their work affects them. Sometimes one person can be multiple things, for example both interaction designer and UX designer, but that happens in small companies and/or small projects. (Cooper, Reimann, Cronin, & Noessel, 2014)

2.3.1. Interaction design

Interaction design is the design of the interactions between users and interfaces. Interaction designers design or help with designing everything that is going to be interacted with. When designing interactive products, they are in constant contact with visual interface

designers and their collaboration starts early on. Interaction designers think about prioritizing actions, workflow and functionalities. (Cooper, Reimann, Cronin, & Noessel, 2014) (Interaction Design Foundation, 2018)

2.3.2. Graphic design

Graphic design is a big part of visual interface design. Graphic designers are here to make aesthetically pleasing interfaces. They design illustrations, icons and more. Graphic designers are experts in giving brands personality through color, illustrations and typography. For them, setting the tone and branding is very important, followed by concern for readability and usability. They create aesthetically pleasing interfaces. (Cooper, Reimann, Cronin, & Noessel, 2014) (Mockplus, 2017)

2.3.3. Visual information design

Visual information designers think about the visualization of content. Things get complicated when working with large amounts of data and complex data sets. Visual information designers should be able to take large amounts of information and represent them in an articulate and compact way that user's will be able to understand, and visual interface designer will be able to design for. This primarily involves information hierarchy, choosing what data is important enough to include and how to include it. They also design visual aids such as graphs, charts and other elements that help with displaying quantitative information. (Cooper, Reimann, Cronin, & Noessel, 2014) (Interaction Design Foundation, 2018)

2.3.4. Industrial design

Industrial design is an applied art and industrial designers are people who are responsible for designing a functional and quality of manufactures products. As the name suggest, they work in industries and usually specialize in one field, whether it's in automobiles, medical equipment, toys or something else.

Industrial designers either use interfaces to do their job or outsource a development of an interface that goes into their product. Without expert's help, many interfaces would be too complex and with low usability, so industrial designers often work together with designers that work on interfaces to make an interface that is functional in industry. (Cooper, Reimann, Cronin, & Noessel, 2014) (Tannen & Turpault, 2010)

2.4. Aesthetic in Visual Interface Design

Aesthetic studies beauty and taste. It's mainly associated with literature, painting, photography, architecture and other forms of "traditional" art. During recent decades, it has found its place in human-computer interaction. Aesthetic refers to the visual appeal of a product. (Pajusalu, 2012)

When having aesthetic in mind, designers should be aware that it's not universal. Aesthetic value is subjective, and changes based on user's culture, education, gender, class, age or something else. Because of that, designers need to create a design that is appealing to a specific targeted audience. (Interaction Design Foundation, 2018)

2.4.1. Purpose

Aesthetic is obviously a big part of visual interface design. Many people believe that aesthetic and usability cannot be fulfilled simultaneously, when in fact, if used correctly, aesthetic can improve usability and acceptability. Good aesthetics gives interfaces personality while following function of it. It does not have to be sacrificed or suffer for usability. That is why there are many steps to designing an interface. Aesthetic ideas and functionalities are shaped around one another. (Byrne, Ling Ngo, & Seng Teo, 2002)

Aesthetically pleasing products evoke emotions and senses, have a meaning and associations. Through the years of research and testing, many design principles and rules for aesthetics in visual interface design were proposed. Although aesthetic is largely subjective, lot of "beauty standards" still apply. When incorporated, those design principles immensely improve usability and user experience of a product.

Users are strongly influenced by the aesthetic of an interface. Some of them even prefer esthetics over functionality. Often that is because of how strongly first impressions influence user's long-term attitudes. That is why aesthetic is important – first impressions.

Esthetics give a platform for content to build on. People base their first impressions on how good something looks. They notice aesthetic first. Some studies found that up to 94% of first impressions are design based. (Byrne, Ling Ngo, & Seng Teo, 2002) And many people leave if they're not impressed by it, without even spending much time on the content of an interface. Studies show that users tend to stay longer on interfaces that made good impressions on them. (Abhishek, 2017)

Many people also stay because of aesthetic. Take Apple for example. Apple has a huge fanbase build early on, mainly because of innovation. Their users remain loyal to them largely

because of their recognizable style that they got used to. People will ignore minor usability problems or lack of innovation because of the design and their relationship with it. Bad design can also have a negative influence on a relationship between a brand and it's users. Snapchat lost a lot of its users because of their redesign conducted in the first half of 2018. People tend to associate bad visual design with unprofessionalism and don't trust brands with poor interface design. On the other hand, we've also seen functional websites with simple, little to no design, such as Reddit, remain hugely popular.

However, aesthetics is best used as a support for content and functionality of an interface. There must be a balance. Spending time and money to plan a good visual design will pay off in the future. (Byrne, Ling Ngo, & Seng Teo, 2002) (Abhishek, 2017)

2.4.2. Components

Architecture might be the most similar to the interface design when it comes to aesthetic. In architecture, aesthetic components are symmetry, proportions, lines, textures, balance, flow and others. In visual interface design there are also plenty of components. Some of them stronger influence on users than others. (Interaction Design Foundation, 2018)

Designers and researchers still haven't found a unison of components for aesthetic in interface design. There any many models published.

Obviously, the layout of an interface is important. Descriptives used for layout are usually symmetry, balance, order, cohesion, proportion, rhythm and some others. Both sizes and placements in the layout can be calculated and those can be compared to some basic guidelines that exist. Color is something that cannot be measured so easily. With millions and millions of hues at disposal, there isn't really a way to objectively evaluate how different hues suit each other, but complexity of colors can be measured, and so can contrast. (Pajusalu, 2012)

Some components that are more relevant when working with interactive interfaces are perceived usability, trustworthiness and visual appeal. As said, those are perceived components and cannot be measured, so they require deeper evaluation with research, questionnaires, interviews, tracking and more. (Papachristos & Avouris, 2011)

One paper from 2003 suggests two aesthetic dimensions mentioned – classical and expressive. Visual clarity and simplicity stands for classical aesthetics, where clear, orderly and professional design is dominant. Expressive aesthetics is represented by visual richness and diversity, where designers break design conventions, are more creative and original, fascinating but also sophisticated. (Lavie & Tractinsky, 2003)

Another model from 2010 is a much needed extension to the previous one. There are four facets mentioned – simplicity and diversity, which have been mentioned through the whole history of aesthetics, and colorfulness and craftsmanship. Because of difficulty to measure color suitability, a method was suggested in regard to colorfulness. This paper emphasizes the importance of color in aesthetic objects. Craftsmanship addresses the ability to integrate relevant design components and dimensions. (Moshagen & Thielsch, 2010)

The fact that most of these modern categorizations, models and principles of aesthetics use in interface design is from this century, shows how aesthetics has played a negligible role in human-computer interaction. There is a need for further research, but first and foremost for right measurement methods, especially in perceived aesthetic components. (Lavie & Tractinsky, 2003)

3. Visual Design Elements

3.1. Context

Context of use dictates many visual aspects of design, from screen size to color and use of text or imagery, and it should be one of the starting points for designers. In what situations and surroundings would users use your interface? Interfaces are found everywhere, from laptops and mobile phones to cars and fridges. They could be intended for use on the streets, in a car or at home.

When developing an interface for touchscreen screen consoles in cars, designers should be aware that their interface will be most probably be used while driving and with a finger. Having that in mind, those interfaces should be simple, useful and its elements should be quite big. A touch keyboard might not be convenient for it, so designers and engineers should look for another solution, perhaps Speech-to-Text or something else. Interfaces for restaurants and fast food chains should rely on visual elements, like photos. People will be more likely to remember and buy something to eat if they see it on screen when ordering.

Other attributes, like user's age, are also extremely important. If an interface is intended for older generations, text should be appropriately sized. Later on, every aspect of design is based on those initial guidelines that designers set, so it's extremely important to think about it.

There are also content-sensitive and adaptive interfaces whose features change according to the context of use and thus enhance usability. Those kinds of interfaces are present in both web and mobile/tablet, but as they are more represented and important in mobile and tablet context and don't affect visual design too much, they will not be discussed here. (Krishna, 2015) (Lohmann, Kaltz, & Ziegler, 2006)

3.2. Shape

Every element has its shape, and it is one of its most recognizable attributes. Even without color, people understand what shapes represent. In interfaces, shapes are a basic element. (Cooper, Reimann, Cronin, & Noessel, 2014)

3.2.1. Types

They are usually split into two categories – geometric and organic. Geometric ones are “perfect”, consisting of straight lines and curves, and usually don’t occur naturally. Organic shapes however, are irregular and “imperfect”. Geometric shapes include circles, squares, rectangles, triangles, hexagons and so on, as seen in the Figure 1.



Figure 1: Geometric (blue) and organic shapes (orange)

In recent years, interfaces have become cleaner, more modern, simplistic and less tacky, so geometric shape trend is on the rise too. (Schwarz, 2016) (Novoseltseva, 2016) (Scacca, 2017)

3.2.2. Usage

When used affectively, shapes help communicate with a user, drawing their attentions where it’s needed, and make the design beautiful, creative and organized.

In most interfaces, they are used as a framing technique, framing a body of text or a graphic element, and as elements for navigation and highlighting. Many designers also use them for purely aesthetic usage, as a decoration.

Squares and rectangles are the most traditional and most common ones. They represent stability and formality. Typically, they are used to set the layout, frame text, for buttons and navigation. Circles are softer but still bold. They are used for icons, framing pictures – especially profile pictures, and emphasizing smaller elements such as smaller text. Hexagons are similar to squares but more professional looking, often associated with unity. Triangles indicate direction or motion and are as such used for directional elements like drop navigations, buttons for getting back to the top of the page and so on. (Novoseltseva, 2016) (Scacca, 2017)

3.2.3.Guidelines

Along with previously mentioned uses of different geometric shapes, there are some guidelines for their use.

Balance is the key. If used excessively, shapes are best combined with a few colors or shades to make them stand out more from the bunch or with more ordinary, geometric shapes, like squares and rectangles. Same goes the other way, if there's one predominant shape throughout the whole interface, try putting other shapes in between, using different color and size. But try not to use a whole bunch of different shapes. White space is also pretty important, as it separates shapes and allows them to be in the spotlight. (Cooper, Reimann, Cronin, & Noessel, 2014) (Novoseltseva, 2016)

3.2.4.Examples

In the example shown in the Figure 2, text boxes are framed inside pentagons, some of which look a bit uneven. They are, nonetheless, geometric shapes. Since only one shape is used, hierarchy and diversity are created using different styles of the same shape. Some pentagons are full and color turquoise, some only have grey outline, and one is full and colored dark greyish green which appears almost black. They are all centered in the middle of the page, leaving left and right side almost completely empty. There's also enough white space between them, only occupied by small bolded arrow-like doodles that don't serve and purpose other than to give more dimension to the page. Arrow found in some indicate that clicking on them will result in an action.

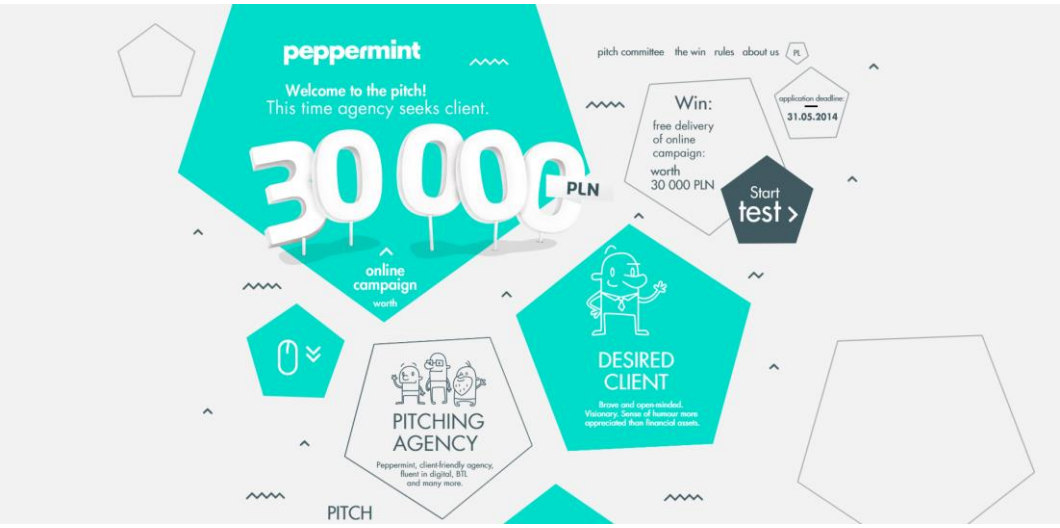


Figure 2: Peppermint (Source: wybieramyklienta.pl)

Some brands are even associated with certain geometric shapes. Instagram, for example, is associated with square pictures, as it was originally the only shape of images you could post on it. Profile images are exclusively round. This, along with the evident difference in position and size, differentiates profile images from images that are published on the site, and creates a better, more scannable and less clustered interface, as shown in the Figure 3.

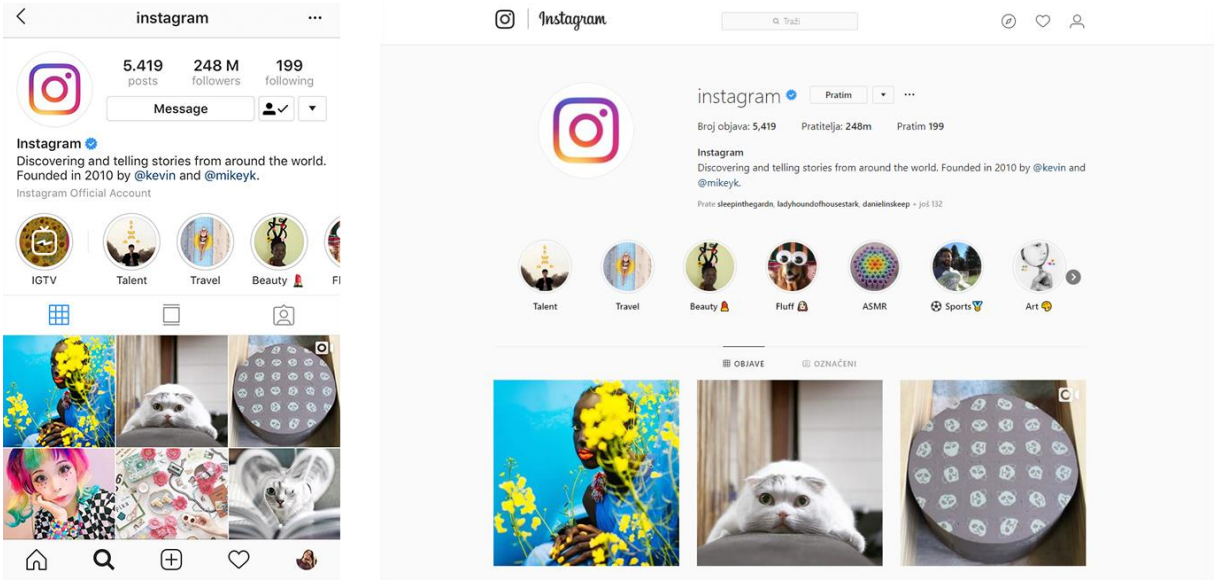


Figure 3: Instagram (www.instagram.com)

3.3. Size

Size of different elements is extremely important in design, especially because it's the main attribute that indicates level of hierarchy. This is especially seen in text, where bigger text is viewed as more important than a regular sized text. Following hierarchy guidelines and proportions helps users understand your interface and find what they are looking for quickly. Other than that, each size should be tested, to see how users feel about it and does it suite the rest of the interface. (Cooper, Reimann, Cronin, & Noessel, 2014) (Coleman, 2018)

3.4. Color

Color is perhaps the most powerful tool designers can use. It plays a vital role in everyday life and design. It's a purely visual means of communication. Designers carefully look at many things when deciding on a color scheme of an interface. There are many points of view to consider, not just from a design standpoint but also from a psychological and technical. When designing an interface, one should ask himself what colors would best represent the brand, while also having context and goals of their users in mind. In addition, designers must be well acquainted with color theory in order to pick out visually pleasing color palette. Will the color compliment the content of an interface? How will it fit into other colors that have been picked out? How many colors should they use? Color decisions should be deliberate and well thought out. (Coleman, 2018) (Krause, 2010) (Cooper, Reimann, Cronin, & Noessel, 2014)

3.4.1. Color theory

Most important terms for basics of color theory are color models and primaries. Color model is a model used to create numerous colors out of set of primaries. There are two types – additive and subtractive, which will be explained further down. Primaries, or primary colors, are named so because they cannot be broken down further, meaning that they are pure and cannot be created using other colors. Equal parts of two primaries create secondary colors, which are further used to create tertiary colors and so on. This creates a color wheel, a visual representation of colors relation to one another.

To most people, the term primary colors suggests red, yellow and blue. However, said colors are only one of the few sets of primaries. There are a few different color models, but most widely used are RYB, CMYK and RGB, each with their own primary colors. Choosing a right color mode is very important, since each has its use and is not very versatile. Along with said three, there is also HSV color model. (Bleicher, 2012)

3.4.1.1. RYB and CMYK

Colors in RYB and CMYK color models are created using subtractive mixing. This technique uses partial or complete subtraction (absorption) of certain wavelengths of light, resulting in a color that lacks the absorbed parts of color spectrum in relation to its original state.

RYB, an abbreviation of red-yellow-blue, is a color model we have all been taught. It is primarily used in art and design, particularly painting for mixing paints. In the past, color

theories have been built on RYB primaries - red, yellow and blue, as they were considered as a standard set of subtractive primary colors. (Agoston, 1987)

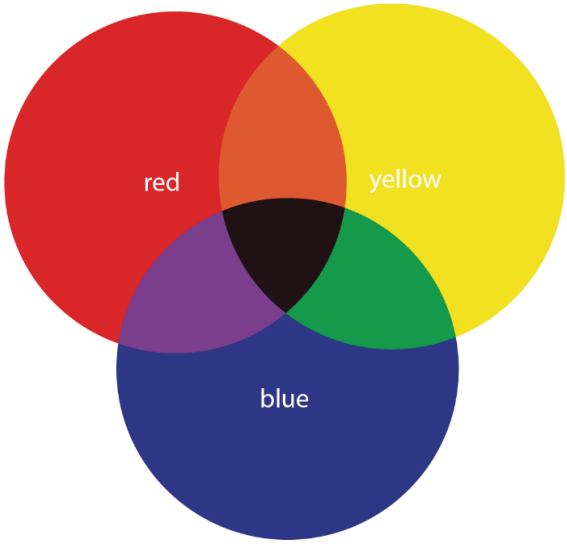


Figure 4: RYB primaries

Other color model that uses subtractive mixing is CMYK. CMYK model, that stands for cyan – magenta – yellow - key (black) is used only for printed color. Most of the colors are created using cyan, magenta and yellow, with occasional addition of black. Black gives some sort of depth to colors and is mostly used in creation of fully saturated black, since mixing other three colors does not give that result, as seen in the Figure 5. (Coleman, 2018)

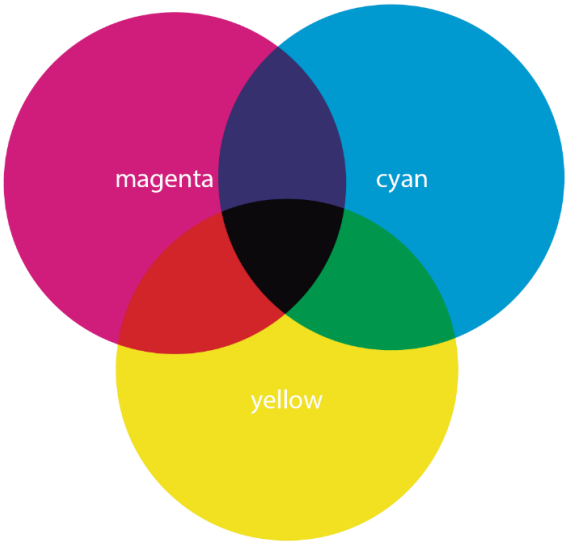


Figure 5: CMYK primaries

3.4.1.2. RGB

Color model important regarding our topic is RGB color model, which uses additive mixing. In contrast to subtractive color mixing, additive color mixing is based on addition and uses light, not pigment. Color is created by combining multiple colors, or wavelengths, in various proportions. In this case, combining all three of primaries creates white. Additive mixing is used in dealing with digital colors, meaning RGB model is based on it. (Agoston, 1987) (Bleicher, 2012)

RGB is a color model used computer display, meaning screen-based designs like digital interfaces, digital magazines and advertisements, beginning stages of video and print work etc. It is considered the most versatile out of color models. As stated, it is frequently used as a foundation for artists who are not yet sure of their products usage. Nowadays, with graphic editors, it's fairly simple to convert into a more suitable color model after the product has been completed. (Coleman, 2018) (Bleicher, 2012)

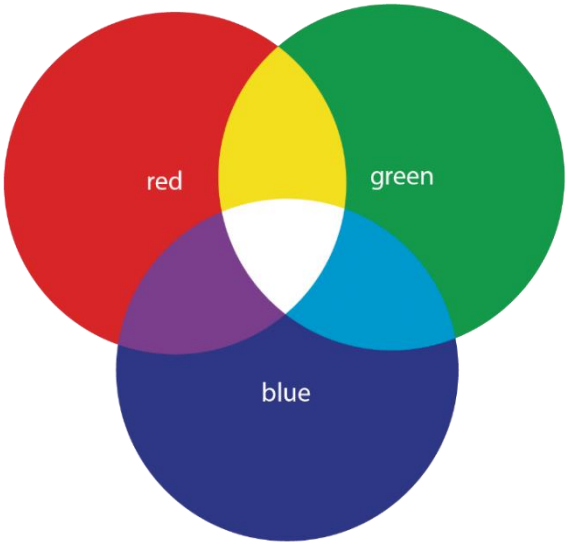


Figure 6: RGB primaries

3.4.1.3. HSV

In contrast to RYB, CMYK and RGB, which are defined by primary colors, HSV - hue, saturation and value, describes three characteristics of a specific color, perhaps the most interesting to a designer. The difference between those three terms is illustrated in the Figure 7.

Hue is a term almost interchangeable with color. Each color, or a hue, has specific meaning to it. A great designer knows how to take advantage of colors' meaning and also be

aware of the context in which user is in, and some difficulties that user might encounter. Those will be further discussed in the next chapters.

Saturation refers to intensity – how subtle or intense is a color. What people see in the color wheel is the most saturated version of a color. Saturation can change the whole feel of a certain color, making it soft and pastel or vivid and captivating. Value indicates the lightness or darkness of a color, with white being the lightest and black being the darkest. Along with saturation, it can be a strong tool for drawing attention to certain subjects.

In combination, hue, saturation and value can describe every color imaginable. Using saturation and value properly can mean a difference between having a visually pleasing interface and a bad interface with too much saturated colors or a bland look where nothing captures user's attention. (Krause, 2010) (Bleicher, 2012) (Cooper, Reimann, Cronin, & Noessel, 2014)



Figure 7: Hue, Saturation and Value

3.4.2. Digital color

As stated, RGB color model is used for digital purposes. On computer screen, color is created by combining various percentages of the three primary colors – red, green and blue. Having them all at 100% results in white colored screen, while 0% of each color gives fully black screen. Value of each primary colors range from 0 to 255, with 255 being the maximum of that given color. Color made by combining these three primaries is represented by a hexadecimal value, a sequence of six bytes. However, given the technical properties of a specific machines and screens, colors can display differently. An example for this can be seen in the Figure 8, which shows color red in the color picker tool in Photoshop. (Krause, 2010)

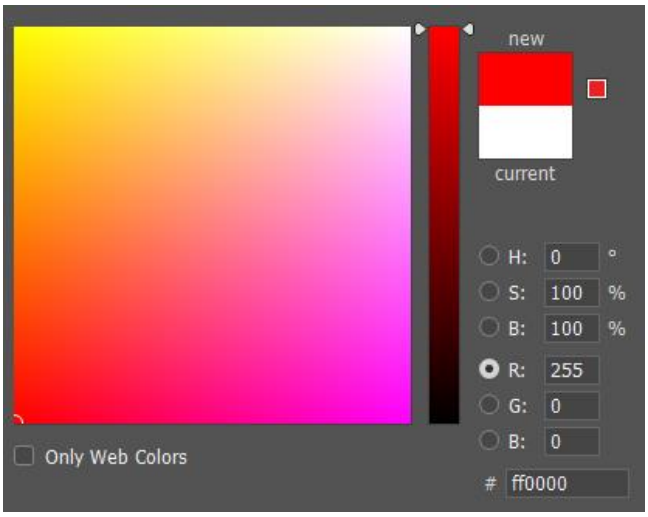


Figure 8: Pure color red with its RGB values

3.4.2.1. Technical limitations

Humans can differentiate about 10 million colors. As for monitors, it varies. In the past, monitors could display as little as 256 colors (8-bit). Technology has progressed, so nowadays we have monitors with 16-bit, 24-bit, 32-bit and more color depth. 24-bit monitors are able to display around 16,7 million colors, which is a lot more than humans can differentiate. That is why saving a picture intendent only for viewing in more than 24bpp seems a bit excessive. Only people who deal with graphics professionally may opt for 32-bit or larger, to get more defined tones when rendering down. (Bleicher, 2012) (Kyrnin, 2018)

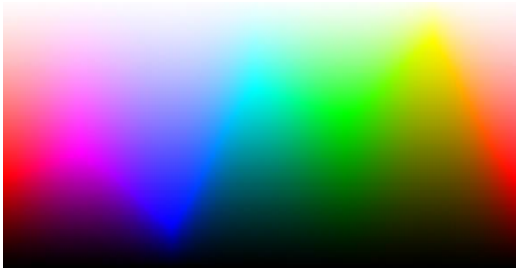


Figure 9: 24 bits per pixel (Source: Cambridge in Color)

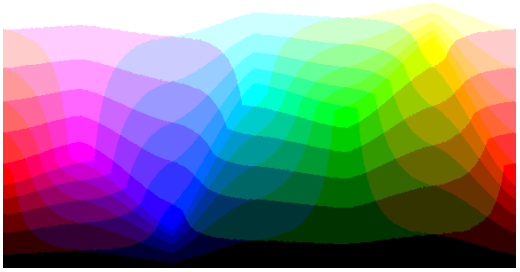


Figure 10: 8 bits per pixel (Source: Cambridge in Color)

The smallest color space out of three is the web color space. Web color space consists of web (or browser) safe colors, referring to colors that display exactly the same on any computer monitor. While it would be logical for there to be 256 (8-bit) colors, there are only 216

of them that display the same on all computers with many different platforms. It's not just a question of display, but of RAM, video/graphics cards and internet speed. However, as mentioned, technology has come so far that computers today can display millions of colors. Furthermore, internet speed has gone so far up in the last 20 years that there is no need of limiting colors because of download speed.

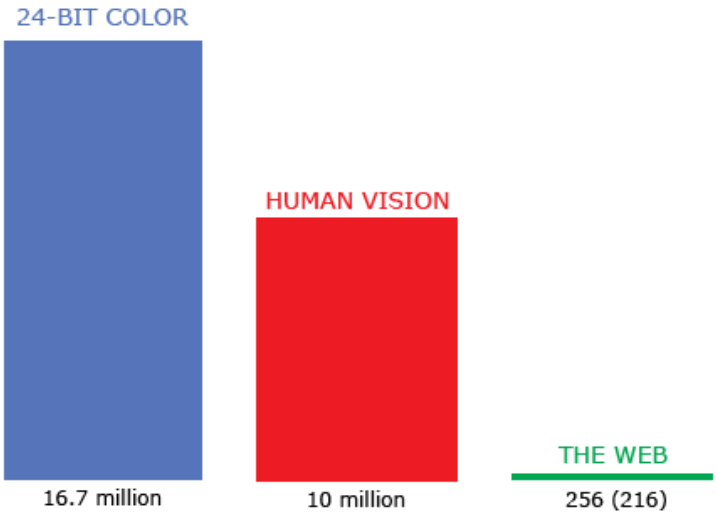


Figure 11: Color spaces

So, are web safe color still relevant today? It depends. There are still a lot of older computers that are have limited displays, so some designers still chose to play it safe and go with web safe color to ensure that their visuals look great on any device. In addition, every color other than those safe 256 colors is larger, so it may slowdown loading. (Bleicher, 2012)

This is where designer's and developer's choices come in. Do you think that the main part of your intended audience still uses displays that can only show 256 colors? If not, maybe there's no need for color limitations. With only 216 colors, web color space limits artists and designers. Today, many graphic software have built in options for showing only "web safe" colors, which makes it easier for designers to create designs safe for web. Depending on a type of an interactive product, average users might not really need or care about color quality. That's why it is important to determine needs and technical abilities of our targeted audience and make decisions based on that. (Krause, 2010)

3.4.3. Psychological use of color

Color preferences and responses often vary from person to person, whether because of personal or environmental factors. Colors evoke emotions in us, and those two are very closely related. They are extremely important in culture and our lives, which means they are also important in product design. Choosing a color or multiple colors to represent your brand is not a simple task. In addition to thinking about applying color theory, designers must also understand a meaning behind a certain color and how it might affect the users in order to get a desired response. (Coleman, 2018) (Bleicher, 2012)

3.4.3.1. Color and emotions

As said before, each color can have a different effect on a person. It depends on our personal experiences, cultural characteristics, context, personal preferences and what not, and cannot be universally transferred to an emotion. Generally, however, each color has its association. For example:

- Red – Excitement, importance, power
- Orange – Friendliness, cheerfulness, uniqueness, energy
- Yellow – Optimism, happiness, enthusiasm
- Green – Peacefulness, growth, stability, health
- Blue – Safety, trust, strength
- Purple – Creativity, luxury, mystery
- Black – Power, sadness, sophistication
- White – Cleanliness, simplicity, virtue, neutrality

Many studies looked at preferences of a single colors' hue. Most suggest blue are grey are the most favorable colors for interfaces, whereas yellow was the most disliked. However, not so many focused on saturation and brightness. Those that did, had conflicted results, as those experiments done in a controlled setting showed that most people prefer saturated colors, and those done "in real life" showed that they find those colors distracting. As for brightness, studies found that people preferred interfaces with higher brightness, and that brightness was more important to them than hue and saturation. People also seem to prefer simplicity over colorfulness. (Seckler, Opwis, & Tuch, 2015) (Bleicher, 2012)

A research done by Satyendra Singh from 2006, found that nearly 90% of snap product decisions are sometimes made due to color alone. (Singh, 2006). In general, visual factors,

and especially colors, are what persuades customers into buying certain products. In e-commerce color can be, of course sparingly, used as a way to hasten a purchase. (Swasty & Adriyanto, 2017)

3.4.3.2. Color and context

Meaning and use of colors is often not the same in different cultures. In India, it is common to use red for weddings and white for funerals. However, western countries instead opt for color white for weddings and black for funerals. In China, red is associated with happiness, whereas in the States it's with danger. In a study that was done to determine color preferences in eight different countries, some colors were more consistent across cultures than others. Blue and black were among colors that were viewed similarly in all countries, with all associating blue with peacefulness and calmness, and black with sadness and staleness. Yellow and orange on the other hand, had different associations across cultures. Blue is also usually considered the most universally positively perceived color. These kinds of differences can evoke different reactions, depending on a context of users. Designers should, especially when dealing with sensitive topics, should have their users' social context in mind, since they might have different responses to a color pallet of an interface. A characteristic of a successful visual design is also it's sensibility to cultural meanings. (Bleicher, 2012) (Cyr, Head, & Larios, 2010) (Ionel & Petrescu, 2010)

Designers should also thing about using colors that represent the company, a person or a product they are designing for. It may be related to their goals, standpoints and origin or represent their field of work and a product or a service. Blue, for example, is associated with water and sky, so it might be a good choice for boat excursion company. Green would fit nicely into a hiking society, since it is associated with nature. Lots of brands even have color that they are associated with, like Starbucks is associated with green, Nikon with yellow, McDonalds with red and yellow, Yahoo with purple. It makes sense to it, at least as main color of a color scheme.

Same colors may also have different meanings in different professions. Men and women view colors differently, and so do different generations. It is widely believed that men prefer darker, more saturated colors, in contrast to women, who prefer soft, desaturated pastel colors. While this might be true in many cases, it is not a rule. Women also pay more attention to color than men do. A color red might be great for teenagers but might be tiring for older people. (Bleicher, 2012) (Ionel & Petrescu, 2010)

3.4.4. Aesthetic use of color

Along with other mentioned things, designers' biggest assignment is making an interface visually pleasant and easy to communicate with. That is best done with carefully selected color palette and not overdoing it with the number of used colors. Color palettes are made by implementing knowledge of color harmonies and how each color reacts with its surroundings. (Cooper, Reimann, Cronin, & Noessel, 2014)

3.4.4.1. Color harmony

To best explain color harmony, we go back to the color wheel, shown in the Figure 12. Color harmony is about combining hues to find the ones that work great together in a composition. There are a few color scheme formulas to help designers to do so, but those should be taken as a base to inspire and help designers, rather than a strict rule. Neutral colors like white, black and grey can help complement more vivid colors and make them stand out more by balancing out the design. Starting with the base, designers usually expand their color schemes by alternating saturation and value. This is why examples will be shown as a group of five colors, with added saturated or desaturated versions of colors.

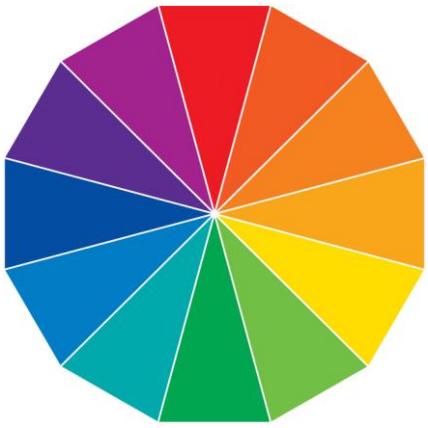


Figure 12: Color wheel (Source: Color Index)

The first one is monochromatic color scheme, an example of which is shown in the Figure 13. Rather than using multiple colors, monochromatic color scheme uses only one. The basis for this method is HSV – hue, saturation and value. Once the hue is picked out, variations of it are created by altering saturation and value of it. Monochromatic color scheme creates a cohesive look, works the best if already one memorable color connected to a company or a brand, and makes designers' job so much faster, although it can appear as boring at times.



Figure 13: Monochromatic color scheme (example)

Analogous color scheme is, along with monochromatic, the easiest one. Colors in this palette are next to each other on the color wheel – green and blue are analogous colors, and so are red, orange and yellow. This creates comfortable designs with colors that usually match well. However, this color scheme sometimes might not be the best solution. Because of how similar the colors are, they can sometimes almost blend into one another, depending on their saturation and value, so it is important to make sure there is enough contrast. An example for analogous color scheme is shown in the Figure 14.



Figure 14: Analogous color scheme (example)

Triad color scheme uses three colors that are evenly spaces out in the color wheel, forming a perfect triangle. They tend to be quite vibrant, like shown in the Figure 15, especially when using saturated versions, so it's best to use them sparingly and let one color dominate over the others.



Figure 15: Triad color scheme (example)

Complementary color scheme consists of colors that are complete opposites regarding hue and temperature. This approach represents the highest amount of contrast in the color

wheel. Because of this, they make each other appear more intense, like colors in the Figure 16 do.



Figure 16: Complementary color scheme (example)

Split complementary, or compound color scheme, is the last color scheme that's going to be mentioned. It is similar to complementary color scheme, but instead of using a color and its complete opposite, it uses a color and two more colors on both sides of the opposite color. This forms sort of an "Y" shape in the color wheel. This method is used as an alternative for complementary color scheme, since it gives an additional color to work with. An example for split complementary color scheme is shown in the Figure 17. (Bleicher, 2012)



Figure 17: Split complementary color scheme(example)

Nowadays there are many digital tools that help designers pick best suitable color palette. Tools used in examples above are Adobe's color scheme generator on Adobe Color CC page and color wheel and color schemes generator on W3Schools website.

3.4.4.2. Color temperature and saturation

Most used warm colors are red, orange and yellow. Colors like blue, green and purple are considered cold colors.

With warm colors tendency to bring the attention to themselves and cold colors sinking back more, designers can use that to draw attention to certain interesting or important areas. Similarly, more saturated colors usually act as warmer colors, brining attention, while less saturated colors tend be softer.

However, it is important to use these techniques with human eye in mind, to that ensure readability of your interface. Saturated colors do grab attention but can be hard to look at for a

long period of time. With balanced saturated and unsaturated hues, human eye can rest, making the interface much more pleasant.

In addition, use of cold or warm colors and different saturation levels should be considered in a context of an interface. Using cooler and less saturated colors will ensure professionalism, while using warmer and more saturated colors will give of a fun and modern vibe. (Bleicher, 2012)

Simplistic designs with one predominant, vibrant color are becoming more and more popular, but they cannot be used for anything. They are best used on interfaces that rely more on graphics than on text. As mentioned before, reading with these kinds of colors surrounding the text can be unpleasant, so it's best not to use too much vibrant color palettes on web stores, newspapers, forums and so on. Designers should be careful, if they do use a vibrant color as their base, to pair other colors well and make sure that this kind of style fits the company. (Clark, 2002)

3.4.5.Examples

Designer of the website shown in the Figure 18 used two complementary, vivid colors – blue and red/orange, to create contrast and bring attention to the illustrations throughout the whole page. All illustrations on the page use those two colors and a few of their shades. Since both colors are extremely noticeable and saturated, white is used as a background and black is used for most of the typography. Because black and white are basic colors, the color scheme is not too colorful, and everything fits nicely together. The entire website gives of a modern vibe and fits into companies' description of themselves – quick, convenient and accessible.

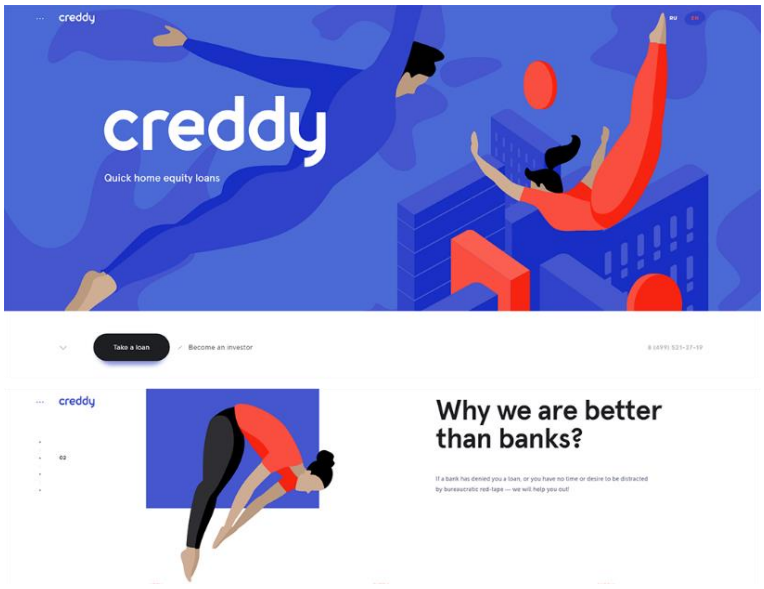


Figure 18: Creddy (Source: en.creddy.ru)

Airbnb's website, shown in the Figure 19, relies more on the lack of color than on its abundance. Airbnb is a travel website and its design is optimized around that. It's minimal and straightforward and that's what makes it functional. There isn't much to say about this color scheme. Most of it is white with a few accent pieces colored in its recognizable coral shade paired with teal. This allows text to be easy to read and pictures easy to see. Simplistic color scheme and overall design leaves attention where it should be – on the content.

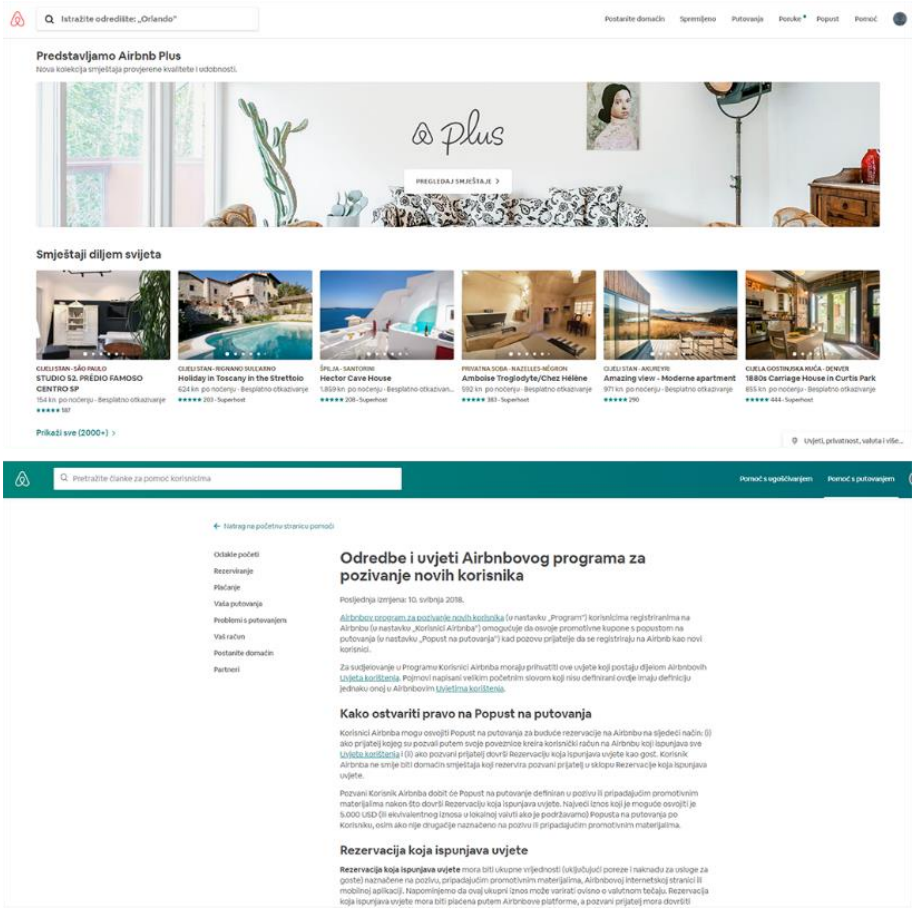


Figure 19: Airbnb (Source: hr.airbnb.com)

The next example, on Figure 20, uses only one extremely bright and saturated color – yellow. What makes this approach work is the content of the website. Not all pages contain bright yellow background, and ones that do contain minimal amounts of text and/or use imagery and white elements to break the monotony and help make text more readable. Contrast of a black text in the context of white and bright yellow allows it to draw attention and. Pages that do not have bright yellow plastered on the entire background are instead filled with a single simple image that's half covered yellow at reduced opacity. To keep up with the color

scheme, designer used mostly neutral toned image, which again allows the use of yellow, this time to accentuate important links and help with the readability of the text on the picture.

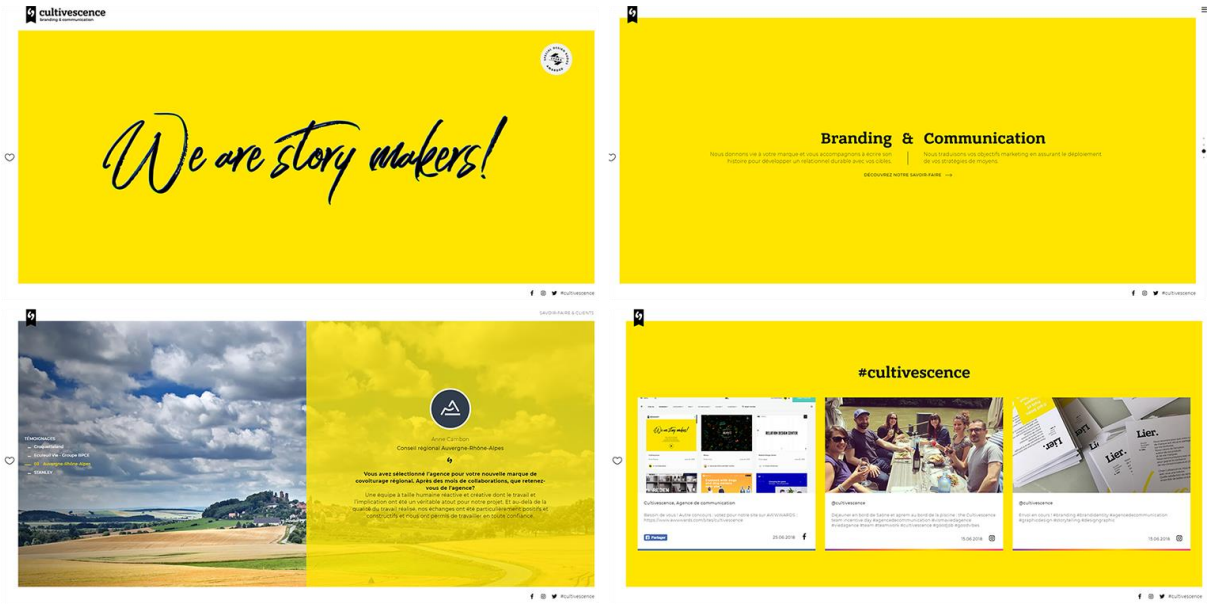


Figure 20: Cultive Scence (Source: www.cultivescence.com)

For clearer example of how businesses try to build their interfaces around their demographic, the Figure 21 shows a website of a brand that makes bridesmaids dresses. Designer of this website used soft, pastel and light colors to appeal to brands costumers - women.

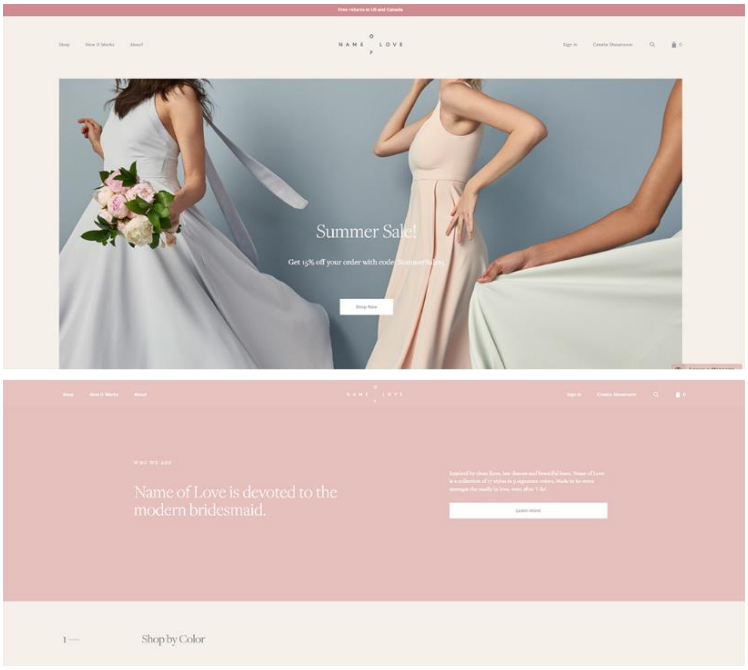


Figure 21: Name of Love (nameoflove.com)

3.5. Typography

Typography is a style or appearance of a text. It's everywhere around us – in books, on street signs, products, websites and many more. In the sense of interfaces, it is one of its most crucial components. It's one of the first things users notice. Typography sends a message about the purpose of the content. While picture can be worth a thousand words, a couple of words can also show what no number of pictures can. Good typography is about finding a balance between esthetics and utility. If typography fails, design is bad, no matter how good the color scheme is, or content, interactions or your code. (Santa Maria, 2014) (Cooper, Reimann, Cronin, & Noessel, 2014)

3.5.1. Typeface

A typeface is another word for font family – a set of fonts that share common design features. There are many types of fonts. Most of them are rarely used in desktop or mobile interfaces, but in other, more expressive design medias.

Because of how creative fonts can be, there is no one universal classification. One of the most well-known classification in Vox classification, which can be broken into classicals, moderns and calligraphies. Further trying to categorize font families are digital companies like Adobe, who tried creating their own systems of classification.

Most people think of serif and sans serif fonts, which is the most common classification of Latin letter styles. Important to mention in this context are also display typefaces. (Garfield, 2012)

3.5.1.1. Serif / Sans Serif

Serif fonts are characterized by short decorative lines on the tips of the letters. Those make letters appear more traditional, carved. On the other hand, sans serif fonts don't have those decorative lines, so they appear more simplistic, contemporary and less formal. Figure 22 illustrates their differences.

Serif vs. sans serif is one of the ongoing debates of visual interface design. Designers often use both typefaces, which gives them a sense of dynamic and makes things interesting. The most popular combination is using large size serif fonts in headlines and sans serif fonts for other text. However, there are designers who also use sans serif fonts in headlines and serif fonts for body.

It has long been debated which one of these fonts are more readable. Generally, serif fonts are more readable on printed media, while sans serif fonts are still preferred on screen

designs. Preferences for serif fonts may often because of a habit, since those have been around the longest and are found in newspapers, books and so on. However, that should not deter designers from using serif fonts if they want to, since increasing screen resolutions and subpixel rendering now allow for them to be displayed properly and read on screen without a problem. If you do plan on using serif fonts, safest bet is using them for text that's larger than 10 px, since sans serif fonts are far more readable than serif in small type.

Decision is usually based on a preference and interface context – old magazines and newspapers with tradition often use serif fonts for their web site's body, thinking it makes it more readable and nostalgic because of serif's use in printed versions. In 2012, sans serif's popularity for headlines has seen a decline, although they are still more popular than serif fonts. In the same year, only 34% web sites used serif fonts for body.



Figure 22: Serif (Times New Roman) and Sans Serif (Verdana)

Among most popular sans serif fonts are Arial, Verdana, Helvetica, Tahoma and Lucida Grande, while serif ones are Times New Roman, Georgia and Baskerville.

Popularity of sans serif fonts on web might also be due to fact that most designers still rely on web fonts, which have far more sans serif options than serif. On the other hand, sans serif's decline in popularity in recent years is due to new web font embedding tools and new CSS font properties, which makes it easier for designers to pick from bigger variety of serif fonts. (Smashing Magazine, 2012) (Garfield, 2012) (Cooper, Reimann, Cronin, & Noessel, 2014)

3.5.1.2. Display typefaces

Display typefaces are fonts used on fewer words at larger scale for displaying important messages and headlines, rather than big bodies of text. Their designs are "less boring", meant to draw attention to themselves and are more variable than standard ones, as shown in the Figure 23. Letters are often more densely spaced, have subtle detailing and ornaments. Display fonts can be serif or sans serif, they can be really thin or really bold, modernist or traditional, mimic handwriting – there is a wide range of possibilities.

They are found on more graphic heavy designs such as posters, magazines, logos and many other. Yes, they are also meant to be read, but are usually used for a small number of words and their main purpose is to set a visual tone for an interface. With display fonts, less is more, and they should be used sparingly. Display versions of serif fonts may give out an elegant vibe, sans serif display fonts will add modernist touch, and more decorative fonts will add creativity. (Willen & Strals, 2009)

Some of the more popular fonts unique to display typefaces are script fonts - inspired by calligraphy and handwriting, blackletter - inspired by gothic period, graffiti, art deco, and many others.



Figure 23: Display fonts

Using these kinds of decorative, unique fonts along with standard, simplistic fonts can accentuate certain parts of an interface and make things less bland and boring. (Smashing Magazine, 2012)

3.5.2. Typography guidelines

A wide range of typefaces allows designers to experiment with different styles. Text, along with images, is without a doubt the most important aspect of an interface. No matter how well designer it is, if an interface does not serve its purpose – providing information – then it's not good. Here are some guidelines to help you create an interface with typography that's going to make it easy to read, scan and to find necessary information.

3.5.2.1. Contrast and color

Colors of text and background should not be complementary colors, since that creates not enough contrast and makes the text hard to read. Some color combinations can also be extremely unpleasant for the eye. The safest color combination is black letters on white background. Good options are also black letters, or any darker colored letters, on light background. Some examples can be seen in the Figure 24. (Cooper, Reimann, Cronin, & Noessel, 2014) (Smashing Magazine, 2012)

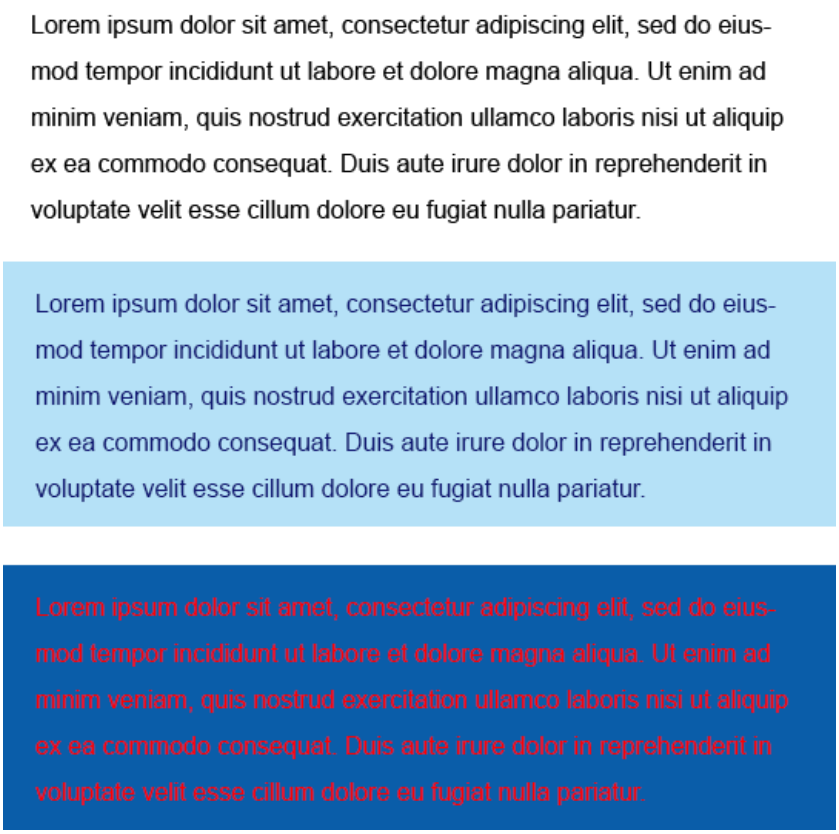


Figure 24: Text and background contrast

3.5.2.2. Hierarchy

A good content is nothing without good typography and structure. A well-defined hierarchy will make text readable, scannable and information easy to find. Content should be divided into sections and labeled with smaller headings, to break down big chunks of text and make website more scannable.

On top level hierarchy there is the main headline. Hierarchy goes from that, to smaller headlines, to body text and other elements like date, information about author etc. It's not hard to get it right, since some type of hierarchy is everywhere around us, but it is extremely important. The rule is, text elements on the top of the hierarchy are the largest, and as the

hierarchy lowers the text is smaller. There aren't really exceptions to this rule and it should be followed if a goal is to make a good interface. (Smashing Magazine, 2012)

3.5.2.3. Appropriate typeface and size

As mentioned, general rule is using sans serif fonts for larger bodies of text and/or for smaller sized text, since they are considered to be more readable on the screen. If you do plan on using serif fonts for the majority of your text, make sure to make the font big enough. Decorative fonts are best used for display purposes, as larger fonts, to accentuate something important. It's also important to mention that font style sets the vibe for an interface. Serif fonts give out elegant, traditional vibe, sans serif fonts are more modern and simplistic, and display typefaces have many vastly different styles.

Text size depends, but most often body text is around 12 px. Sizing headers appropriately is also important, since too small headers don't draw attention to themselves, and too big headers surrounded with large amounts of content can be too much. (Cooper, Reimann, Cronin, & Noessel, 2014) (Smashing Magazine, 2012)

3.5.2.4. White space, margins and density

White, or negative, space is a part of an interface that is not occupied by anything. On this free space there is no text, no pictures nor any other graphical elements. White space is extremely important in keeping the layout clean, easy to go through and organized. Since the space is empty, is also draws the attention to the text.

Margins are white space elements that separate bodies of text from each other, help define it, separate different elements within the article, such as headline, main text and information about date and author, as well as separate text from other design elements.

Depending on what you consider to be white space, it also goes hand in hand with density. Density of text in amount of words placed in one area. Designers should be careful with line height, font sizes and letter spacing.

Whitespace gives readers time to rest their eyes and to look for information that is important to them. A smart idea is using bulleted and/or numerical lists instead of text heavy bodies, to make it look more organized, less dense and more scannable.

All in all, all elements should be nicely separated, text should not be too dense, but also not too loose so it loses sense of unity. Bad and good example of whitespace and density use is shown in the Figure 25. (Smashing Magazine, 2012)

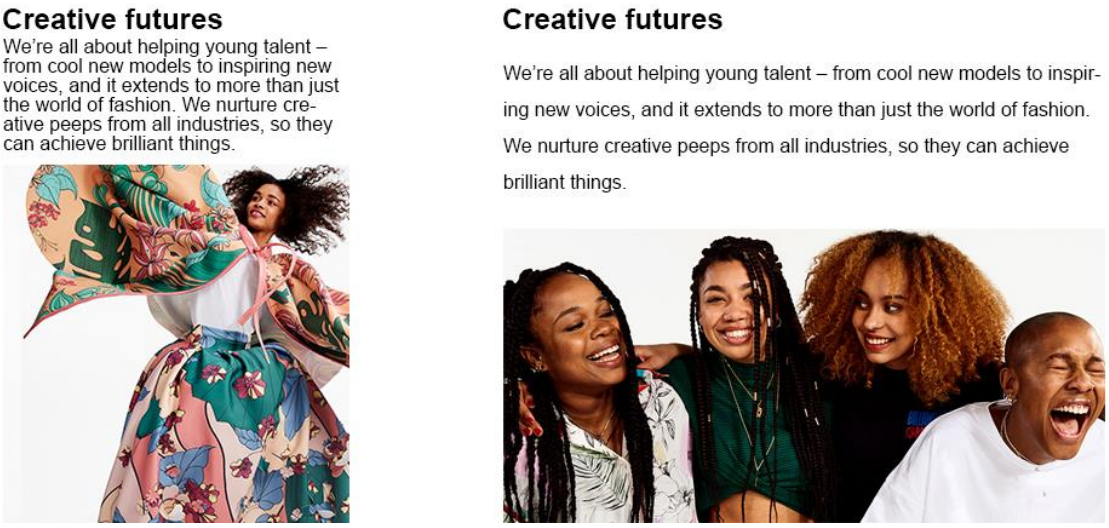


Figure 25: Bad and good usage of whitespace and density (Source: www.asos.com)

3.5.2.5. Consistency and diversity of font styles

Consistency in design creates a user-friendly interface. Consistency in text implies using same font, color and size for all textural elements in the same hierarchy. Making all headers on the same level of hierarchy look the same helps users with organizing the content and finding what they are after.

That being said, it's best to limit yourself to one or two fonts per interface. Some designers use three, but everything above that is usually excessive, although there are cases where it might work. To avoid having more than necessary number of different fonts but still having diversity, use different sizes and colors on same fonts. (Smashing Magazine, 2012)

3.5.2.6. Writing style

Other than previously mentioned design elements, content of your text is extremely important. Designers don't really have a say in what kind of text content client supplies, but they could give out a few guidelines. Text should be comprehensible while not using an excessive amount of words. The less text the better, assuming the message is still conveyed and clear. As mentioned before, using bulleted and/or numerical lists is a good way to make your text less heavy. (Cooper, Reimann, Cronin, & Noessel, 2014)

3.5.2.7. Emphasis on important elements

Now, emphasis can be put using design techniques and writing style, and it is very important do to so in order to break monotony and help make text more readable/scannable. Bolding, using italic, highlighting, changing the color, showing quotes, underlining and

enlarging are a few options. Along with that, having a good text that matches previously mentioned guidelines helps in emphasizing important elements. (Smashing Magazine, 2012)

3.5.2.8. Text alignment

There are four main alignment types – left, right, center and justify, each illustrated in the Figure 26. Designers usually avoid using centered text on interfaces. While it still might work in some cases, centered text is usually reserved for wedding invitations and other events. Centered text is hard to read and track, and it also might end up messing up the rest of your design. Most used and most readable alignments are left alignment and justify, so it's probably better to stick to those. (Web Designer Depot, 2009)

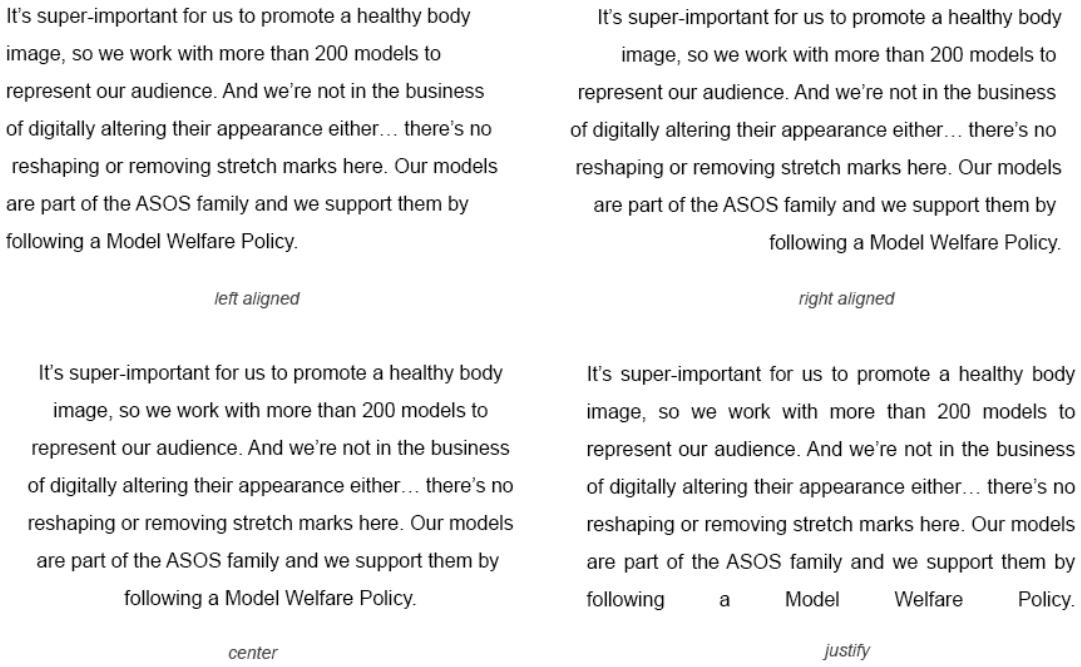


Figure 26: Text alignments

3.5.2.9. Bad fonts

There are some fonts that just should not be used in any sort of interface. Some surveys say that people don't seem to like standard fonts like Times New Roman or Arial. Using those two fonts might make it look like you didn't put any effort into typography of the website.

There are others that topped the lists and are generally considered just bad. As an example, Comic Sans has long been considered the bane of interface design, given its childish and "comic" nature. This font might make people not take you seriously, as it gives of unprofessional vibe. Other fonts mentioned are usually display fonts, like Brush Script and Grunge Fonts. (Garfield, 2012)

Arial and Times New Roman are still used; however, more and more designers are finding alternatives for them in other similar serif and sans serif fonts. Arial is quite similar to Helvetica, perhaps today's most used font on the web and in general, as well as Futura. Times New Roman can be replaced with fonts like Georgia, Roboto Slab, Adriane Text and many others. (Slide Bean, 2017) (Hype For Type, 2017)



Figure 27: Some least popular fonts

3.5.3. Examples

As stated, mixing serif and sans serif fonts is a great way to bring out a dynamic to an interface. In example shown in the Figure 28, most of the text is in sans serif style, with some part in serif and decorative style. White text is fairly visible against dark, vivid blue background.

Hierarchy is quite interesting in this example, as there are no clear headlines but parts of text that designer wanted to accentuate and did so by using different fonts and sizes. The intro text is the biggest and is in serif style, making it stand out even more. It seems like the same serif font is used for the main navigation at the top but in much smaller size. The

paragraph bellow the intro text is in sans serif style and much smaller. Taking one step further, we have another paragraph that is clearly the lowest in hierarchy out of three. That is clearly seen in his smaller font, less bright color and two rows.

Another typeface is seen at the top left corner, where we see website's name written in decorative display font. The entire website's typography is well spaced, with enough "white space" in between different paragraph and letters, and there isn't too much text. Even though more than three different styles of text are used, the simplicity of the rest of the website and the same two colors across all of them, evens it out.

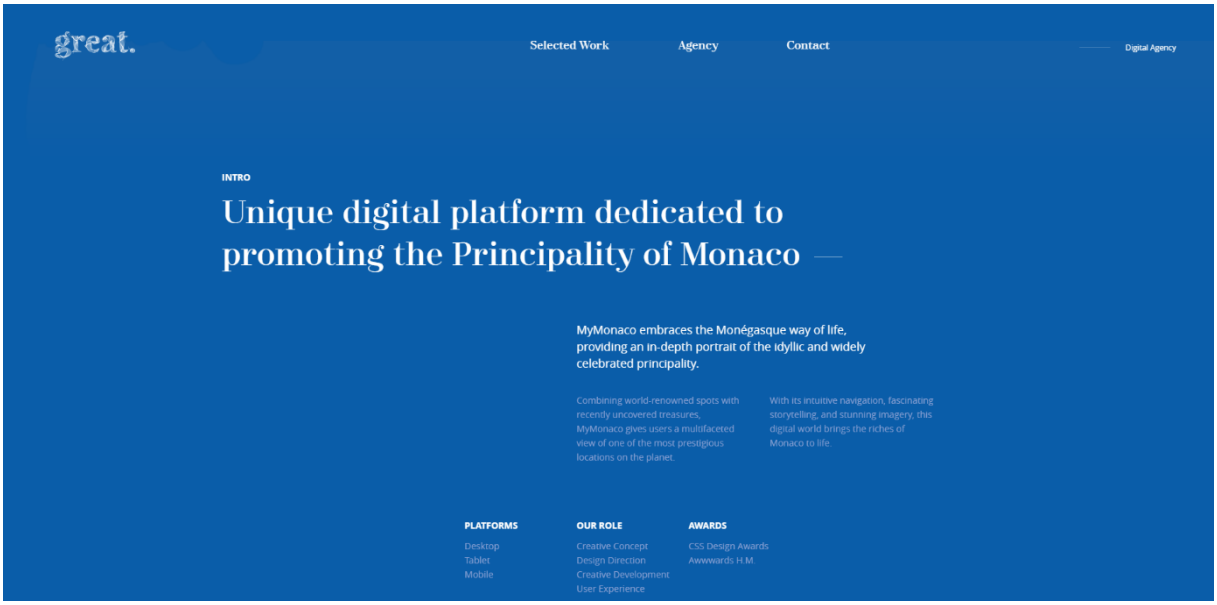


Figure 28: The Great (Source: www.thegreat.agency/my-monaco)

On the contrary, Figure 29 is an example of predominant usage of serif fonts. In this case, sans serif fonts are used to put attention to the biggest headlines and to differentiate navigation for subscription and log in from other smaller headlines on the site. The rest of the website is mainly written in serif font. Many sophisticated newspaper and magazine sites, like The Times, use serif fonts in their article headlines and in the text, as it gives out a vibe of printed versions.

Observed example is a newspaper website, which means text is its most important attribute. There's a lot of it, but different techniques are used to separate main news from less important ones and from other articles. Main articles are at the top of the page and are accompanied by the biggest picture and biggest fonts. They are also the only hierarchy level that has bolded sans serif font in their headings. At the bottom of the page there are miscellaneous articles whose headings vary in size, depending on the space the articles

preview takes up. Some of these also have second heading that is, along with basic text, colored less dark grey rather than black as the main heading of the article. In between these two levels of articles, there is also a space with some other miscellaneous previews of articles that have much shorter and smaller heading, text preview and image.

For accentuating important parts of a text, the website keeps it classy, meaning that it does not really rely on color to highlight important words in an article. Instead it uses italic style and underlining links, including links to their articles that previously covered some story mentioned in this one. Other than using bright blue buttons with bolded sans serif letters in it, there is one more use of color. Articles that take up most of the bottom part of the main page have links to the full story painted in red, making them pretty visible.



Figure 29: The Times (Source: www.thetimes.co.uk/)

3.6. Orientation

Directional cues serve the purpose of showing the orientation. Whether it's showing some sort of a directional information, controlling the eye movement of users or showing them where to go next, directional cues are important. Successfully implementing them increases usability and user experience with time saving.

All sorts of elements can serve as directional cues. Most obvious ones are pointers such as arrow, but there are also buttons, lines, pictures, hierarchy, colors and many more. Graphs, such as stock market graphs, use arrows. They usually also use a color, with most of the times red indicating downwards orientation and green upwards orientation. Buttons indicate a direction in which the users should go. Pictures can be used as cues too, depending on their composition and elements – especially body language of people on the photo. Human eye will also look for colors that stand out from the rest when looking for a direction. All these elements are not just aesthetic tools and not thinking about orientation when picking them can lead to confusion. Make sure to build a foundation with good navigation, information architecture and structure of an interface. (Sandu, 2017) (Hussam, 2012) (Cooper, Reimann, Cronin, & Noessel, 2014) (Schenker, 2014)

3.6.1. Examples

In the first example, shown in the Figure 30, the gaze of a person on the picture draws the attention to the text on the right.

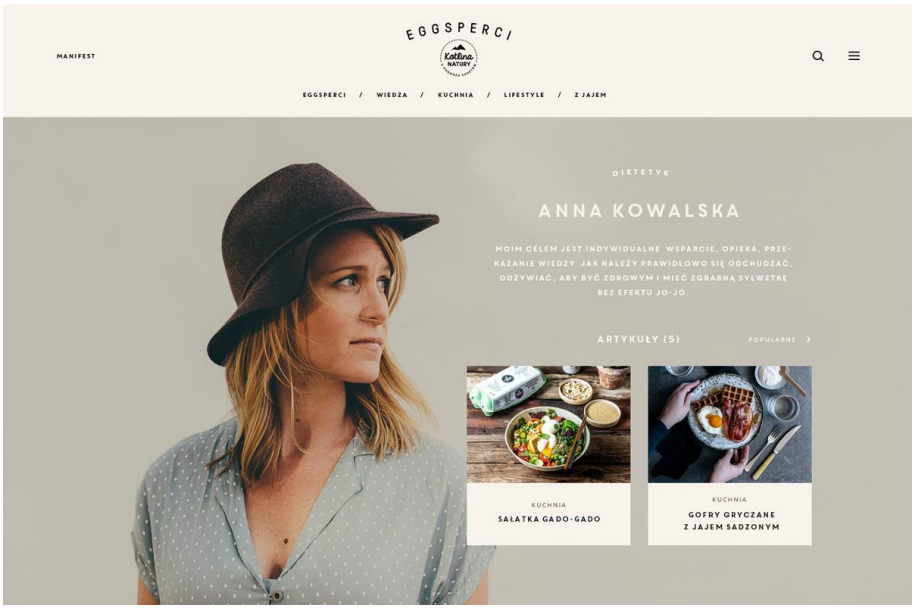


Figure 30: Katlina Natury (Source: www.behance.net/mjakobsze)

In the second example, shown in the Figure 31, the “play” button in the middle encourages users to click on it to see a video that will sum up what the page is about. A yellow line down the middle of the page guides the user to scroll down the page for more content. The way illustrations are situated also indicates that there is more content hiding bellow.

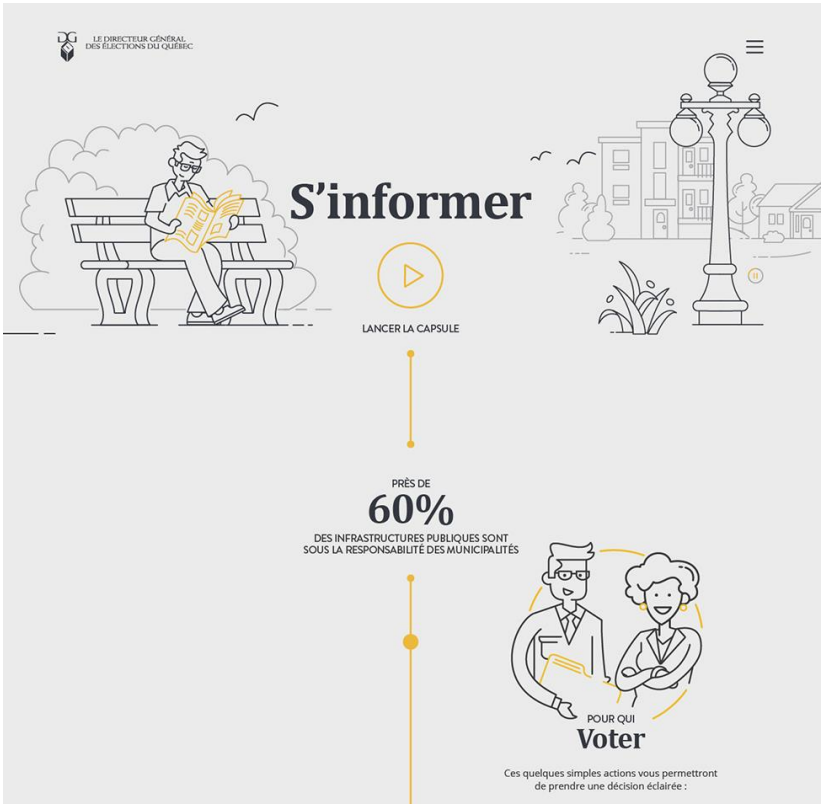


Figure 31: Élections Municipales 2017 (Source: https://www.behance.net/pulse-design)

3.7. Position

Position is another element important for, not only aesthetic purposes, but also for the content of an interface. Together with size, position is extremely important for good hierarchy. Element higher in hierarchy is usually on the top, while those lower are bellow. Position of element, or their proximity to each other, also shows their relationship. Related items are grouped together, such as blocks of text or images with similar subject. Elements that are not similar should not be grouped together and should be separated, either with white space alone or also some other tool, like shapes and colors.

People have reading order, in most cases from left to right then down, but that’s not universal. If there’s nothing else catching their eye, they tend to focus their attention to the top left corner of the screen. A method called Gutenberg diagram is used on desktop interfaces

when a user is just scanning a page. It shows how human eye if first drawn to the top left corner, then it goes diagonally down to bottom right, then starting up on the right corner and then diagonally down again to the bottom left corner. That is why, for example, Google places their advertisements at the top right corner of search results. On smaller screens, users can start at the top left and just scan down, since the screen is not wide. (McKay, 2013) (Cooper, Reimann, Cronin, & Noessel, 2014) (Coleman, 2018)

Position is also not always fixed, meaning that elements can change position and size. It depends on screen size, on scrolling, zoom and other factors. There are four types of positioning – static, absolute, relative and fixed. If designers are planning on creating a responsive design, which is advisable, they will also need to advise the developers and create alterations in design for different screens. (Froont, 2015)

3.7.1.Examples

Google's add placement on their result pages are strategic. They are mostly placed on the top left, above all other non-sponsored results, as you can see in the Figure 32. As mentioned above, reason for that is user's eyes almost always land on the top left corner of the screen first, so Google ensures that the adds they've places will be seen first.

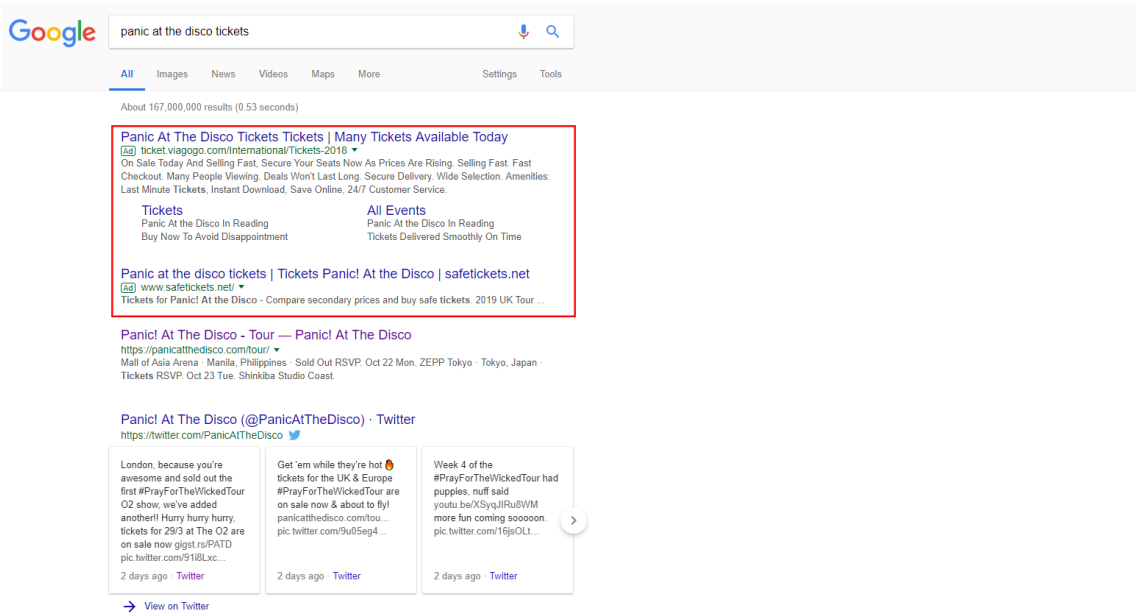


Figure 32: Google (Source: www.google.hr)

In the example in the Figure 33, there are obviously a lot of elements. However, all the similar ones are grouped together and share the same design characteristics, clearly indicating their relationship.

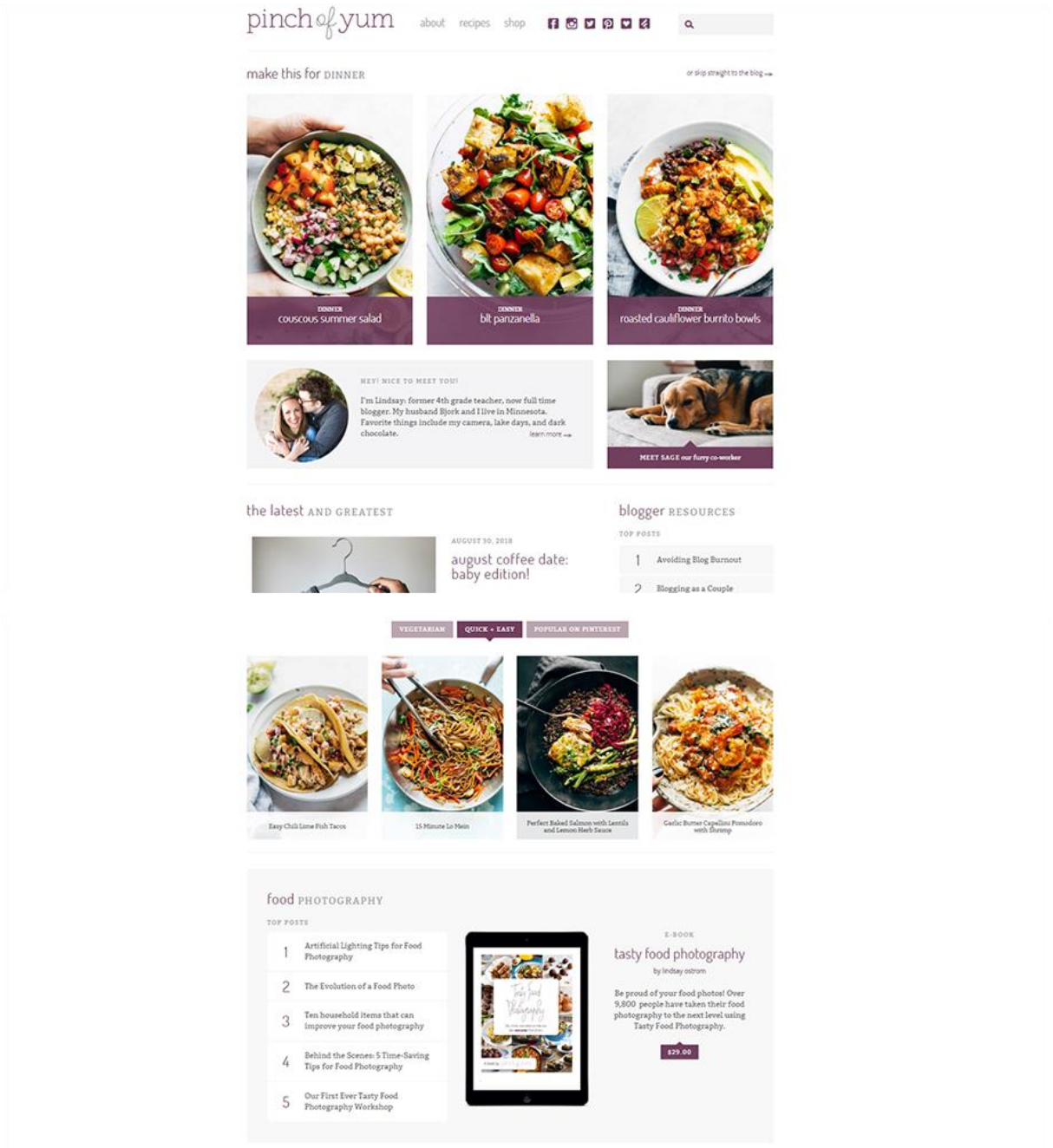


Figure 33: Pinch of Yum (Source: pinchofyum.com)

3.8. Texture

Texture can make things interesting, but you don't really think about it in terms of elements on the screen. They don't have real texture, but there is certain way to make it look like they do. When textures first found their way into interface design they were vintage, messy and cliché. Today textures are much more refined and professional looking.

They are used for additional visual interest on certain elements of an interface – background, buttons, shapes or typography and more. They can be paired with monotone color palettes to break down block of color. Often, they are used to help create a consistent tone and feel of an interface, making it feel retro or creating a look that would fit a furniture company with wood textures.

A simple background textures are the best way to add some texture to your interface, with bonus creativity points if they are related to the content of an interface. They can also be faded, content-related images that are incorporated into the background, or a pattern made by mixing multiple tones within the same color palette, or a gradient.

One of the most used background textures in interface design today is noise. Noise is a very subtle way of adding textures and is often almost not perceived as a noise, yet it turns solid one-toned color into a color with natural variations of brightness. (Brown, 2012) (Cousins, 2018)

Letterpress is an interesting way of adding texture to the text. It's been a standard way of printing since the beginning of printing press until mid-20th century. On the screen it can be easily recreated by adding inner shadows to letters, as seen in the Figure 34. It adds depth and an interesting twist to typography while still maintaining readability. (Smashing Magazine, 2012)



Figure 34: Letterpress

3.8.1.Example

This wooden furniture store, shown in the Figure 35, has a quite appropriate website. Various wood textures are used as a background and as a typography styling. To make it less overwhelming, textures are completely desaturated and paired with a bright yellow color.

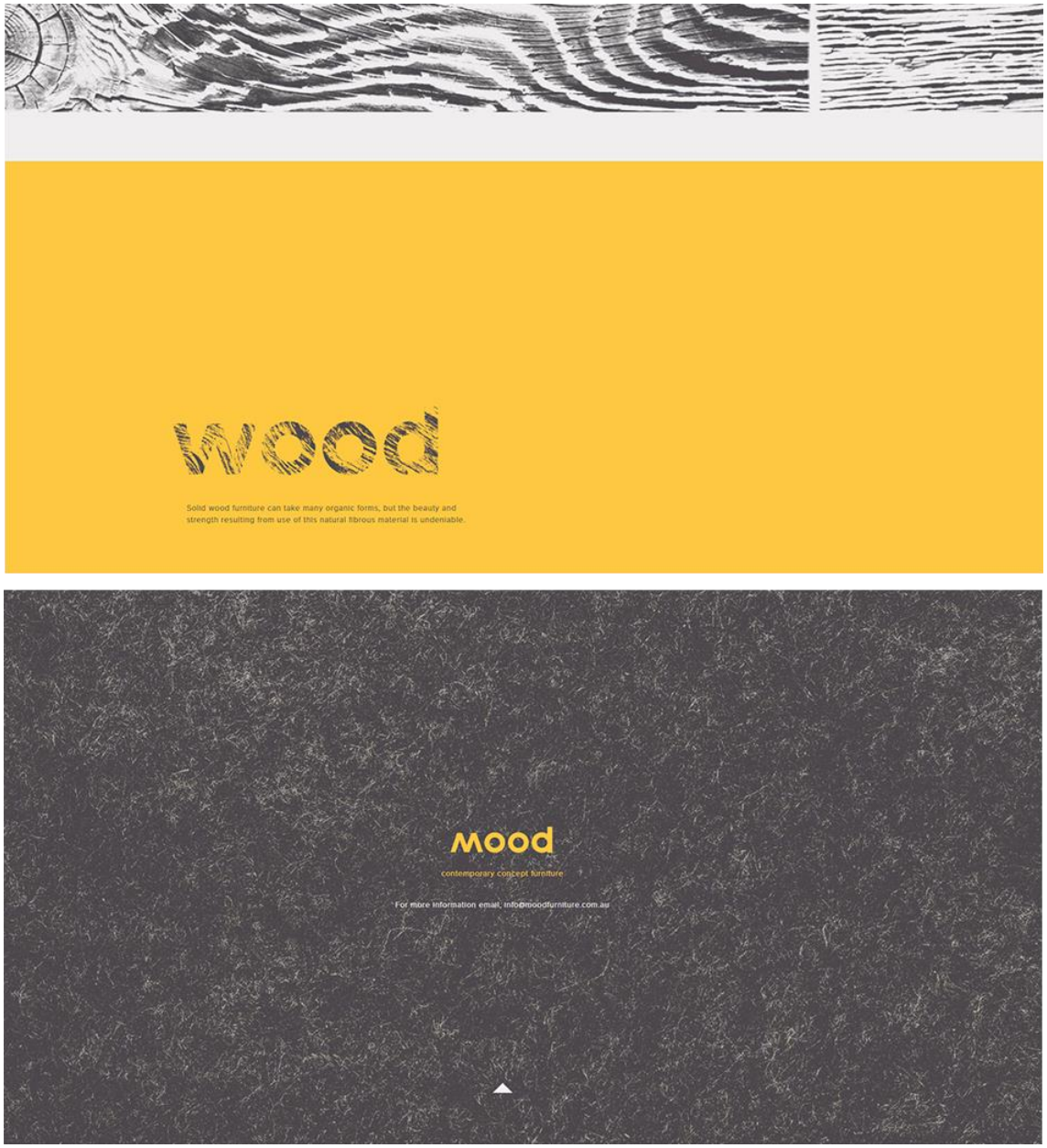


Figure 35: Mood Furniture (Source: www.moodfurniture.com.au)

The second example, shown in the Figure 36, features a gradient, which is a smart way to incorporate more colors and make it less boring without being too tacky. It creates texture and depth and could also be used to guide user's attention.

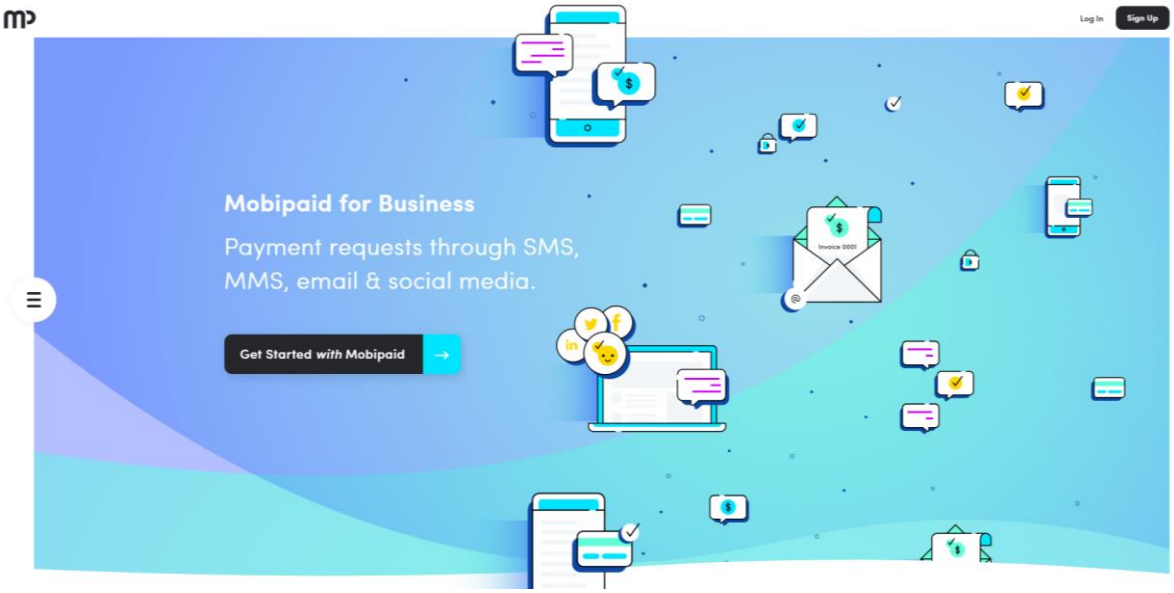


Figure 36: Mobipaid (Source: mobipaid.com)

3.9. Information hierarchy

Hierarchy is a visual technique of structuring information that help users navigate through an interface. Different levels of hierarchy use different levels of emphasis. Information on the highest level of hierarchy stands out more. Same goes for more important information, which should stand out in some way to catch the user's attention. (Cooper, Reimann, Cronin, & Noessel, 2014)

There are multiple tools for creating a successful information hierarchy. Size is one of the most obvious and eye-catching ones. Information on the higher levels of hierarchy are bigger. They can also stand out from the rest in color. Vibrant, bold color tend to draw attention on themselves. Position on the screen is also important, as users expect to find the main navigation at the top right of the screen. Texture and different styles are also found on higher levels of hierarchy. There are a lot more, such as proximity, density and whitespace.

Clearly defined hierarchy is one of the important design aspects of interfaces, especially web design, where there is a lot more information involved. Many people tend to only scan the website, so finding relevant information quickly is extremely important. (Cooper, Reimann, Cronin, & Noessel, 2014) (Jones, 2011)

3.9.1.Examples

A website in the Figure 37 showcases basic tools for establishing information hierarchy. The hierarchy on this website is pretty self-explanatory. On the first page everything is aligned to the left. The most important information is also the biggest, short and positioned in top right corner. It's evident that this is the information that designer wanted users to see first. Levels of hierarchy are differentiated by thickness and size of the text. On the second page, interesting numerical data about the company is written in big, yellow letters that draw attention to themselves. The website uses bulleted lists two times with headlines above it to show what it's about.

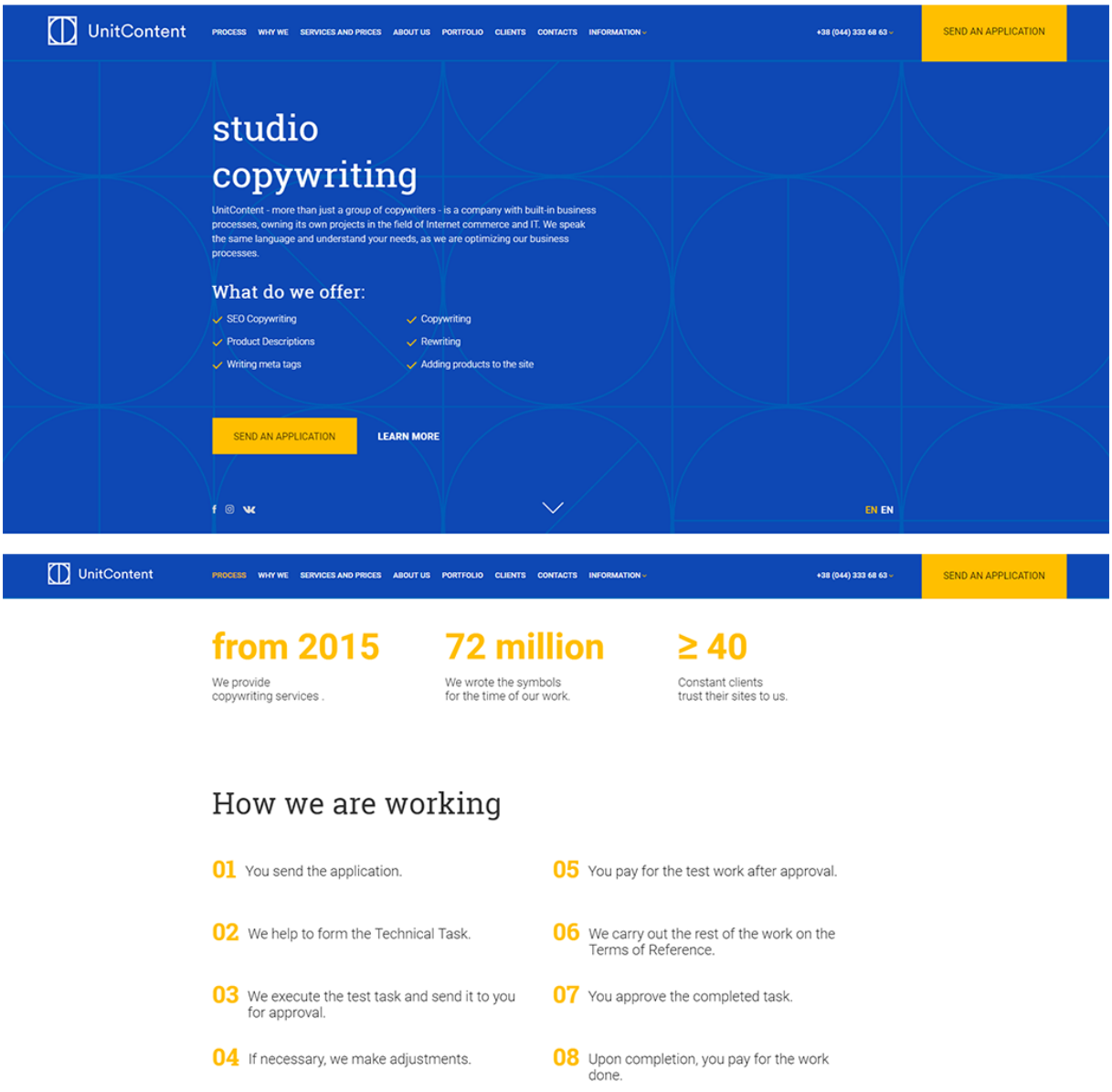


Figure 37: Unit Content (Source: unitcontent.com)

3.10. Motion

Sometimes, motion is needed to interact with users in certain parts of an interface. More than half of interfaces include some sort of motion, whether it's a moving response to action, opening the window or scrolling down the page.

3.10.1. Guidelines

Motion can be considered as a body language of an interface. They shouldn't be overwhelming, but subtle and short, to not take away attention from the content. It should not be used exclusively for decoration purposed and everywhere, but only where it's appropriate and to make an interface more accessible. They are better on smaller scale, which means not having animated effect involving the entire screen but some elements like drop-down navigation or a motion of underlining important information to draw attention to it. If you do plan on using motion for decoration, subtle motion inside of a minimalistic environment is advisable.

A good use of motion is using it as a response to commands, meaning that motion should inform the user that their action is being processed. This can be as simple as change in color, transparency or something else.

Designers should also consult with developers to see if motions they imagined are possible. Some can be possible to program, and they be accepted by users at first but loading time might make them not suitable.

Try not to be pursued into implementing them just because they are cool. Same as with information, just because you could implement it, doesn't mean you should. The process of implementing motion is best accompanied by lot of user testing. If they don't do well in user testing, maybe they should be revisited and modified, toned down a bit or removed. Initial reactions also might change after constant use, so repeated testing is advised. (Coleman, 2018)

In the example shown in Figure 38, motion is used to create an imitation of photo slideshow by swapping the pictures in the frames. The word “naked”, that appears in the name of the website, imitates neon lights and switches from turned off to turned on and then back again.



Figure 38: naked Hub (Source: www.behance.net/bezantee)

4. Accessibility

United Nations had stated in their “Convention on the Rights of Persons with Disabilities” that States Parties shall take appropriate measures to:

> *“Promote access for persons with disabilities to new information and communications technologies and systems, including the Internet.”* (United Nations, n.d.)

The right to access Internet has been recognized as a basic human right and has to be treated as such. People with disabilities should have the same access to the Internet as others do, meaning that any kind of obstacle to this should be removed. (United Nations, n.d.)

Accessibility is tremendously essential not just for reaching a wider range of audience and for giving people with disabilities access to information that they are entitled to but also for competitive advantage. There are still, unfortunately, many interfaces that are not designed for people with disabilities and having yours accessible to them will give you an advantage. (Coleman, 2018)

The focus of this chapter will be on accessibility of interfaces for people with disabilities like poor vision and hearing. There are, of course, many others that won’t be discussed but shouldn’t be ignored.

4.1. Vision

A lot of people do have poor vision to some extent, whether it’s complete blindness, wear glasses or can’t see colors properly. As a designer, there are many steps you can take to ensure that your interface is suitable for people with vision difficulties and with today’s technology, these adjustments become even easier.

4.1.1. Blindness

Many people still wonder how blind people use the technology. Nowadays that is not something extremely difficult. There is Braille display technology available, assistive screen reader technology and many other options on all commercial operating systems.

4.1.1.1. How to approach it as a designer?

In case of vision difficulties, the most important thing designers can do is to make the elements big enough, especially important ones. Using percentage or ems (a scalable unit for fonts) is much better than using fixed size for text. That way people can enlarge the text if they

have trouble seeing it. Same as with people who have trouble seeing colors, people with poor vision will see things more clearly if there are contrasting colors involved.

In case of complete blindness, there are multiple things that can be done. Blind often rely on Text-to-Speech technology to obtain information. Designers can make sure blind people can use assistive screen reader on their interface by having alternative text on all of elements on the interface and using simple and understandable text.

They will also most likely be using a Braille keyboard to interact with an interface, so it should be possible to use it like that. Examples for keyboard uses on desktop interfaces are having Enter key be an equivalent for select and confirm options and Tab key for moving focus. (The European Blind Union, n.d.)

As mentioned, many technologies have built in voiceovers and other options for people with poor vision. As an example, iOS devices have options for zooming, voiceover, increased contrast, inverted color and other display accommodations, as shown in Figure 39. Windows computers also have these options, so using desktop interfaces is also possible.

There are also many voice assistants available for the last few years, that allow interaction through speech and Speech-to-Text, without a use of keyboard or mouse.

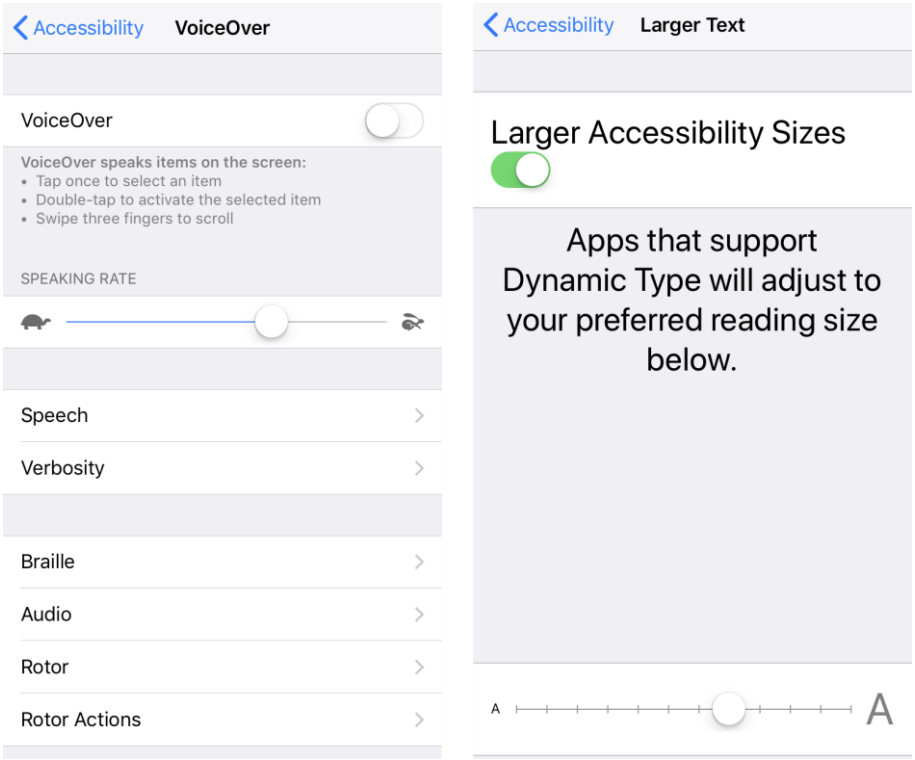


Figure 39: Options for people with poor vision on iOS

4.1.2.Color deficiency

According to statistics, men have, much higher rate of color blindness. One out of every 12 men is color blind, while that number is one out of 200 for women. There are a few common types of colors blindness:

- Protanomaly
- Protanopia
- Deuteranomaly
- Deuteranopia
- Tritanomaly
- Tritanopia

Protanomaly, deuteranomaly and tritanomaly are anomalous trichromacy conditions, meaning that they use three cone types to see color but one of them is not working properly. People with protanomaly have difficulty with red light, deuteranomaly with green light and tritanomaly, which is extremely rare, with blue light. People with these conditions can see colors in question to some extent, but their ability to distinguish them is decreased.

Protanopia, deuteranopia and tritanopia are conditions of dichromatic vision, meaning that one of their cones is not working.

We refer to light spectrums of each of these cones are red, green and blue. People who have difficulty with red or green color usually have difficulty with both colors, as their sections often overlap. The only difference really is that people with protanopia have brightness deficiency and people with deuteranopia don’t, meaning that people with protanopia see red as a much darker color. Red/green colorblind people see color in shades of yellow and blue and also have difficulty with differentiating pale shades and purples from blue.

Figure 40, made in Photoshop using an option to view images how colorblind people would see them, showcases these conditions the best.



Figure 40: Rainbow flag seen with normal vision, deuteranopia and protanopia

In extreme cases people can have monochromacy, where they see all colors in shades of grey, white and black. (Colour Blind Awareness, n.d.) (Coleman, 2018) (Clark, 2002)

4.1.2.1. How to approach it as a designer

Because of different levels of severity and types of color blindness, designing for color blindness can sometimes be difficult. Adding some type of vision more or colorblind settings is important, but there is no need to add all of the options. (Coleman, 2018)

Nowadays, most commercial operating systems on computers, tablets and mobile phones have built-in display accommodations for most often color blindness conditions, so designers can just rely on that. Some settings for iOS are shown in Figure 41, and for Windows in Figure 42.

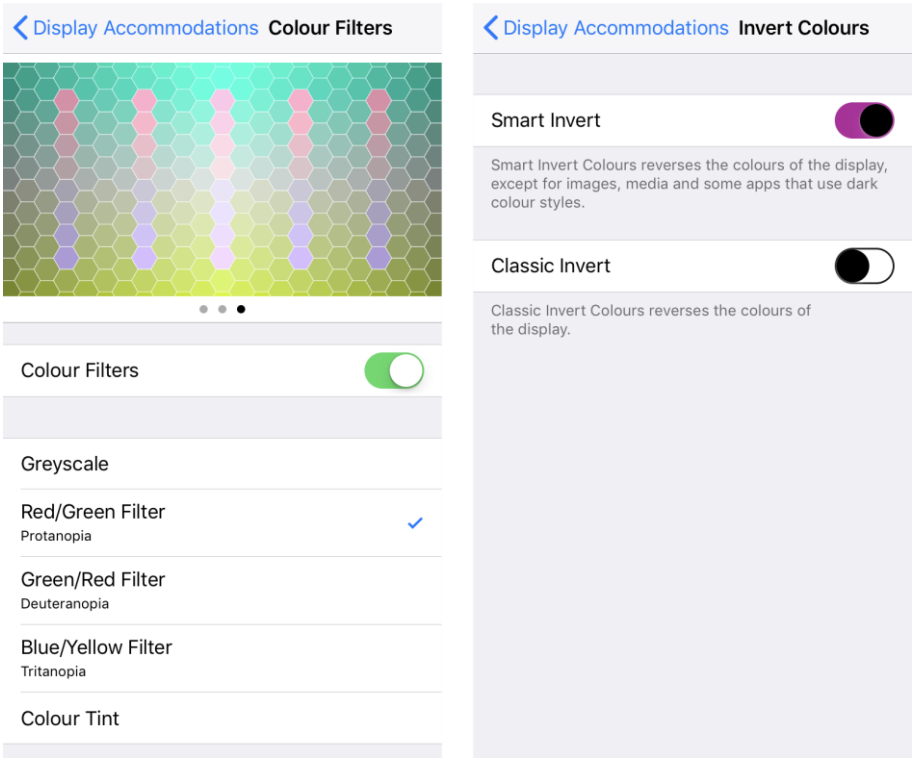


Figure 41: Color blind options for iOS

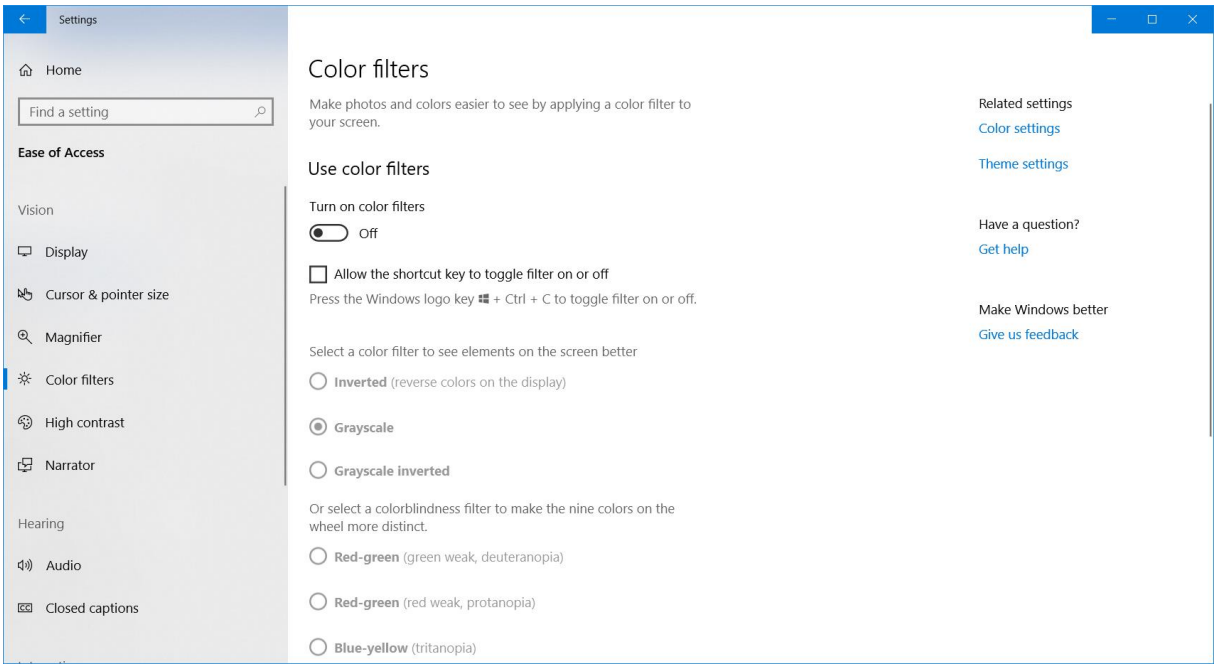


Figure 42: Color blind options in Windows 10

However, designers should still try to make their interfaces as accessible as possible through their color picking. It's not possible to create an interface that will be good for everyone, but prioritizing content is a good way to start. That means that making important parts of your interface, like links and buttons, stand out in high contrast is essential.

Important parts of interfaces shouldn't rely just on color. Links should be underlined, not just colored. Lines on graphs should either be accompanied by titles or differentiated in some other way along with color, such as using full lines and dotted lines. Sections of pie charts should have titles on them and not rely strictly on legends with colors to explain them. Try avoiding using colors that can appear similar for different levels of hierarchy, as it might confuse users. Using metadata or alternative text is also a good idea but it shouldn't be the only option. (Liu, 2010)

Colors that are most suitable for color blindness are mostly colors on opposite sides of spectrum, with high contrast. Besides the obvious white and black, safe color combinations are red and blue, orange and blue, orange and purple, yellow and purple. (Clark, 2002)

Using green or reds with dark colors is not the best idea, given how they can be mixed up with dark grey and black, especially red color which seems really dark to people with protanopia. Mixing green and red is also a mistake, as it's not only incredibly unpleasant but can also difficult to differentiate even to people with regular vision, let alone people with color blindness. As most color blind people mix yellow, orange and brown with red and green, designers should try not using these color combinations next to each other. (Liu, 2010)

Making interfaces for people with color blindness can be hard but it doesn't have to be There are multiple tools for designers to check how their interface ranks in color blindness accessibility. Most of these colors can be used but the important thing is to be careful not to use them in close proximity to each other and to always have other options that don't rely on colors.

4.2. Other disabilities and difficulties

4.2.1. Hearing

Most interfaces are purely visual so people with hearing difficulties can use them easily. However, a lot of interfaces have both visual and audio aspects to them, which means people with hearing difficulties cannot experience them fully.

These people need transcripts and audio for audio and video content or sign language interpretations of them. People that can hear but have trouble with it will benefit from audio and video content that can be paused and replayed and has volume adjustment.

Text complexity also comes in question here. For people who lost their hearing very young or were born without it, spoken language is not their first language – it's Sign Language. It's important to use simple words, short sentences and pictures and graphics. Using jargons will most likely lead to deaf people not understanding the content. (Parfitt, 2016) (Zahra, 2017)

4.2.2.Motor skills

Some people have trouble with their motor skills and cannot use a mouse or a keyboard properly or at all.

For those that can use a keyboard, all functionalities of an interface should be available by keyboard. For those that have trouble with both there are Speech-to-Text technologies that allow users to interact with interfaces and dictate text. Most operating systems today have developed systems for allowing that, so best designers can do is properly prepare their interfaces for using those with metadata and simple text. (Zahra, 2017)

4.2.3.Dyslexia

People with dyslexia have trouble reading and often with writing and spelling too. It's not a disability but a difficulty. (NHS, n.d.)

They require more time to read the content, so having an option to pause motion on interfaces or video content is helpful to them. Text used should be understandable, not complex or too long. Text-to-Speech and Speech-to-Text options mentioned for blind people and also helpful for them if their writing and spelling difficulties are severe. (Zahra, 2017)

4.2.4.Photosensitive reactions

For some people, like people with epilepsy, flashy content is dangerous as the can cause seizures. However, it's something designers can easily avoid using entirely or in ways that are safe. If they do still decide to use it, it shouldn't active automatically and there should be a warning for seizures. (Zahra, 2017)

5. Design Principles

5.1. Visual design principles

Design is a very broad area full of chances for creativity. However, there are some visual interface design principles that have been derived over decades of experience, studies and feedback. Those principles help guide designers towards their goal – creating a visually pleasing, easy to use interface that provides all of its users with information they need.

Following principles have been gathered from several books, which will be listed. Some were merged into one because of their similarities. All of them have also been discussed in previous chapters. Some of them are only applicable on desktop interfaces, some only for touchscreens. If not stated differently, they are generally considered for all or most interfaces. Since we're only focusing on visual aspects of design, other principles, like technical ones, will not be mentioned.

5.1.1. Scanning

More often than not, users tend to only scan the page instead of reading it through. Scanning is incredibly important. If an interface is designed in a way that users cannot find what they are looking for quickly, they will most likely lose interest and not bother reading, no matter how well other design elements are executed.

Hierarchy and layout are extremely important for scanning. Highlighting important content and putting them higher in hierarchy is a necessity. In a well-designed interface, most important elements will draw user's attention first. Smart use of spacing, imagery, typography, information structure and positioning is equally important.

On larger screens, users tend to use Gutenberg Diagram method, shown in the Figure 43, expecting to find focal points in the top left or top center. When scanning a page, users attention tends to focus on the top left corner first, before moving diagonally down to the bottom right corner, then going up again to the top right and finishing of in bottom left if they don't find what they are looking for before. That means that top left corner is the highest exposed and bottom left the lowest exposed to user's attention. Some also might start at the top left corner, then a bit down and finish off in the bottom right.

On contrast, user's scan path on smaller screens is not from left to right but straight down, because of screen's width, or lack thereof.

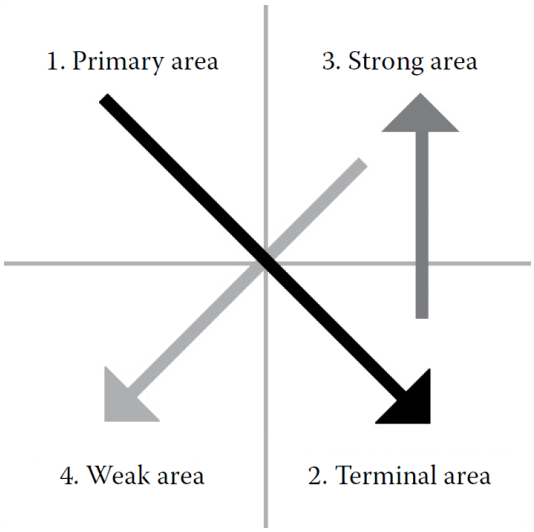


Figure 43: Gutenberg diagram (Source: Coleman, 2018)

Along with a scan path, user's direct their attention towards elements that stand out because of their color, size, uniqueness or something else. On the other hand, users avoid elements that are too complex, too large and dense with no hierarchy or highlighting provided. They also tend to avoid elements that look like ads, such as banners.

If there's a task needing to be executed, elements that complete the task are best placed in the bottom right. Navigation is expected to be found in the top right or sometimes top center and top left corner. When working with interfaces that require creating a profile, those options are usually places in the top right corner. Things like some less important links, copyright and information about the brand is usually found in the footer. (Coleman, 2018) (McKay, 2013)

5.1.2.Creating hierarchy and establishing relationships

As mentioned many times before, hierarchy is extremely important. It makes an interface both scannable and readable. It allows users to quickly find information they need and to differentiate important things from those that are less important. This is also made possible by establishing relationships between elements to show which of them are related and which have no or little connection.

Levels of hierarchy are distinguished by the use of color, size, position, spacing, style and some other things. More important things are usually larger, more contrasted against the background, sometimes less or more indent than others, or could have some unique style such as decorative font. The higher the level of hierarchy, the less information there should be, since

highlighting a lot of information defeats the purpose. Same thing goes for using all different properties – one or two is enough. Less important things tend to be less saturated, smaller or placed in a consistent alignment. A general rule is that elements on the higher levels of hierarchy are positioned above other levels. While that is usually followed, there are some exceptions. However, following this principle is more important on smaller screen. Since screens are smaller, all levels of hierarchy sometimes might not be seen all at once so it's the best to go with user's assumption that higher hierarchy is positioned at the top.

Related elements should also be grouped together and separated from the rest. There should be a sense of consistency in proximity of related items or another property that groups them, such as use of shapes as frames, so users get used to it and can easily recognize groups.

Such example can be seen on Figure 44. The most important headline is darker than the others and has the highest contrast to the background. It's also the biggest and is situated in the center. Two headlines on the lower level of hierarchy are smaller, brighter, meaning that they are less contrasted to the background and are aligned left, not center. The text on the lowest level of hierarchy is a normal paragraph of text that has more content than the others, is smaller, colored black as most of the paragraphs are, has a different typeface than headlines above it and is aligned left together with the middle headline. All these elements make one related group with sub-groups in between that are separated enough that the users can see they talk about two different services, but close enough to know that they do have a similar purpose, and that is to inform a user about what services this brand has to offer. (Cooper, Reimann, Cronin, & Noessel, 2014) (Cao, 2015)

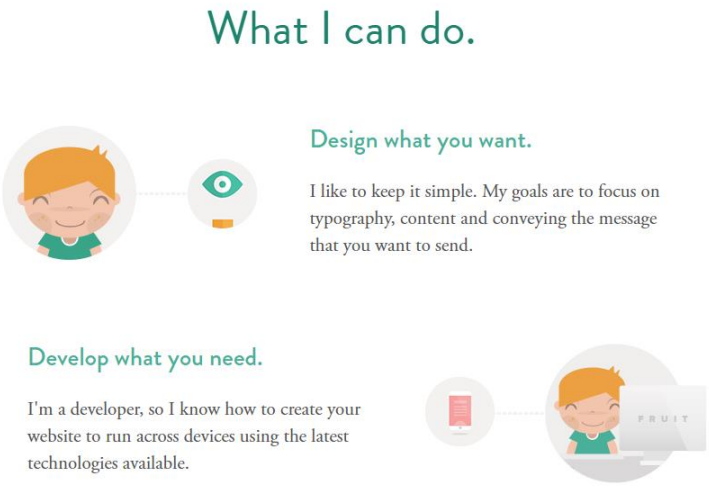


Figure 44: Sean Haplin (Source: seanhalpin.io)

5.1.3. Drawing attention

To add onto hierarchy, designers should be able to bring attention to things that they want to be seen or on those elements that you want users to interact with. Sometimes that is simple, other times it is not. To make something stand out you have to make it different while still making it fit into the rest of design.

Distinctive attributes can be size, color, motion, shape etc. Bigger is more visible, but designers should be careful with that. As mentioned in hierarchy, putting too much emphasis on one element might draw all attention from other elements that are also important and make emphasized element seem out of place and too distracting. To avoid that, it is advisable to be careful with attributes you are using to make the elements stand out. It's best to use only 2 or 3 of them and remain close to the whole theme of the design. (Cooper, Reimann, Cronin, & Noessel, 2014)

Website on Figure 45 shows an interesting way to draw attention to the main menu. The menu itself is not very noticeable but the illustrations that surround it are. Both sides of the illustrations use same colors and bottom left and bottom right corner have the same illustrations of telephone lines. Illustrations surround the menu while still leaving enough space in between and since both sides are somewhat symmetrical, our attention also falls to the center of the page where the menu is.

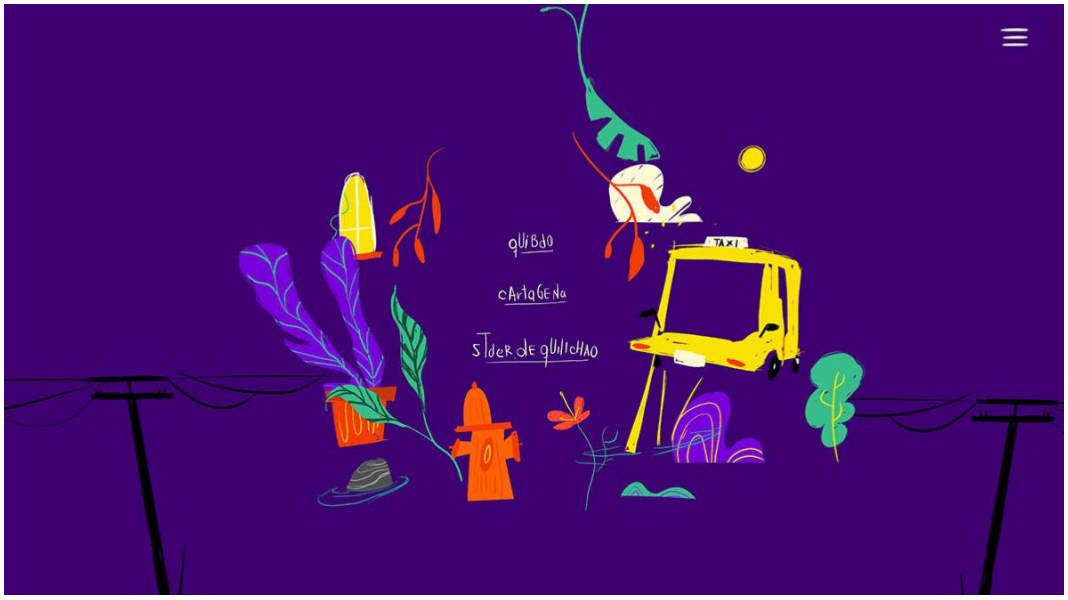


Figure 45: Storytelling for Peace Building (Source: www.behance.net/feliperodriguez2)

5.1.4. Defining visual structure and flow

Visual structure should be as defined as possible to help users navigate through a designed flow that they require. This means having a clear hierarchy, grouping similar objects by using spacing and shared visual attributes, having a consistent layout and interaction design, among others.

Users will look at elements that grab the most attention, they will scan and read the content how they're used to. Designers can help guide them. Alignment and positioning create order and priority in user's workflow. To ensure the correct way of reading information, text should usually be aligned on the left. Generally speaking, only elements on different levels on hierarchy don't have to be aligned with each other. To avoid confusion in workflow, elements like buttons and controls, such as check boxes, text fields, should especially all be aligned with their type. Designers should also make sure to follow logical paths. Think about how people scan and read websites depending on the screen size.

Designers will often opt for using a grid system. It's a faster and easier, overall more efficient way of achieving consistent and organized design. A basic definition of a grid is a set vertical and horizontal lines that divide the screen. Those lines don't exist in the finished design but serve as a foundation and a guide for the layout. It's made out of columns, that are horizontally divided into modules and represent the space where elements should be situated, and the space in between that should later on be the whitespace. Using a grid system also immensely helps with designing across devices, especially to those who haven't designed for a certain screen size in the past. When designing the same interface for the same brand across multiple devices, the grid creates a consistent feel across all of them. (Cooper, Reimann, Cronin, & Noessel, 2014) (Babich, 2017)

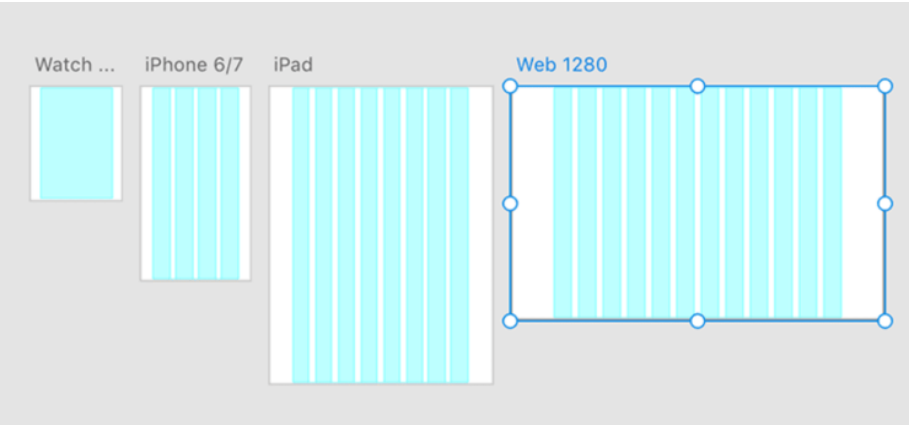


Figure 46: Grid system in Adobe XD (Source: www.smashingmagazine.com)

5.1.5.Clear functionality

Be clear on what functionalities your interface is offering. Use icons, button and symbols. Pair them up in group or put them with the content relevant to them. Related functions should be grouped together and share same visual traits. Icons should be simple, not too colorful or too big. Just because they can be detailed doesn't mean that they have to. Instead, simplify icons down to symbols that everybody recognizes.

When working with complex features, a textual description of a feature should be required. In some cases, designers should also consider pre-visualizing results of an action if that is possible. Many image-processing and image-manipulation programs have long been using this approach. In Photoshop, users are able to see how their image will look like after certain effect, as shown in Figure 47. In Chrome users are able to see how a webpage will look like converted and saved as a PDF. Some things are better showed visually than with words. (Cooper, Reimann, Cronin, & Noessel, 2014)



Figure 47: Pre-visualizing results in Photoshop

The nature of desktop, mobile and tablet web pages does not simply allow implementation of this kind of technique. However, many mobile and tablet applications use it, similarly to desktop software.

5.1.6.Respond to commands

Respond to commands means that users are supposed to be able to tell that their command was received. Sometimes the response in instantaneous and users can see the results of their action.

But, when it's takes longer, it's important to come up with a way to notify the user when the command has been received and completed. That cue should be simple and small, usually some sort of a looped design.

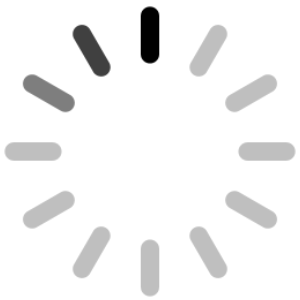


Figure 48: Loading cue (Source: www.myiconfinder.com)

Web pages on desktop, tablet and mobile devices usually don't need to worry about these kinds of things - internet browser's interface takes care of that and the wait is usually not longer than a couple of seconds. However, it's still good to somehow indicate that the action has been noted and motions are a good way to do so.

However, for software, especially more complicated ones, this is not something to be ignored. (Cooper, Reimann, Cronin, & Noessel, 2014)

5.1.7.Representing the brand

Interfaces are not only meant to be visually pleasing and informative, but also fitting to the image of a brand. If a brand is relatively unknown, it's even more important to pay attention to this because decisions you make will help make or break the brand and will perhaps stick with it for a long time.

One of the best ways to do so is with colors. Color red is associated with Coca Cola, yellow with McDonalds. All successful brands have consistent color schemes or a single color they are associated with. It's a good idea to use those colors in a design of their websites or apps. Coca Cola does this on their website, shown in the Figure 49. They used natural color like grey, white and black for most of their background and typography, and red for highlighting important parts of the website, buttons and footer.

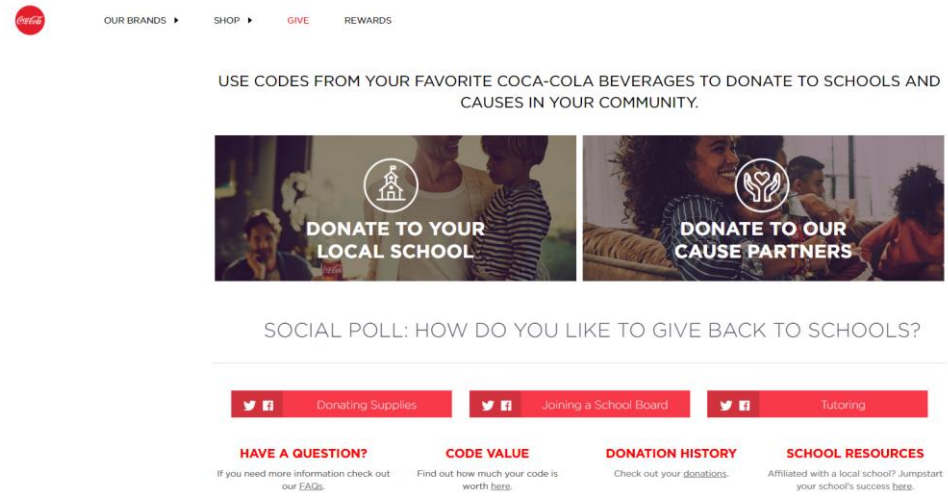


Figure 49: Coca Cola (Source: us.coca-cola.com)

Color is not the only thing that defines a brand. Adding a personality to it can help users get a sense of what the brand is about and what they stand for. Whether your brand is fun and approachable or professional and reliable, visual interface design can show that. Sierra Tequila company used a recognizable red color on their website, shown in the Figure 50, in addition to some cool shapes, pictures, decorative fonts and amusing messages to create a fun, Mexican vibe.



Figure 50: Sierra Tequila (Source: www.sierratequila.com)

Brand's personality is also be represented with words. People judge by the way you talk to them. The language used on the interface should reflect the brand. Interfaces made by fun and relaxed brands meant for younger people can use informal tone, while serious insurance companies are better off using formal tone that will make them seem trustworthy.7

Every element reflects brands personality, from color and images to shapes, fonts and text. People are quick to judge, but if used correctly, this kind of personalization will help the brand stand out. (Cooper, Reimann, Cronin, & Noessel, 2014) (WDD, 2009)

5.1.8. Striving for consistency

Consistency is a conformity of principles, interactions, appearances throughout the entire interface. Why you should make your design is consistent is simple – by using patterns of design, interfaces become easier to use and intuitive. Interactions become predictable and easier to spot. Users get use to elements of design being the certain way.

This applies to everything – color, proportions, icons, structure of information, typography etc. Illustrations and imagery should have the same style. Same levels of hierarchy should have the same style or at least most of the same properties. Icons should be consistent. That does not mean, however, that icons should be used everywhere just because they are used on some places. Just that all icons should match in visual style, and that it's not a good idea to have some of your icons realistic and colored and some illustrated and hollow with black outlines. Branding should also be consistent, meaning that an interface and the brand should not have opposite colors, personality and visual style. Positioning, margins, proximity, content, the more elements of design are consistent, the more will an interface be user-friendly, (McKay, 2013)



Figure 51: Consistency in icon style (Source: www.flaticon.com)

5.1.9. Simplicity

Users come to interfaces for information, not for design. While design is extremely important, it shouldn't make the content fall into shadow. Good design is both visually pleasing and efficient.

It's best to keep things simple. Too much color, pattern and texture is distracting and not easy on eyes - using a smaller color palette with neutral color to balance everything out is better. Same goes for typography – using one or two fonts is more than enough. You can change them up by making them bolder, bigger or changing up their color. There's also no need for using every single way possible to draw attention to elements – contrast accent colors or changing up the font and the size will be enough. Too much variation is messy and not user-friendly – there should be a consistent pattern in layout, colors, font, hierarchy etc. Cluttering interfaces with elements that don't add anything useful just ruins their functionality.

If a design conveys a message, has a clear structure and hierarchy, is visually pleasing and servers the purpose while still being simple as possible – it's a good design. (Cooper, Reimann, Cronin, & Noessel, 2014) (Coleman, 2018) (Krishna, 2015)

5.1.10. Universal usability

Interfaces should be suitable for use by a variety of users. Chances are they are going to have many different users with different age, technology experience, disabilities, cultural background and so on. Designers should look for a way to design an interface suitable for both ends of spectrum, while keeping the simplicity.

If possible, it's good to have visual information accompanied by audio aid. Most operating systems on smartphones and tablets today come with voiceover options that can do anything from read the text or say what a specific button is used for. Putting alternative text on buttons, pictures and other elements ensures that your interface is fully supported by voiceover.

Colors used for visualizing important information, such as graphs, should have a universal meaning or at least recognizable to everyone. When choosing colors, it's very important to have various levels of color blindness in mind. Even if only a small part of your users has this kind of problem, aesthetic does not need to suffer to favor colorblind users.

It's good to have all functionalities available by keyboard for people who cannot use a mouse. Information should be presented in a simple way for anybody to understand. Things like explanations or simple design for technology novices and shortcuts for experts should all

be at disposal. Layout and interactions should be simple and easy to follow. Users should be able to zoom in without losing information.

Thinking about these things whilst designing will definitely help a part of users to experience your interface fully and more easily. More in-depth explanations on how to solve these problems are discussed in chapter 4 “Accessibility”. (Shneiderman, et al., 2018) (Zahra, 2017)

5.2. Visual information design principles

Visual information design principles focus on information displayed on interfaces. Information if what users are here for, not design of an interface.

Some information is hard to show on the screen. It might be because of the complexity of information or technical restrictions or some other problem. However, screen also had its advantages. On paper, information is static, not able to change. On screen however, information is interactive and dynamic, able to reveal more information, show motion capture and many other things.

Despite differences, information on all media have common principles for good display and the main purpose in information design is always the clarity of communication.

5.2.1. Showing consequences

As mentioned in visual design principles, there’s a possibility to show consequences of actions to users before they chose to perform them, usually visually. Not only will users understand what they’re doing but could also save maintainers some trouble with complaints and maybe some more serious stuff, depending on an interface. (Cooper, Reimann, Cronin, & Noessel, 2014)

5.2.2. Visual comparison

Human memory and brain rely heavily on visual information. When showing information changing over time or in relation to some other information, visual aids are a way to go. Stock markets use graphs showing change in stock value over time, Photoshop uses graphical previews of adding effects on images and maps use different colors to show differences in elevation. (Cooper, Reimann, Cronin, & Noessel, 2014)

5.2.3. Showing multiple variables

When making comparisons between data it's best to show them together rather than separately to make comparison easier and correlations clearer. An advantage of information on screen is that they can easily be hidden and shown again, allowing users to customize the visual representation of data. This is especially important in interfaces for banking, investing, gambling, tracking advertisements and similar. (Cooper, Reimann, Cronin, & Noessel, 2014)

5.2.4. Integrating multiple types of information in one display

Good thing about information formats is that they all have their advantages and disadvantages, but they complement each other really well when used together. Information that cannot be showed with pictures are able to be shown with text and the other way around. To maximize their complementary, they are best showed together on one display. An example for this are diagrams that show text, graphics and data at once, removing the need for separate inconvenient legends. (Cooper, Reimann, Cronin, & Noessel, 2014)

5.2.5. Showing quantifiable data

To tie into integrating multiple types of information, no matter how practical visual information usually is, not everything has to be shown that way. Quantifiable data or numerical data should sometimes also be display in numbers. The best way to show information is to integrate both. This mix of data showing is not unusual. Pie charts usually use both visual display – a pie, and a numerical display – numbers. Battery percentages and loading progresses are often shown both visually and numerically too. (Cooper, Reimann, Cronin, & Noessel, 2014)

5.2.6. Excessive information

Not all information is good information. Depending on its quality, relevancy and integrity, information should be shown or left out. Many interfaces are cluttered with poor-quality, unreliable information that is not really relevant or important. These kinds of information don't sit well with users so it's best to pick only quality information. (Cooper, Reimann, Cronin, & Noessel, 2014)

6. Practical Example of Visual Interface Design – Ledison redesign

6.1. About the project

The practical part of this thesis consists of designing a desktop interface, in particular – a website. For this purpose, I've chosen to start the process of redesigning the website of a LED lighting retailer from Zagreb - Ledison. Their webstore, shown in the Figure 52, is outdated, unfinished and the design was modified from a template.

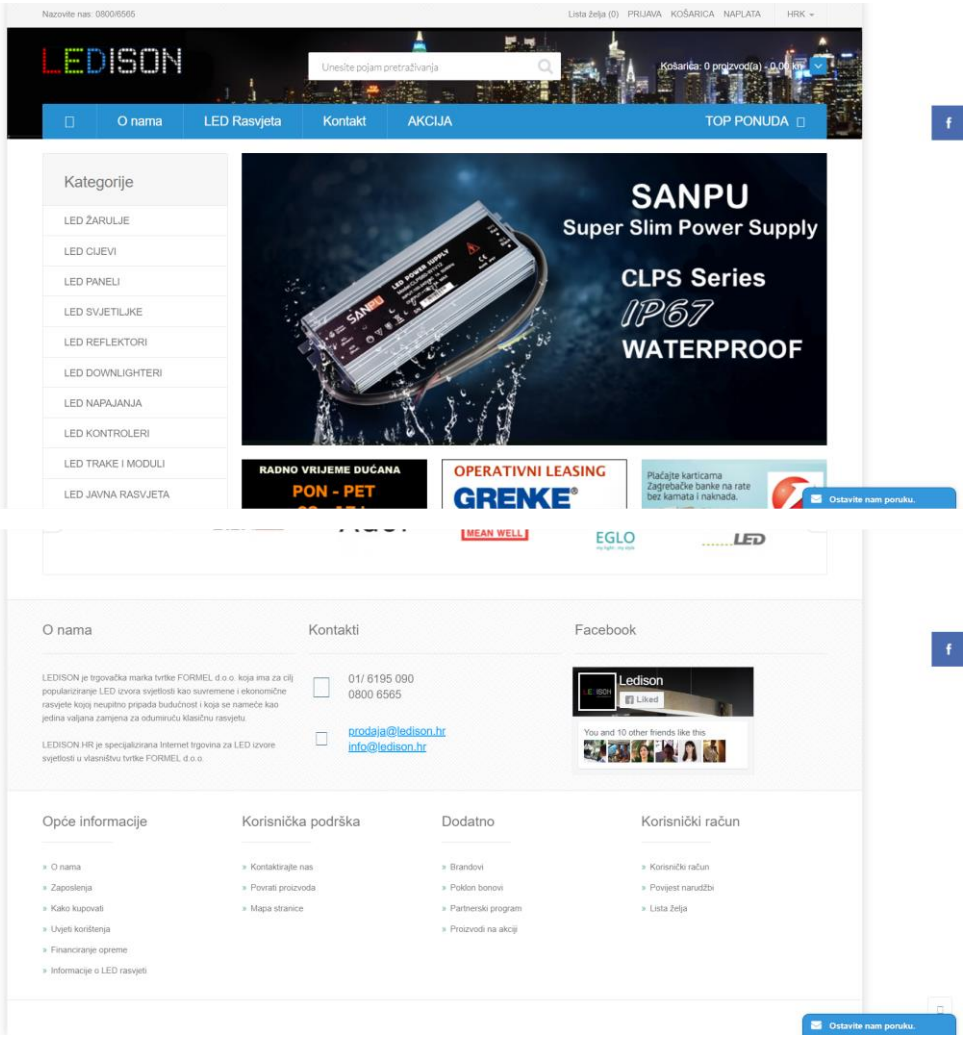


Figure 52: Current design of Ledison.hr

A redesign of this website is made for the purpose of this thesis but will also possibly serve as a reference point to the owners of this store in their future plans.

During my consultations with them, we've decided to simplify it and focus more on displaying the products that can be bought in their store. So, this website will act more as a display site, with functionalities of a webstore. Because of these reasons, and due to the fact that they've been expanding their assortment with more luxurious products, we've decided on a modern look of a website.

The finished product is only a prototype/graphic model made in Adobe Photoshop CC 2017, with addition of Adobe Color CC (color.adobe.com) for picking colors. Sketches were drawn by hand.

6.2. Sitemap

A site map of this website is not really complicated. Other than "Home", there are three main pages – "Products", "Company" and "Cart". "Product" page has its own navigation through product categories. Page "Company" is simple and doesn't have any navigations further. "Cart" page leads either to checkout or back to one of mentioned pages. There are also some smaller navigations in the footer that just lead to single pages with some information.

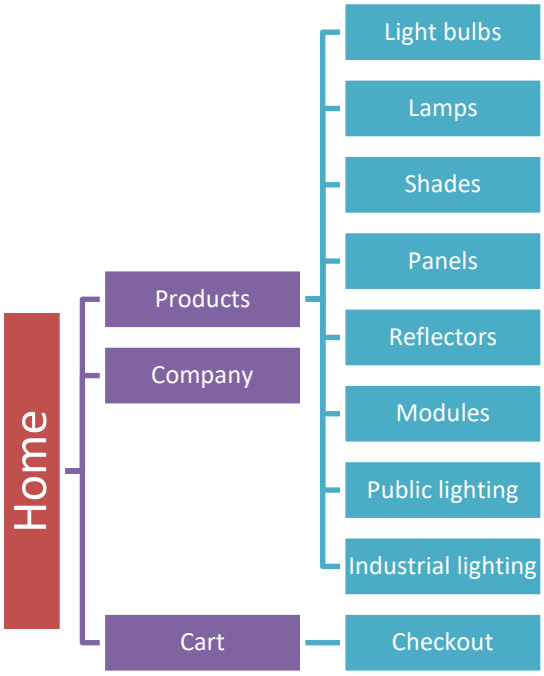


Figure 53: Sitemap

6.3. Sketches

There are only three sketches in total and the all have similar designs. A sketch that is shown third is the one I ended up using. However, there were still some changes done to it in the further process of design, most notably the place of navigation. Third design was chosen I felt like it showed the most information without being too cluttered. All three of them are shown in the Figure 54, 55 and 56.

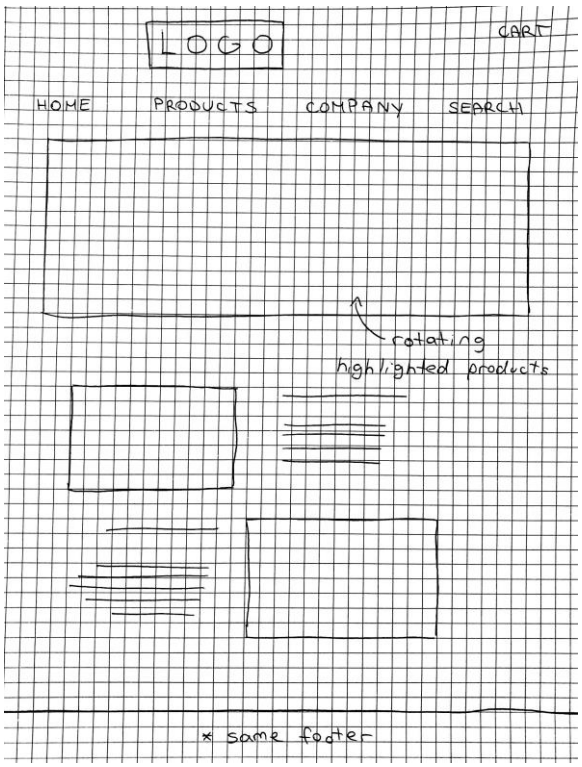


Figure 54: Sketch #1

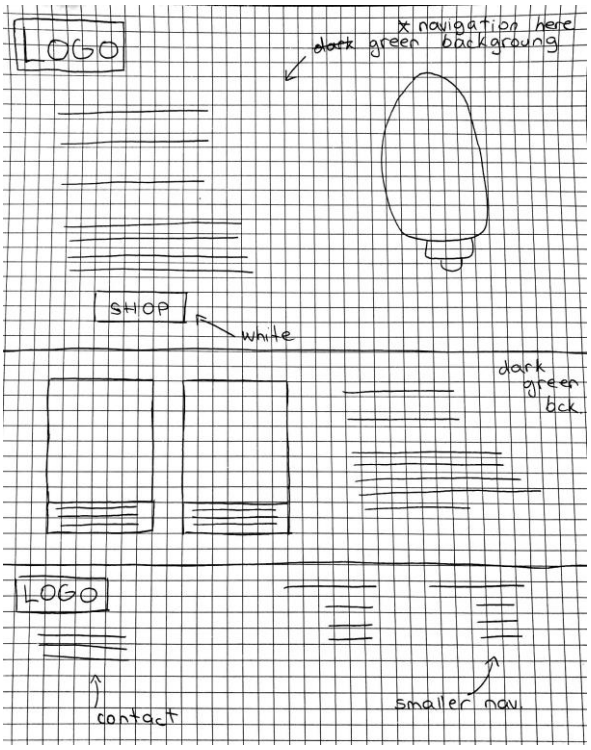


Figure 55: Sketch #2

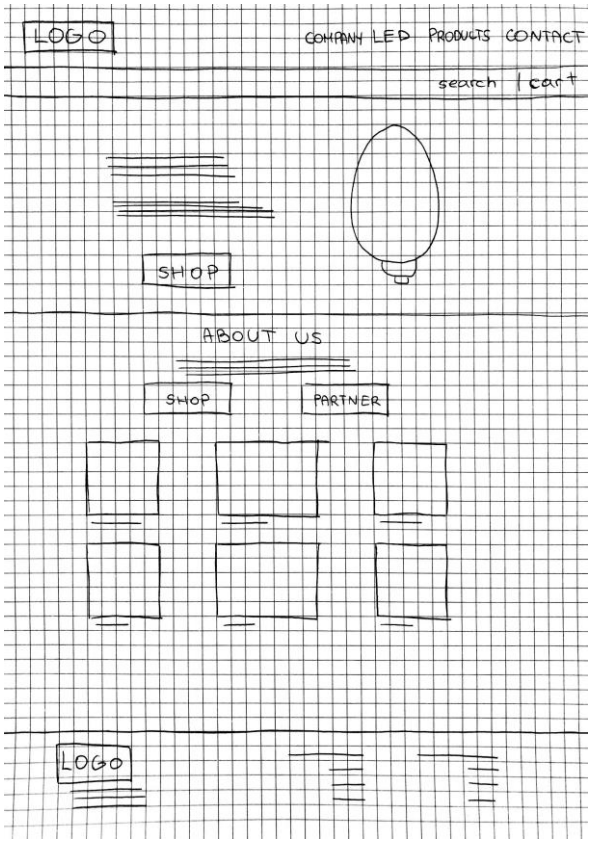


Figure 56: Sketch #3

6.4. UI Kit

Color scheme hasn't been picked out by a particular method. I've chosen two complementary colors, orange and blue, and throughout the process darkened color blue. In the end, dark blue became blacker, as I've though it suited best. Orange, in this case, represents light. It also represents energy and uniqueness.

Orange, #ff6700, is used as an emphasis color. #222627, or dark blue/black color, serves as a color for some icons and most of the text. Grey color, or #dcdcdc, is used for a small amount text, mainly for replacement text to tell users what to write in submission forms and for outline. White is used as a default color in backgrounds. Black, grey and white with the combination of orange give out professional yet modern and fun look, without being too over the top with the colors. Another point for this is that it's color safe for people with color blindness.

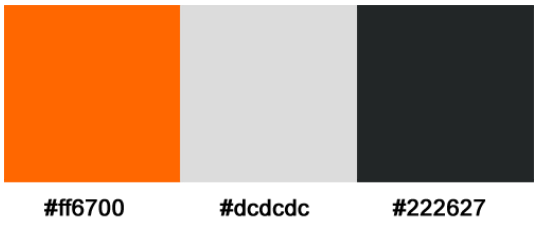


Figure 57: Color scheme

Buttons have rounded corner and are orange, which makes them stand out against white or dark background. They use bolded, uppercase letters.



Figure 58: Button

Submission forms have the same shape as buttons, but their fill color is white. Instead, they are recognized because of their grey outline.



Figure 59: Submission form

There are two sets of icons used in this interface. One is a simple black sign on a white round shape, used for social networks in the footer. Both sets have been found on IconFinder website and slightly modified.



Figure 60: Icons #1
(Source: www.iconfinder.com/iconsets/black-white-social-media)

Other icons are all just outlines of signs colored orange, and are used for search, cart and contact. This makes icons consistent but also differentiates icons for social networks from others.



Figure 61: Icons #2
(Source: www.iconfinder.com/iconsets/webshop-essentials)

Two main fonts used throughout are “Lato” and “Futura”, both sans serifs. “Lato” is used in three variations. Its thin version is used for some accents that are not meant for hierarchy but do have to be differentiated. An example for this is labeling submission forms. Its regular version is used for almost everything that is not regular text. This means that it’s used in navigation and emphasizing higher hierarchies. The only time the bolded version is used is within buttons. “Futura” is used for regular text.

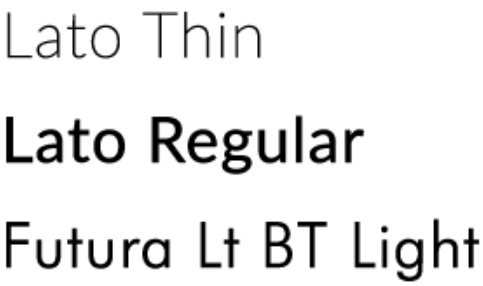


Figure 62: Typography #1

Besides two that are mentioned, there are two more fonts used in the banner on the main page – a decorative “Dandeleon vintage” and serif “Georgia”. They were used mostly to add uniqueness to the banner and to draw user’s attention to it.



Figure 63: Typography #2

6.5. Finished product

As mentioned, the finished product was made in the form of graphic models and all the pages (pictures) are attached in the digital format of this thesis.

6.5.1. “Home” page

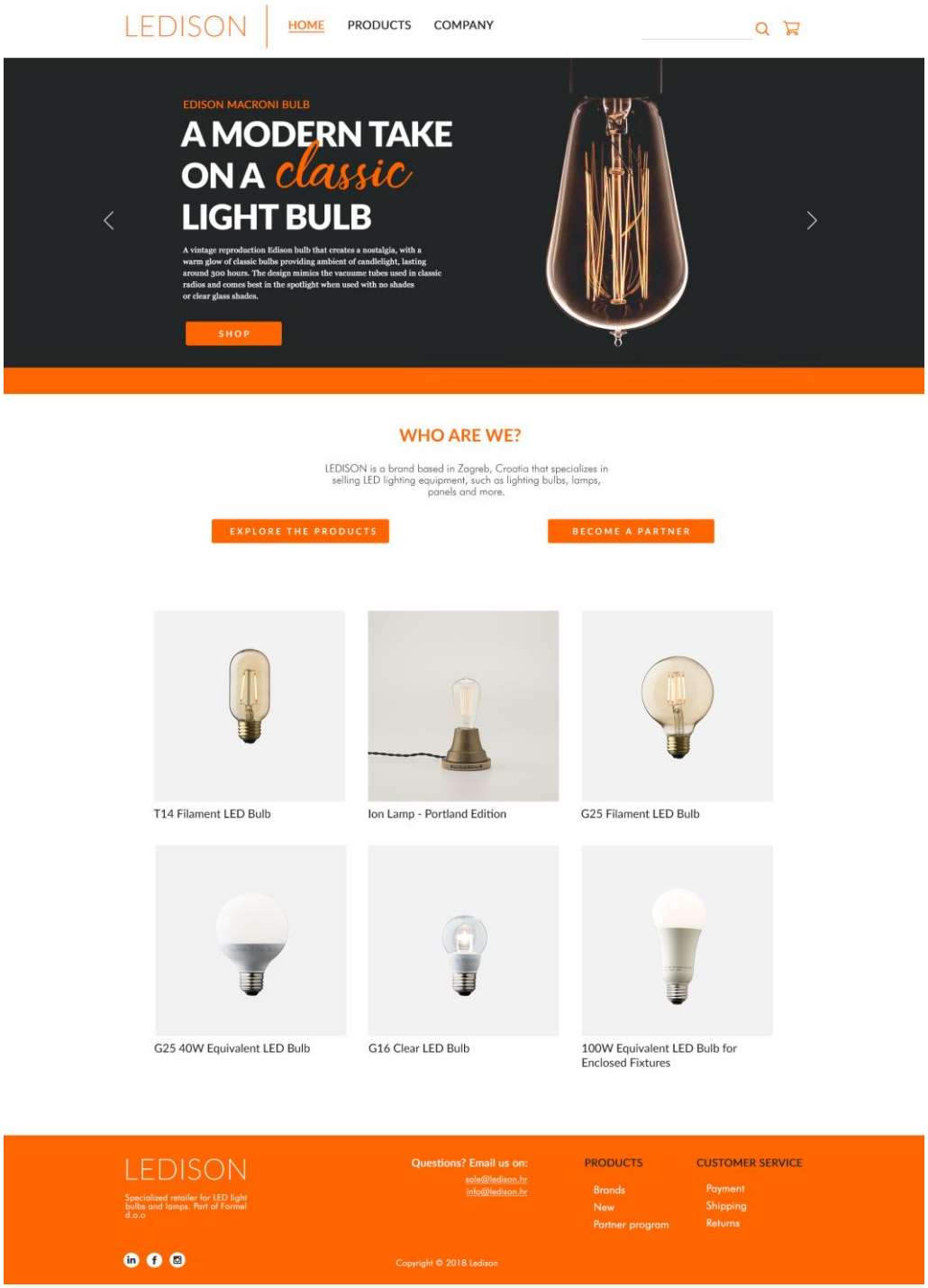


Figure 64: "Home" page

The final product of the main page, shown in Figure 64, is very similar to the sketch. It's not the same however. During designing, the main navigation was moved to the left and only search and cart icons remained on the right side.

It was important for this page to be scannable and attention grabbing because it's the first page the users see. For that, this page relies heavily on the use of colors, imagery, good structure and simplicity. Orange buttons have a great contrast against black and white background. All content is centered in the middle but there's not much text but rather lots of images, making it appear less crowded and more appealing. Images are neutral colored and don't have many details – they focus on the product. Similar elements are grouped together and create one whole.

For more detailed view, the banner on the top of the home page is shown on Figure 65 and website's footer on Figure 66.



Figure 65: Banner



Figure 66: Footer

6.5.2.“Products” page

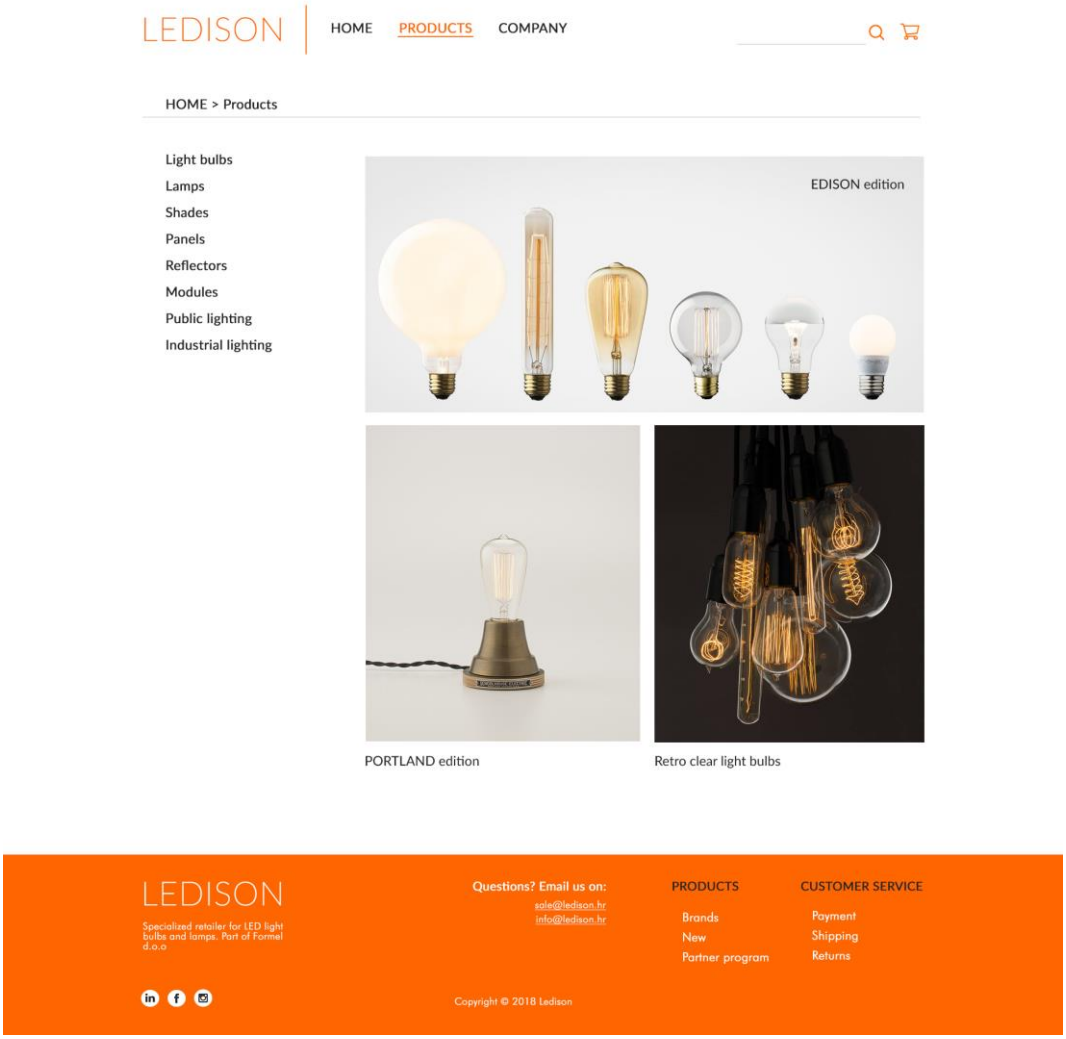


Figure 67: "Products" page

Next page is the one with products. There’s no more banner and the layout is a bit different. This first site shows featured collections and a navigation you can use to navigate categories of products. Navigation and featured collections are both in their columns. This page also wants to draw attention to the featured products in the middle, and it uses imagery and simplicity of the rest of the page to do so. There is no excessive information on this page as the images do most of the talking, and the navigation’s position makes it clear that the next step is to either pick a category of products or click on one of the featured collections.

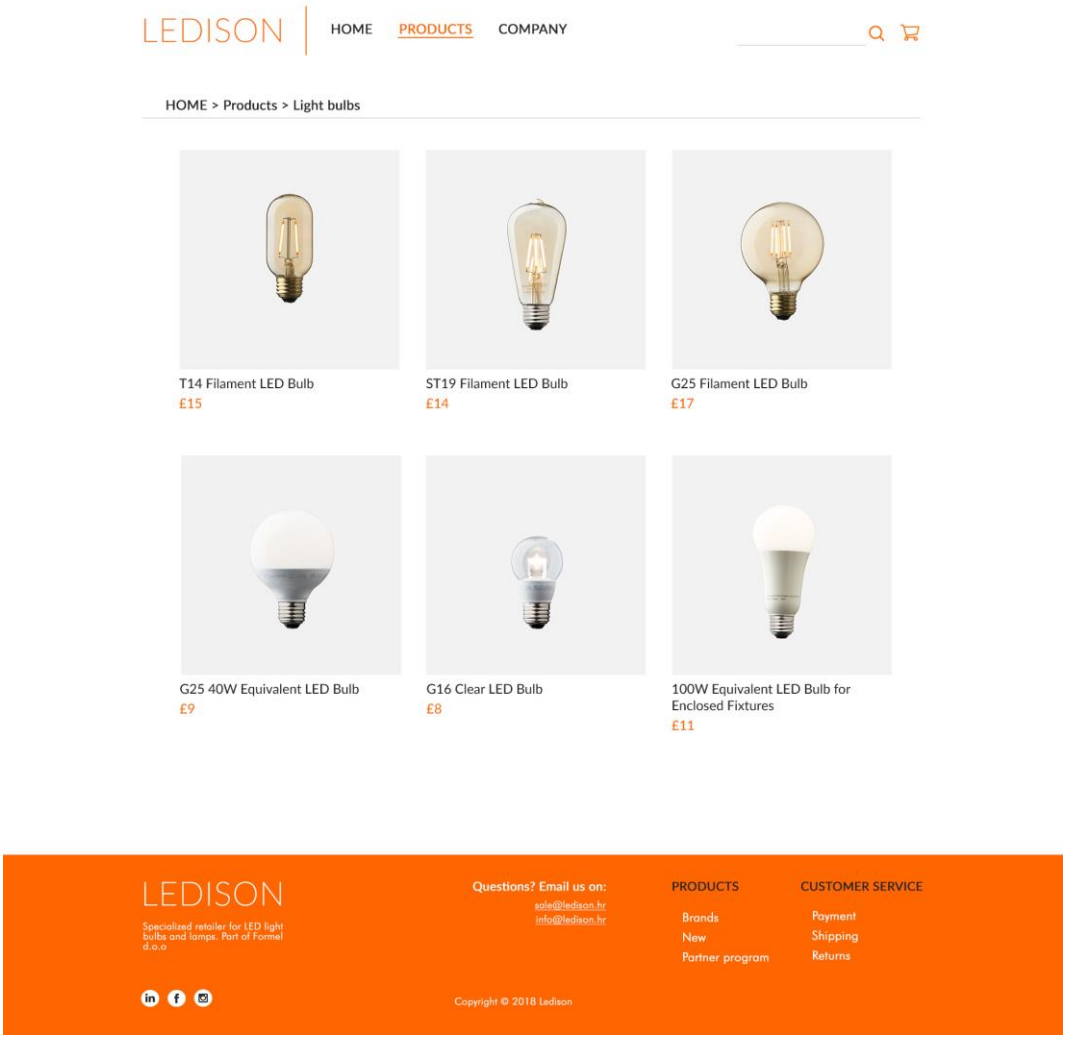


Figure 68: "Products" page

After you select a category, you will be greeted with a list of products. As is with the rest of this website, this page is simple, keeping the consistency. There are no excessive information about the products, only the image, name and price. The price of the product stands out because of its different color. Because of how vague the rest of the page is, the functionality is clear. All products are gathered together so the user can see that they are a part of one element, but every one of them is also an entity on its own. There is enough space between rows not to confuse names and prices with the wrong product.

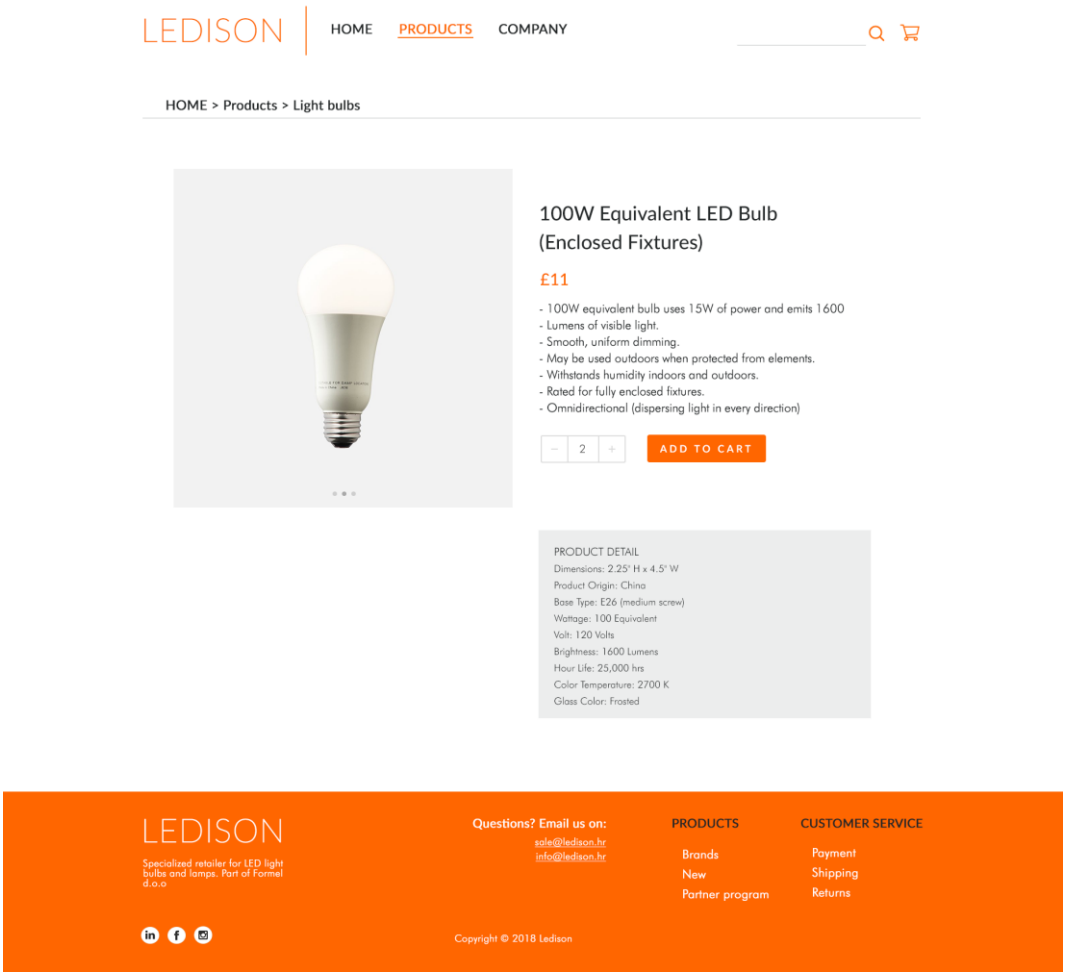


Figure 69: "Products" page

After selecting product, there will be a page dedicated solely to that product, where users can learn everything they need to know about it and add it to their cart. As the rest of the website, this page is simple and easy to scan. All pictures are in the same place and able to interchange. There is a clear hierarchy and structure – product's name, price and description are next to the picture, along with "Add to cart" button and quantity slider. Bellow is a square element with more technical information about the product. Price and the "Add to cart" button clearly draw attention, along with the picture, as it's supposed to be in webstores. The button standing out also shows the user what the next possible step would be.

6.5.3.“Company” page

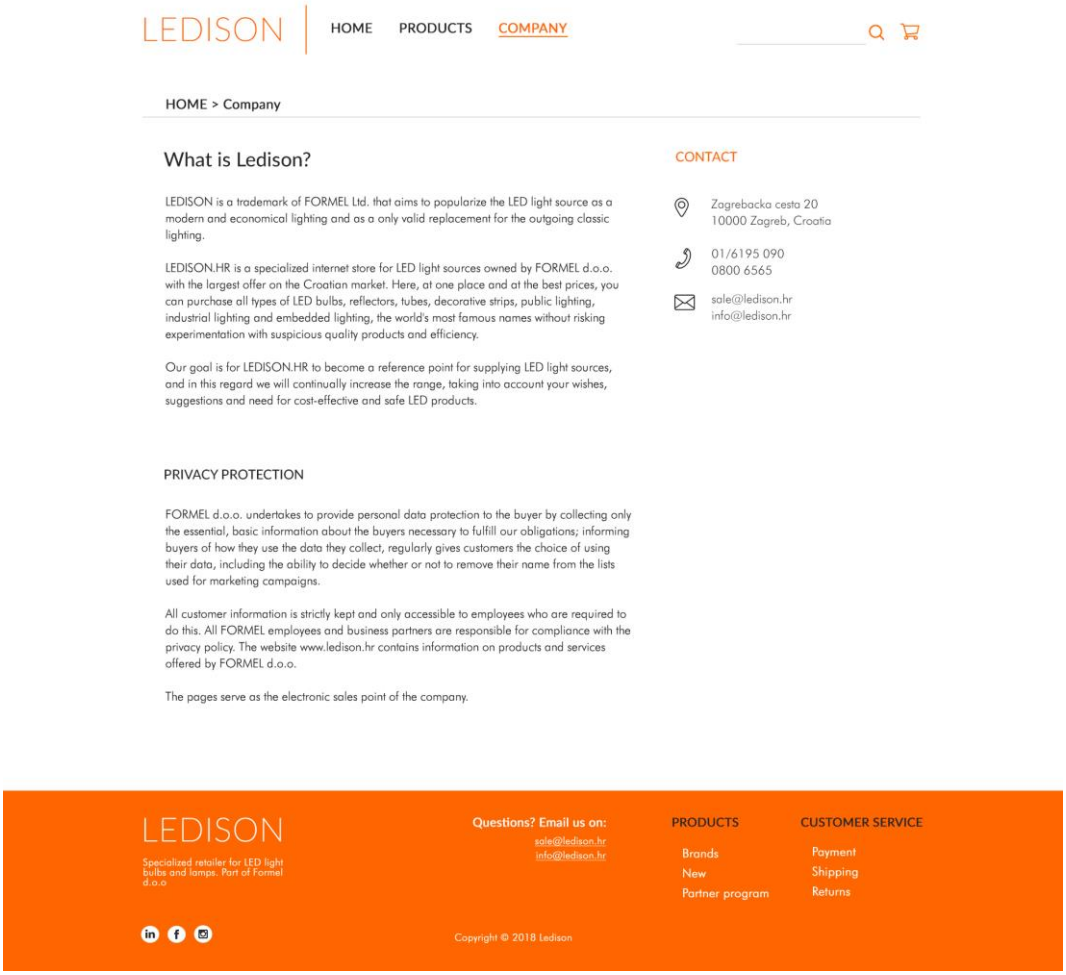


Figure 70: "Company" page

The company’s page is used purely for information about the company and contact. The text is not too bulky, as it’s broken into smaller sections, making it much easier to read. Contact information on the top right side is right where the user’s eye will go, so the position, along with the color of “Contact” label and icons, make contact information easy to find.

6.5.4. “Cart” page

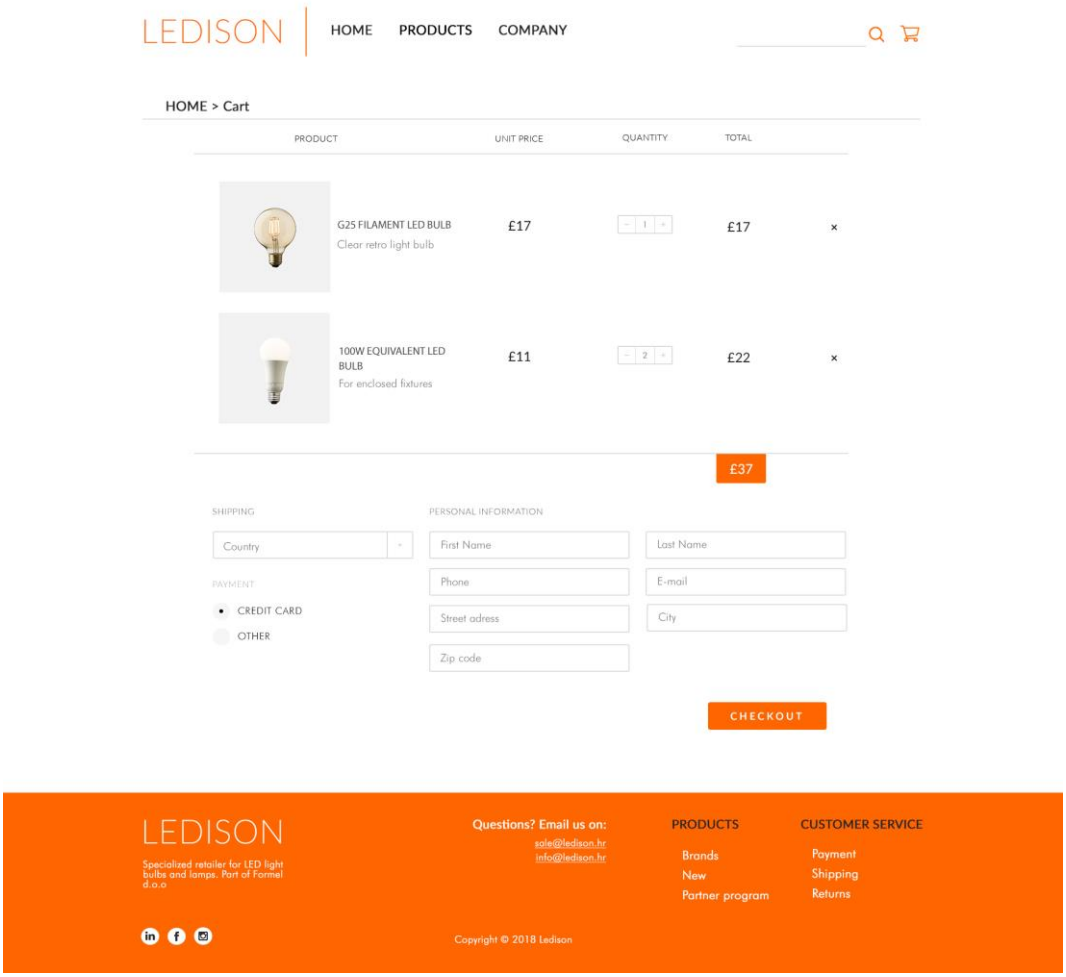


Figure 71: "Cart" page

The cart page is the most interactive out of all. Here is the list of all the things users are planning on buying. They can view all of the prices and see the total sum. If they decide to make a purchase, there is a submission at the bottom, where you need to fill out your information and then proceed to checkout. The layout of this page is clear – list of products in the cart is at the top and information about shipping and payment is bellow it. This positioning goes in pair with the intended flow of the page – payment, shipping and checkout goes last. This page relies heavily on the grid layout, both as a whole and within elements. This can be most clearly seen in the list of products, where every product has its row and every category has its column, with clear separation between. Elements that should be of most interest to the user – total price and next step, are the most attention drawing pieces on the page. This page is very simple for what it is and features no excessive information.

7. Conclusion

Developers have long neglected the importance visual design in interface design. Visual interface design is more than just choosing what looks nice. A lot of topics have been covered in this thesis but there is still so much to talk about. Visual interface design is about combining professionals from multiple fields, combining esthetics and functionality with psychology, learning how to create interfaces that are both visually appealing, user-friendly and informative.

Design is just as important as the content. Design accentuates the content, makes it more user-friendly, and in order to have a great visual design, there has to be a balance of everything. Good aesthetics can mean staying on an interface or leaving, as it's the aesthetic appeal of the design that users most rely on when making first impressions. It can also help to make users more tolerant of usability issues. Aesthetics can be a fairly subjective field and its relevance in human-machine interactions haven't been properly explained and categorized. There are some models out there, but the field is still new.

From what it started out as, visual interface design has come a long way in the last few decades. Not only has the technology changed, to allow designers to be more creative, but so did their methods of picking the right design elements and user's taste. There is still a long way to go. Some things just can't be measure and we may never find the perfect formula. Perhaps it's because there isn't one? The world is too diverse to please everybody's design preferences. There is not one perfect recipe.

And despite that, there are some design principles that are almost considered a norm in interface design. Along with choosing elements that suit your targeted audience, design principles will help make your interface the best it can be. A lot of those design principles and elements were mentioned in this thesis.

At the start of this thesis, visual interaction design was defined, and its importance was explained. It was also linked with other design fields that are important in interface design. To give the foundation for visual interaction design principles, design elements - such as color, shape, context and typography, were discussed. Each and every one of them is important, they often go hand in hand and disregarding just one of them can negate all the others. Some particular design principles were mentioned in this chapter, like what colors are best used for grabbing attention or what fonts should designers use for large paragraphs for text.

To give a new meaning to those elements, away from aesthetical and psychological view, they were mentioned in regard to accessibility. Accessibility is an extremely important

aspect of interface design that allows users with difficulties to access the information. It is often neglected in favor of aesthetics; however, designers should be able retain aesthetics while making their interface accessible to a wide range of users.

To conclude theoretical part of this thesis, some important design principles were listed, both in visual design and visual information design. Those principles combine elements discussed earlier and point to the things designers should be careful to fulfil, such as consistency of the design, universal usability, drawing attention to the right elements, defined hierarchy and relationships between elements and more. Those should serve as a guide to designers in creating a good interface for interactive products.

Some things mentioned were accompanied and explained using real life example. As a way of combining the content of this thesis and showing it in a practical use, a practical part was made. Considering that an interface in the practical part is a desktop webstore, design elements and principles were less open for experimentation. Most of them were within the “design norms” because of the nature of this interface, however, there were some alterations that stepped away from a classical webstore, such as colors and a structure, that were used to give it a modern feel.

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