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COLOR, MATERIAL AND FINISH DESIGN

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<p>Tiivistelmä</p> <p>Tämä opinnäytetyö tutkii Color, Material and Finish Design -nimistä muotoilun osa-alueetta, joka keskittyy tuotteen väreihin, materiaaleihin, pintaan ja viimeistelyyn. Opinnäytetyön tehtävänä oli koota ja jäsentää tietoa tästä vielä suhteellisen tuntemattomasta alasta ammattikirjallisuutta varten. Tavoitteena oli jakaa tietoa tästä muotoilun osa-alueesta, jotta sitä voitaisiin tulevaisuudessa hyödyntää paremmin muotoilussa ja sen opetuksessa.</p> <p>Koska alasta on vielä hyvin vähän julkaistua tietoa, tämän opinnäytetyön kirjoittamisessa on hyödynnetty kirjallisten lähteiden lisäksi myös alan ammattilaisten haastatteluita.</p> <p>Tämän opinnäytetyön lopullinen hyödyllisyys voidaan todeta vasta myöhemmin, kun informaatiota päästään soveltamaan kirjan materiaalina. Tästä huolimatta opinnäytetyötä voidaan pitää onnistuneena, sillä se ei luonut paitsi hyvän pohjan kirjalle, vaan toi myös hyvin esille alan tulevaisuudenmahdollisuudet.</p>		
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<p>Abstract</p> <p>This thesis studied Color, Material and Finish Design, which is a specialized field of design focusing on these three features of a product. The purpose of this study was to gather and analyze material for a book on this still relatively new and unknown field of design. A further goal was to spread information of the field so that it would be better recognized within the design industry and within educational institutions offering courses in design.</p> <p>Since there is a limited amount of information about color, material and finish design, the information for this thesis was gathered not only from written sources, but also from interviews of several professionals working in this field.</p> <p>The first three chapters of this thesis address the industry and profession on a general level. The following three chapters focus on trends, color and material properties and the design process from the perspective of color, material and finish design. The last chapters study the future prospects and industry development.</p> <p>The final benefits of this thesis will be explored later, when the information is applied in the writing process of the book. However, the conclusion of this thesis is that it did not only clarify the profession and create a solid frame for the book, but also discovered the growing potential and future prospects of color, material and finish design.</p>		
<p>Keywords Color, Material and Finish design, CMF, color design, trend research</p>		

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1 INTRODUCTION

We are constantly surrounded by design. We are surrounded by products that all have not only a form and shape – but also a color, material and finish. Although they are physical features, they affect us on an emotional level. Every user creates their own perception and relationship with a designed object. Whether you dislike or love a product, whether it annoys you or boosts your social status, every little detail matters. By mastering the designing of colors, materials and finishes, designers can control how other people react to our designs.

Color, Material And Finish Design (from now on referred to as CMF Design) is still a relatively unknown field of design, which is being mainly used by large or trend-orientated corporations. It supports both the functional and emotional attributes of design.

By designing beautiful products with appealing colors, materials and finishing solutions, it takes the product to a whole new level. It does not only serve the functional requirements, but also creates a better user experience and affects us emotionally. By designing not only to serve a purpose, but also to satisfy all of our five senses, we can create products that truly move people.

More beautiful and appealing products are not just more satisfying to consumers, but also reduce the risk of market failures and the amount of waste from unsold products. When the product is carefully designed to be the most appealing to a specific target group, it is less likely for it to stay on a store shelf or eventually end up on a landfill.

Without paying any attention to trends, colors or materials, the full potential of a product stays unachieved. Without appealing color schemes, the product will not reach its full market potential. The right color schemes speak louder for the desired target group and also contribute to brand recognition.

By spreading the knowledge and making businesses, designers and design schools more aware of the benefits of CMF design, it could be beneficial to even more companies – and consumers.

However, in order for companies to benefit from CMF design, they first need to find suitable designers or agencies for the job. Since there is a lack of professionals working in the field due to the missing education, companies have problems finding talented individuals.

By adding more courses and degrees on CMF design at schools and making companies more aware of the field of design, we can hopefully enjoy better-designed products and a cleaner environment in the future. The purpose of this study is to gather information for a book, which hopefully contributes to the spread of the knowledge about this specific field of design. The book will later be published by the commissioning company OMUUS Oy, which is a design agency specialized in CMF design.

This thesis studies CMF design by exploring the industry through the design processes and work tasks of CMF professionals. It also addresses trends and color and material properties from CMF design's perspective. Since this field of design is relatively new and still evolving, its future prospects and developments are studied at the end of the thesis.

Since there is a limited amount of information about the industry, the material for this thesis was collected from interviews of CMF design professionals in addition to written internet and literature sources.

This thesis is a framework and preliminary material for the later published, professional literature. The text is created to serve the ultimate purpose of the book, but also to give a glimpse of what this industry holds for those who are not yet familiar with this area of design.

2 RESEARCH METHODS AND QUESTIONS

Since the profession is still quite new, finding information about the industry is challenging. Fortunately, there is a growing number of Internet articles and interviews of CMF professionals that offer relevant information.

Prior to this year, there has not been any published literature purely about CMF design. However, a CMF design professional, Liliana Becerra, recently

published a book named “The Fundamental Principles of CMF Design” which is a comprehensive survey about the industry. Other literature sources used in this thesis focus on color theory.

The limited amount of written material was complemented by interviews. In April 2015 I visited the former Nokia chief of design Frank Nuovo in his Bel Air design studio in Los Angeles. This interview was crucial in order to form a clear picture of the early years of CMF design and its development in consumer electronics.

The other interviewees were Jaana Beidler and Sarah-Jane Leavey. Beidler is currently teaching CMF design in Aalto University and has worked in the past for example for Nike as a CMF design professional. Leavey is a Kymenlaakso University of Applied Sciences teacher and her expertise in digital color was used for CMF design in digital surfaces.

The main research question of this thesis is “What is CMF design?” and the sub-questions are “What benefits does CMF design bring to product design?” and “What are the future prospects of CMF design?”

3 WHAT IS CMF DESIGN?

CMF design is a specialized area of design that focuses on three elements of a surface – color, material and finish to support both functional and emotional attributes of a product (Feel Good Creations 2016 ; Morrison 2010 ; Becerra 2016, 12).

In order to design a successful product, the functional performance and aesthetics need to be perfectly in balance. CMF design is all about ensuring the best possible material and finishes technologies to support the functionality of a product, but also very much about emotion and senses. (Becerra 2016, 12.)

To interpret the surrounding world, we use our five senses; sight, hearing, taste, smell and touch. The information that our brain gathers via the different senses is more than 80 percent (Feel Good Creations 2016). Therefore the look and feel of a material is undeniable important, since they give us so much information. Senses have a significant effect on both psychological and

economical level, as fifty percent of our buying decisions are driven by emotion (Swisher & Shepard 2013).

Learning to design for all the five senses is becoming even more important for companies and designers. Our society is being influenced by digitalization – where according to studies – the relation to the physical world is often blurred and therefore special stimulation to senses is important in order to avoid disconnection from the world. (Aroche 2015 ; Kusume 2015.)

For a product to stand out from the shelf, it needs to be designed to attract the human eye (Becerra 2015,12). CMF design focuses on the details and on the consumers' perception of a product. It is needed in order to bring more emotional value to the design by stimulating our senses the right possible way. (Feel Good Creations 2016 ; 20Plus 2014 ; Aroche 2015.)

To do so, trend research, analysis and strategic design are needed for understanding all the external factors that affect our emotions; for example socio-cultural and aesthetic trends (Qiu Yuan 2014 ; Feel Good Creations 2016 ; Reiko Morrison 2010).

3.1 Backgrounds

In the early 1990s, CMF design was still an unknown industry both in consumer products and in fashion. Understanding the deeper influence and importance of colors and materials was often left aside and was not considered an entity of its own. (Beidler 2015.)

Despite the absence of CMF design in fashion and product design, the field of design has existed in the automotive industry since 1920s, where color, material and finishing design had been a curtail part of the design process for decades. CMF design in the automotive industry is known as color and trim design, which includes in depth trend and consumer research and their application to the vehicles. (Isoaho 2014.)

3.2 History

In fashion and product design, the colors and materials were previously often left to the end of the design process and they were more an afterthought than a driving force. Today, materials work more often as a framework for the design rather than something that is applied later in the design process. (Beidler 2015.)

The outlook on colors and materials finally started to change, when Nokia brought CMF design to the consumer product design process in the early 1990s.

Prior to CMF design at Nokia, the color, material and finishing decisions were made by marketing executives based on their own perceptions of what the consumers might find appealing. (Nuovo 2015.)

The new approach to design was established by Nokia's Chief of Design Frank Nuovo, who saw the deficiencies in the existing design methods. Nuovo introduced CMF design to Nokia by applying his previous working experience from automotive industry to the mobile phone design process. (ibid.)

While previously working for Designworks BMW, Nuovo learned the importance of CMF design in automotive design and saw the possibilities it could offer to the consumer electronics industry. (ibid.)

Nuovo created a team that was specialized in trend forecasting, colors and materials. The color and material choices were from then on based on trend and consumer research and no longer the executives' personal opinions. (ibid.)

When colors and materials were before implemented afterwards onto products, now they were taken into consideration in earlier stages of the design process. The colors and materials were now designed to serve the right market segments and tested to be technically available before production. This new approach to design was soon adopted by the competitors and can today be found within all the smartphone manufacturers. (ibid.)

4 CMF DESIGN PROFESSION

The tasks of a CMF designer vary from research and creative process to production supervising, execution and strategic planning.

A CMF designer needs to be aware of the upcoming trends and the new innovations in processes and materials. They are not only responsible for creating the ideas and schemes, but also for supervising the production and application of the techniques. (Qiu Yuan 2014 ; Nuovo 2015 ; OMUUS 2013.)

The professionals working in the field of CMF design often come from different design backgrounds (for example from industrial and product design, fashion, textiles, graphics, illustration, branding, advertising and apparel) and usually have a special relationship with colors or fashion and trends. (Nuovo 2015 ; Beidler 2015 ; Bacerra 2016, 14.)

The work tasks of a CMF designer vary within different professional areas (Bacerra 2016, 14–17).

4.1 Color design and color development

Color design focuses on creating color palettes for specific surfaces, finishes and materials. This area of design is often used for the automotive industry, consumer electronics and consumer goods.

Color development requires a chemistry background and involves mixing inks and paints to achieve the best results in terms of technical performance and functionality. Besides the technical aspect, both color design and color development require constant understanding about upcoming trends. (Bacerra 2016, 15–16.)

4.2 Material design and material development

Material design and development is often highly innovative and it can even be the core of the design and brand identity. Material design focuses on creating material solutions that meet both the technical requirements and design trends.

Material development requires high technical understanding. Material designers often have an engineer background or they work together with material engineers. (Bacerra 2016, 16.)

4.3 Surface and finish design

Surface design includes the designing of patterns, graphics and structures of a product's surface. Finish design is all about the final look and feel of the product, and it is very much guided by the material properties and manufacturing. (Bacerra 2016, 16.)

4.4 Strategy and development

Since every product CMF design is used on will be sold commercially, it is very important for a CMF designer to understand the business side of designing a product. This requires strategic and marketing planning and their application into product and market opportunities. CMF design strategy requires knowledge of consumer insights and a skill to look three to five years to the future in order to gain a competitive edge in the market.

CMF development focuses on developing the colors, materials and finishes beforehand so that they can be ready-to-use for mass production. The process usually starts from a target sample and is then applied to materials possible in terms of production. The process is often relatively long, since every color, material and finish has to meet not only the aesthetics and design trends, but also technical requirements. (Bacerra 2016, 17 ; OMUUS 2014.)

4.5 Trend forecasting

In order to design relevant and desirable products for the consumers, trend forecasting is a crucial part of the CMF design process. Since it takes time for every product to get to the market, it is important to look to the future while designing the product. By understanding the future consumer behaviors and trends and applying them successfully onto the product, the design will better meet the desires and aspirations of the target consumer. (Bacerra 2016, 17 ; OMUUS 2014.)

4.6 Storytelling and marketing

Since fifty percent of our purchasing decisions are based on irrational, emotional values (Swisher & Shepard 2013), storytelling is an important part of a design process. A CMF designer needs to be able to sell the ideas to the consumers and within the organization based on real facts, figures and research information of why a certain color or material can increase sales. (Bacerra 2016, 17.)

4.7 Education

There is a great lack of education in CMF design. There are no specialized degrees in the field of design, but today a few schools offer courses and programs in color and material design and trend research. Courses including CMF studies are available for example at the College for Creative Studies (United States of America), Scuola Politecnica di Design (Italy), Iup Arts Appliqués (France), Consorzio Del Plitecnico Di Milano (Italy), ArtCenter College of Design (United States of America) and Aalto University in Finland.

As an example of a CMF studies, Politecnico di Milano has a masters programme “Colour Design & Technology” which includes studies of human perception, reproduction, chemistry and psychology of color. The programme

has a wide set of application fields including product design, interior design, fashion, communication, entertainment, and lighting.

4.8 Industry

CMF design is used widely within different industries, including consumer electronics, automotive industry and fashion. For a growing number of industries, CMF is becoming a useful tool for diversifying the product portfolio and creating a novelty value with a relatively low cost. (Bacerra 2016, 13.)

There are some major brands that have succeeded particularly well in CMF; for example Nike, Apple, MINI, Jawbone, Beats and Tesla are known for using CMF as a core of their design. (Bacerra 2016, 14.)

4.9 Professional requirements

While specific educational requirements are not necessarily needed for working as a CMF designer, there are some personal features required in order to success as a professional.

One of the most important qualities for a CMF designer is to be very creative and to be able to think outside the box. CMF designers need to be curious and they need to have a desire to learn new. A CMF designer has to have an aspiration to continuous learning and exploring since it is a constant evolution, you will never reach full knowledge. A CMF designer always has to be aware of the new technologies and be able to try them out. (Morrison 2010.)

CMF designers need strong analytical skills in order to organize information into clear, concise descriptions. Since CMF design's importance can be hard to understand for people who are new to the field of design, good presentation skills are paramount in order to gain credibility and to make other people see the potential for the business. As colors and materials can be a very personal experience, communication skills and the ability to talk in a business language are important in convincing and influencing other people. Communication is

also important in terms with collaboration – cross disciplinary team working skills are a valuable asset for CMF designers. (Beidler 2015 ; Morrison 2010 ; Yuan 2014.)

It is also curtail for a CMF designer to understand the behavior of colors and what affects their perception. They need to have a keen eye for colors and be familiar with their various properties. (Beidler 2015.)

5 COLOR

Not only is color the heart of visual creation – the very core of art, images, design and environment, but also a phenomenon deeply underlying all biological existence and an important tool of communication.

Color is neither a property of an eye, brain nor of the surrounding world – but of all them combined together creating a bridge between the observer and observed. (Arnkil & Hämäläinen 1995, 7.)

There are some universal rules about what colors different consumer groups tend to find appealing, but since the perception of a color is affected by both personal, and external and physical factors, CMF designers need to be aware of them in order to make the color schemes appealing for the consumers (Smith, 2014.)

5.1 Light

Colors are how a human eye detects radiation. Different colors are formed by different wavelengths. The visible light to human eye is only between 400-700 nanometers of the electromagnetic spectrum, as demonstrated in Figure 1. These wavelengths are the only radiation the human eye can see as colors. The visible colors from the shortest to the longest wavelength are violet, blue, green, yellow orange and red. White light color is a mixture of the other colors and black is an absolute absence of light. (What Wavelength Goes With a Color. 2011.)

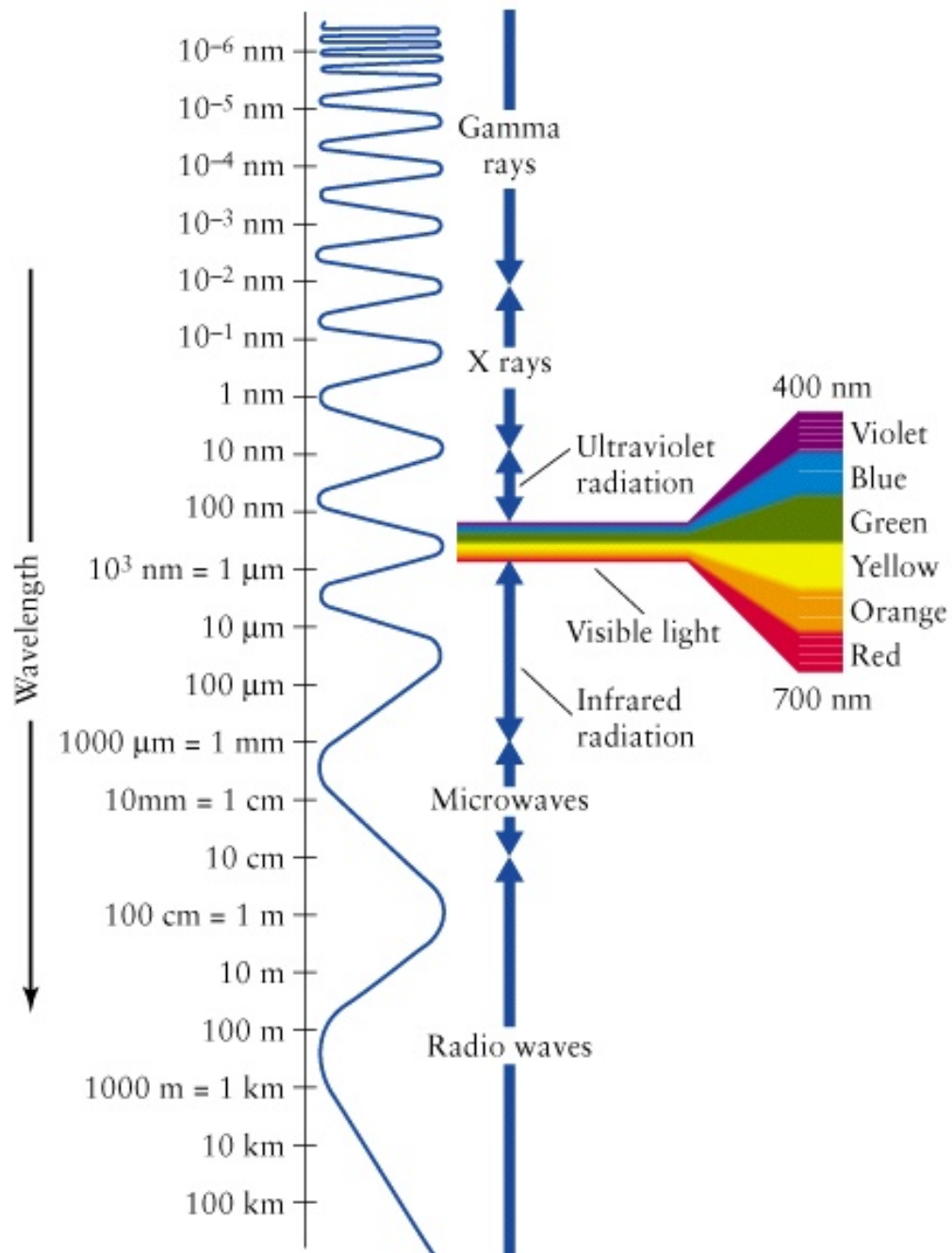


Figure 1. Visible light spectrum (University of Colorado 2007)

Products do not have any color of their own; instead, color is an effect created by light. The physical color of an object only exists when the rebounding light has been altered by the material. The material absorbs parts of the light spectrum and transforms it into heat, while the rest of the spectrum is reflected creating color. As shown in Figure 2, color reflectance is highly influenced by the wavelength. Therefore, color does not exist by itself – it always needs light

and a surface to be reflected off (Zwick 2003, 16).

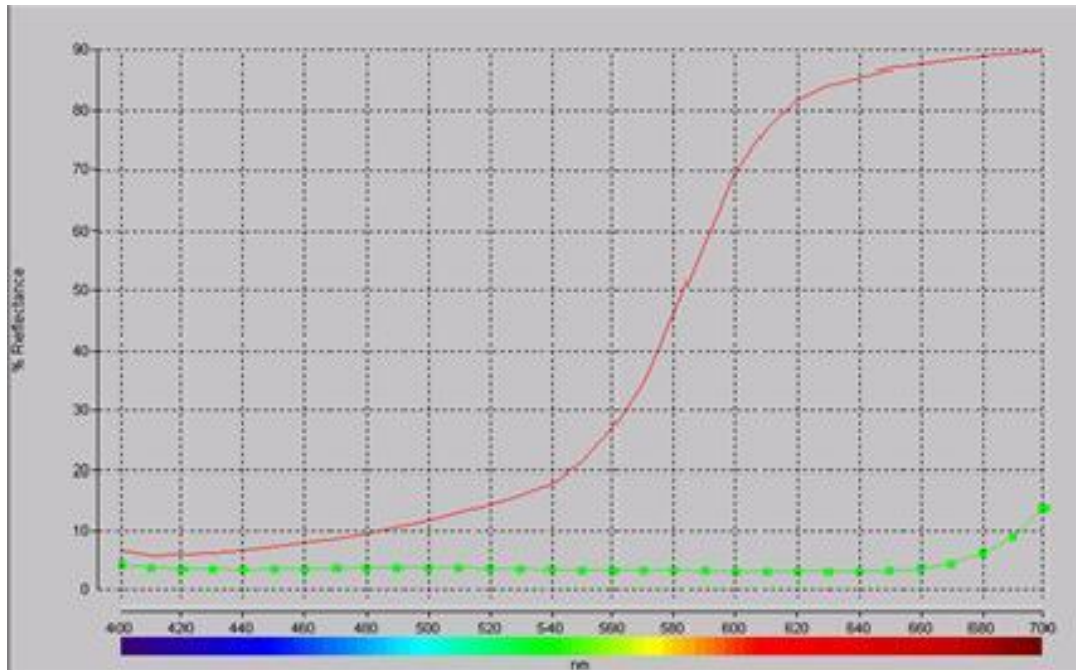


Figure 2. Color reflectance of grey (green curve) and bright orange (red curve) (Collishaw 2012)

Due to light's changing nature, there is never an absolute tint, shade or tone for an object, as demonstrated in Figure 3. The time of the day changes the light and, therefore, the color of an object. Even the weather conditions and surroundings reflect color and have an effect on the object's coloring. (Arnkil & Hämäläinen 1995,134–135 ; Eisman & Herbert 1990, 9.)



Figure 3. The same color under three different light sources (Collishaw 2012)

The phenomena of color changing due to lighting conditions is called metamerism. In design, the unwanted surprises of metamerism can be avoided by using the same lighting as in the intended surroundings (True Color: Metamerism 2016). This is also why it is so important for a CMF designer to know which region the product is designed for. Is it designed for

example to Asia Pacific or to the Nordics – they both have severely different lighting conditions, and the colors are perceived differently. As an example, have you ever bought a piece of clothing abroad in a tropical location, and back home noticed the color is too bright for you to wear? This exemplifies the differences in light frequency. For a CMF designer a standardized light box is a crucially important tool to view color in a right light environment.

5.2 Material influences

Material properties and plasticity influence the way the oncoming light is altered defining the surface color of the object.

When the light waves are absorbed into the material, they are transformed into warmth and the object appears dark. When being completely reflected off the outer surface of the object, the color appears white. Transparent and translucent colors are created when the light passes the material. (Zwick 2003, 18.)

Shiny surfaces intensify color while rough surfaces, on the other hand, will deepen the color. A matte surface is less saturated than glossy surfaces and metallic colors often reflect the surroundings. (Eisman & Herbert 1990, 23.)

Due to colors' changing nature, a color can have a different effect if a different process is used in manufacturing. As even the slightest change in the material changes the color, only an approximation in color planning within different productions is possible. (Zwick 2003, 18, 64.)

Therefore CMF designers have to know the materials and understand which colors are possible for the material. Different materials and finishes have limitations both in their natural properties and in manufacturing processes and therefore color is always driven by the material.

5.3 Size and shape

Besides the materials, the shapes and size of the product should also be taken into careful consideration in color design – the color schemes should be in harmony with the modeling features.

Generally we see higher-saturation colors larger than a similar object in a different color. We also see a color in a larger size brighter than the same color in a smaller size. Due to this phenomenon, called “the color size effect”, small-sized color samples are not reliable for choosing the right color for products.



Figure 4. Example of the perception of color weight (Knight 2011)

A similar phenomenon can also be found in the perception of weight – darker colors are perceived heavier than lighter colored ones as shown in Figure 4. (Campbell-Dollaghan 2016 ; Eisman & Herbert 1990, 24.)

5.4 Legibility and discord

Before anything else, we see color. Although we are naturally drawn to bright and saturated colors, the message must be readable. Using contrasts and

opposites is a good way of increasing visibility. Our primitive instincts are also a good trick to use when maximizing visibility – for example, black and yellow is a color combination often found in dangerous or poisonous species and therefore easily grabs our attention. (Eisman & Herbert 1990, 22–23.)

A color used in an unfamiliar way is popular for example in advertising and package design due to its eye-catching properties. In today's hectic shopping culture, the average time spent on viewing a product on a shelf is somewhere between 1/25 and 1/50 of a second. Therefore the visual appeal of the color should be maximized – an unseen product is an unsold product. (Eisman & Herbert 1990, 23.)

Legibility is an important factor especially in brand recognition. The recognisability from afar is determined by the differences between the foreground and the background in hues, brightness and pureness. (Yuan 2014.)

5.5 Color association

Even though there are general rules that apply to color, the precipitation of a color is always affected by psychological features (Yuan 2014). Colors are a way of communication and the message changes according to cultural context. Colors affect our emotions, and they influence us on a collective level. (Zwick 2003, 119.)

To be able to do good color design, it requires familiarity with color meaning and ability to use it creatively. It is very important to know the target group and to know which color schemes appeal to the desired market region in order to avoid market failures. (Yuan 2014.)

For example, color perception has been proven to change with age. Children prefer bright and saturated colors such as reds, yellows and oranges, because they associate the colors to high energy and positivity (STIR). With age, the

eye's lens becomes more yellow, leading the visual spectrum shift towards yellowish hues. Although our perceptive apparatus filters the extra yellow, it also seems to prefer more subtle colors than earlier in life. (Dotinga, 2014.)

5.6 Color combining

The contrast of opposites is also a great way of increasing visibility. Combinations of light and dark, dull and bright, and warm and cool draw the attention of the eye. If visibility is a curtail factor, fluorescent finishes can be used to maximize the impact. (Eisman & Herbert 1990, 22–23.)

In order to avoid distracting and flickering combinations, color combinations of green on orange, red on green, red on orange, yellow on orange, orange on blue and white on yellow should be chosen with consideration as shown in Figure 5. (Eisman & Herbert 1990, 23.)



Figure 5. Example of distracting color vibration (Janviere 2009)

A general rule in color combining is that one color should be the most dominant to give the color its message, ambiance and visual importance. When the second color is added to the dominant color, it should subordinate the dominant color and whenever a new color is added, it should subordinate all the other colors in the combination. The more colors in the combination, the more complex the color panning becomes. It takes a trained eye to keep the combination becoming too busy or confusing. (Eisman & Herbert 1990, 20.)

As color-meaning associations usually tend to be formed in relation to high-saturated variants, associations with more subtle colors are less distinct. The same pattern is also seen in color combinations; the more contrast used, the more likely it is to create an association and a color-meaning link. (Eisman & Herbert 1990, 25.)

Colors are rarely used in isolation, they are affected by their surroundings – larger color masses influence smaller color masses. For example, a medium grey square placed inside a larger black area appears lighter than the color of the same square inside a white area. Therefore the surroundings of the color always have to be taken into consideration in color combining. (Eisman & Herbert 1990, 24.)

Color combining also changes the nature and message of a single color. Color combining is like music – there is no exact meaning for a single color, it is defined by the combinations.

5.7 Color vision

As a CMF designer, other important factor in color planning is to take color-vision deficiency into account. The condition also known as “color blindness” can either affect the most common red/green area or the blue/yellow area or even the complete spectrum. The percentage of color vision deficiency is much more higher in men than women, affecting approximately 8 percent of men and one in 200 women. However, the problem can however be avoided in design, for example in digital applications a color-selection is an ideal solution. (Colour Blind Awareness.)

There are also tetrachromats who can see more colors than most people – up to 100 million. Tetrachromats have a fourth receptor and they can see approximately 100 times that of the average human with three receptors. The fourth receptor is found more often in women; approximately 12 percent of

women carry this gene. (Tsoulis-Reay 2015)

6 TRENDS

Tracking trends and knowing, understanding and applying them is important for business and marketing in order to create profitable new goods, services and experiences. Color is the first thing that meets the eye when the customer is shopping, so therefore colors are not only a matter of fashion and style, but also of strategy. With trend research, relevant information can be obtained about what the consumer finds desirable to be conducted into modeling, material selections, color schemes and processing techniques suitable for the target consumers. (OMUUS 2013 ; Yuan 2014 ; Tan 2011, 40–45.)



Belkin iPod Case Color Trend Research F09

BLINK-iD

Figure 6. Results of trend research (Morrison 2010)



Belkin iPod Case Color Proposals F09

BLINK-iD

Figure 7. Results of trend research (Morrison 2010)

A trend should not be confused with fashion, since trends are more about the influence of fashion than fashion itself. Trend research is predicting where fashion is going, but also needs to take into consideration the other fields, such as automotive industry, consumer electronics and sports industry as shown in Figure 6 and Figure 7. (Nuovo 2015 ; Yuan 2014)

6.1 What is a trend?

Trend is an evolving change, which can be defined by consequences and driving forces (OMUUS 2013)

Every trend is a cause or consequence of another trend. Every global megatrend has an impact on how we behave and interact with the surrounding world. The changes in our societies affect our values, aspirations and desires – and in the end what we buy.

To understand what people will buy, it is important for a designer to be able to look to the future and understand how trends shape our societies and what it means in terms of design.

For example, beige and nude colors could stem from the need for authenticity, which translates into nature, wood, skins, leather and furs. It can also come from a desire for long-term investments in fashion and design. In a recession, more natural tones are popular after years of more vivid colors. (Tan 2011, 44.) The colors and materials you find today on a product can therefore be a result of a bigger picture and society-shaping trends – for example, a recession. This example given correlates with the trend hierarchy as shown in Figure 8 and with the five trend subgroups: megatrends, socio-cultural trends, consumer trends, behavioral trends and services and products.



Figure 8. Example of trend evolution and hierarchy

The five trend subgroups; megatrends, socio-cultural trends, consumer trends, behavioral trends and services and products each have their own duration and meaning. (OMUUS 2013.)

Megatrends are social, economic, environmental, political or technological changes that typically last for ten to fifty years, such as climate change or urbanization. They are large, global, underlying forces that drive other trends. (ibid)

Socio-cultural trends are a way for individuals and societies to adapt to megatrends. Socio-cultural trends last from five to ten years and are culturally specific sociological tendencies, which affect morals and behaviors. (ibid)

Consumer trends are driven by socio-cultural trends. They are changes in consumer lifestyle and consumption behavior. Consumer trends last from two to five years. (ibid)

Behavioral trends are new practices of consumption, how consumers use services and technology. They typically last from a month to one year. (ibid)

Services and products are the solutions that enable or support consumer behavior. They are for example the designs and technologies that support the socio-cultural, consumer and behavioral trends. (ibid)

6.2 Trend evolution curve

Trends are always evolving, merging and diversifying. As they grow, they become more visible and relevant. They can be divided into four different categories: rise, debate, exposure and dissemination as shown in Figure 9. (OMUUS 2013.)

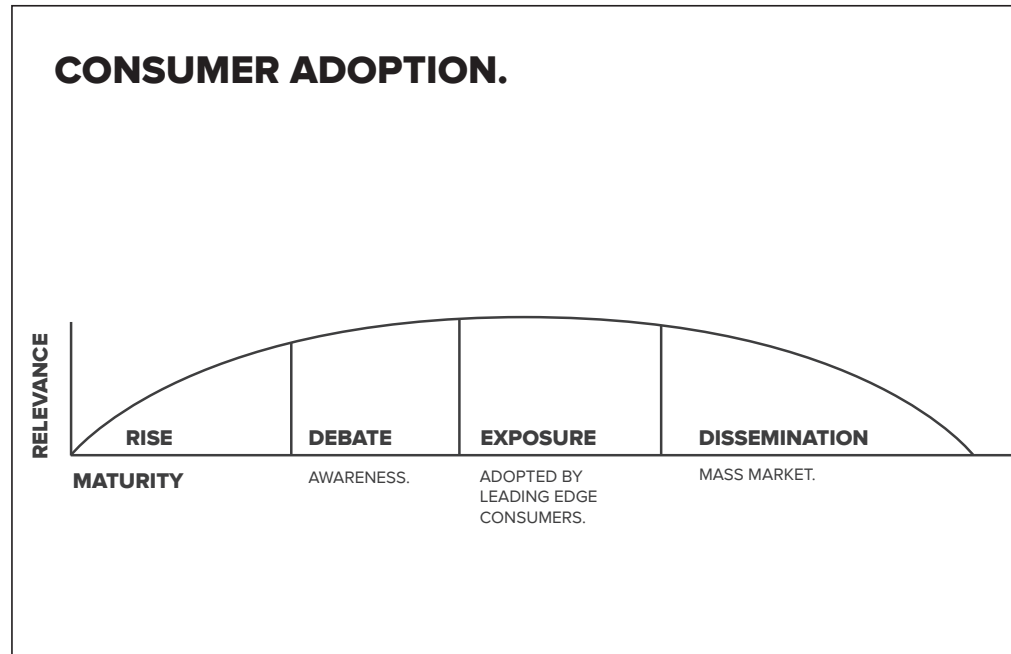


Figure 9. Consumer adaption of a trend. (OMUUS 2013)

Trends at rising point are new and still relatively unknown, for example new innovations. When awareness of the trend increases and new consumer behaviors start to emerge, the trend is called “debate”. When it is adapted by leading edge consumers and it has a high novelty level, the trend is in exposure phase. When finally turning to dissemination, the trend has a low novelty factor and is abandoned by the leading edge consumers and adopted by the mass market. (OMUUS 2013.)

7 CMF DESIGN PROCESS

While colors and materials used to be often applied onto products at the end of the design process, now colors and materials are more and more taken into consideration in the early stages of designing. Nowadays companies have started to realize the importance of CMF design, the differentiation that CMF brings to businesses. In order to create differentiation, the color and material

design needs to happen in the front end of the design development cycle. Sometimes the design can be even completely driven by colors and materials, and in these cases, CMF takes place even before the rest of the design process starts. (Reiko Morrison 2010 ; Beidler 2015.)

Industrial designers and color and material designers work today closely as a team – as soon as the industrial design starts, CMF design also begins, which allows for the proper research and development to happen. The two fields of design have become more integrated. (Morrison 2010 ; Beidler 2015.)

7.1 Strategic design and branding

Colors are always specific depending on the identity of the brand, and are also influenced by style, attitude, price range, the age of consumers and the market region (as shown in Figure 10) and therefore should always be selected for a product’s specific customers. Global markets require deeper investigation when designing a color palette.

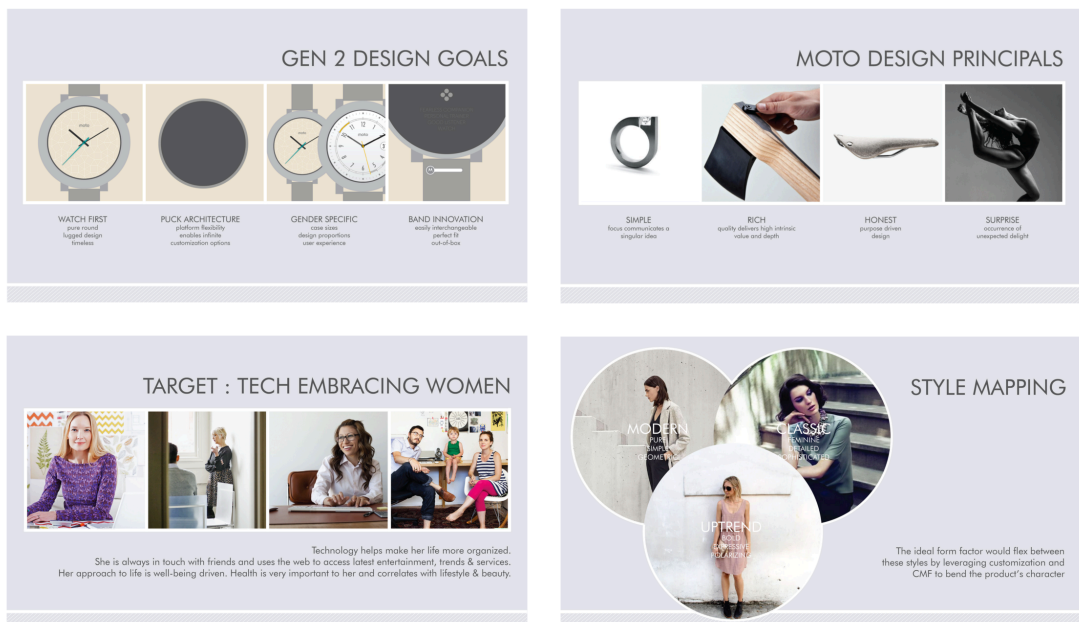


Figure 10, Moto 360 GEN 2 CMF design example (Morgenroth 2015)

Colors and materials are not just about what the consumers want, but also what the company wants to project in terms of the brand. Companies should also follow their identity in selecting colors. Therefore, color and material design should be in the core of design thinking and brand strategy. Unified, brand-specific colors and materials increase brand recognition, communicate brand personality and contribute to the on-shelf visibility. The right color can increase brand recognisability by as much as 80 percent (Morton 2012). (Nuovo 2015 ; OMUUS 2014.)

7.2 Trend research and forecasting

Trend research is considered to be one of the least-understood professions in the creative industries. Although the process behind trend forecasting remains somewhat of a mystery to most people, it is widely recognized as being beneficial to businesses. (Tan 2011, 40.)

Color forecasting can be seen as a medium used to translate the need and emotion of society at a particular time into stories and then into colors. The mass market is hesitant to colors they have never seen before; therefore trend forecasting is needed in order to offer desirable colors that are familiar enough for the consumers. (Tan 2011, 40.)

The process of trend forecasting needs to be linked with commercial sense, analytical thinking and awareness of brands and audiences (Tan 2011, 40). To keep up with trends, you need to observe consumer behavior by focusing on the changes in habits and lifestyles. The information can be collected for example from fashion, automobiles, interior design, sport equipment, materials, art, industrial design, architecture or textiles. The sources can be found almost everywhere – they can include magazines, television, movies, books, fairs or seminars. (Yuan 2014 ; OMUUS 2013 ; Morrison 2010)

By going through a substantial amount of material from different industries and sources, common nominators can be found as in Figure 11. However, these nominators need to be critically analyzed to understand what they really mean. For example, if a specific color or material seems to stand out across the research material, you need to find out the novelty factor and see where it stands on the trend curve, shown in Figure 9 on page 28. This you can do by

looking back to the past and see whether the exposure of the specific color or material has increased or decreased.

You also have to find out why the trend exists and the phenomena behind it, by whom it is adapted and where, how it is affecting the consumers' behavior and what it means in terms of services and products. For example, the current popularity of androgynous and gender-neutral styles, materials and colors can be seen as an outcome of more liberal values and equality between men and women. However, applying this trend onto a product for a very conservative target region would lead to a market failure.

Therefore the process of trend forecasting and research cannot come only from inspiration, it always needs to be linked with analytical thinking and commercial sense. Despite the research, there is never a guarantee of accuracy in trend forecasting – for example politics, economics and social aspects can affect the outcome of the forecast in a very short period of time. (Tan 2011, 44–45.)

There are also several companies that are focused on trends research, like for example WGSN, Future Laboratory, Stylus and Pantone that offer relevant and reliable information.

BLUE BLACK

2006/2007 COLOR DIRECTIONS
SOPHISTICATED

- Is it blue or is it black...it's a mystery!
- Pearlescent finishes add more intrigue
- Very popular in automotive
- Also seen in casual styles



HTC Trend Forecast and Sample Direction for Taiwan Design Team

BLINK-iD



Belkin N52 Gaming Device - Final Production

BLINK-iD

Figure 11. Example of a trend research (Morrison 2010)

7.3 CMF palettes

After collecting the trend research information, it needs to be grouped. By finding common nominators, you are able to analyze what the trend is – where, why, how and by whom it is evolving (OMUUS 2013). CMF design professionals usually work with pictures using Adobe Illustrator, Adobe Photoshop or Adobe InDesign to group the information into a presentable form.

Color, material or finish itself says nothing; it has meaning only when it is a context. By creating stories around the trend research information with palettes you can understand and explain what certain colors together reflect, as shown in Figures 12, 13 and 14. Stories give colors more comprehensive and distinctive character and help them to fit in a specific context.

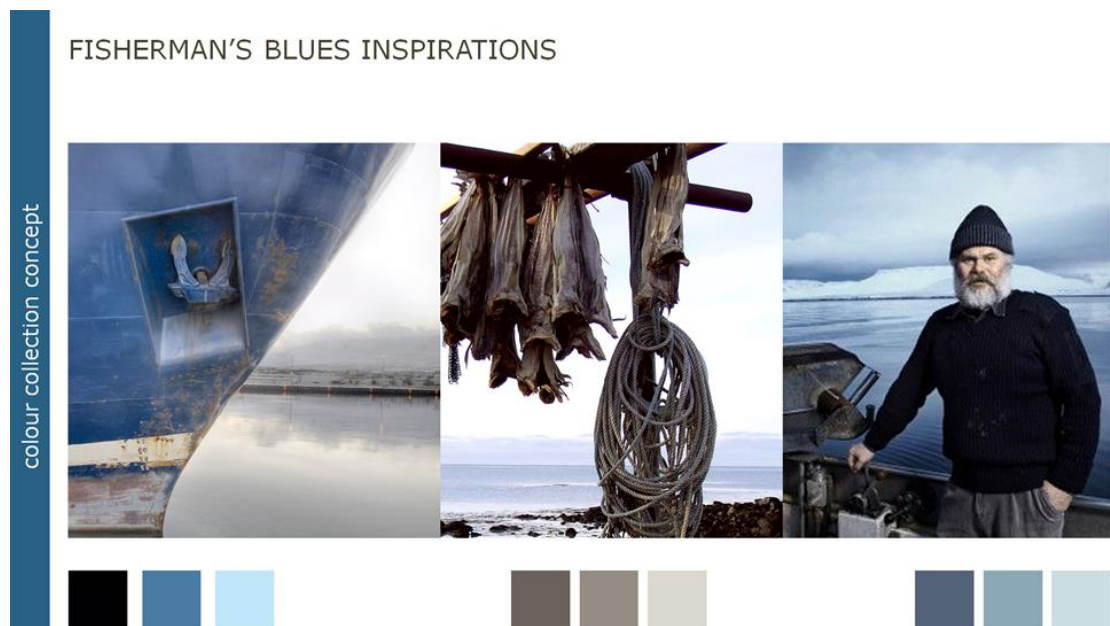


Figure 12. Example of storytelling in a CMF palette (Design Group Italia)

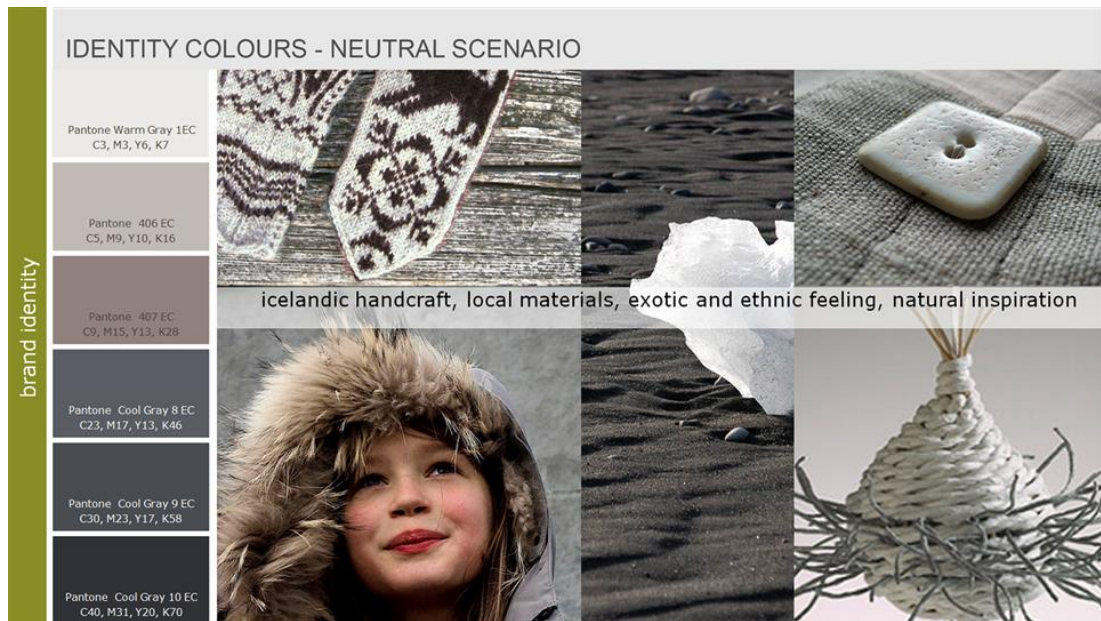


Figure 13. Example of storytelling in a CMF palette (Design Group Italia)



Figure 14. Example of storytelling in a CMF palette (Design Group Italia)

Colors without any product also mean nothing – a color can be trendy on a specific item but outdated on another (Tan 2011, 44). Often the best selling colors on products are tones of whites, greys, silvers and blacks and to keep them looking exciting and fresh, new materials and finishes are also important in addition to particular hues of the tone. (Tan 2011, 50–51.)

7.4 Tested preproduction colors and materials

A common problem in design processes is that when you create an idea for a product that has a deadline, you cannot apply just any color onto it without the risk of manufacturing problems.

The specific qualities of materials are often a challenge in color design as they affect the hue. Colors react differently when applied to different materials and manufacturing methods and sometimes it is not possible to achieve the desired hue. Therefore testing the palette on right material technologies and with correct manufacturing methods before the production starts is important to make sure there are ready-to-use color and material options that can quickly be applied onto the products. Example of the color and material design process is shown in Figure 15.



Figure 15. Example of color and material design (Morgenroth 2015)

After grouping and analyzing the upcoming trends, designers create CMF palettes, which are story boards showing the results of the trend research. They show the color and material samples, that will be later tested with R&D to verify specific formulas of colors and materials that can be manufactured. (Nuovo 2015.)

Using tested and preproduction colors and material technologies does not only shorten the time-to-market, but it is also cost-effective for the business. (Nuovo 2015 ; OMUUS 2014.)

8 INDUSTRY DEVELOPMENT AND FUTURE

15 years ago, the profession was highly influenced by innovations in technology. Consumer preferences were not as important as they are today, and the manufacturers' emphasis on color and materials was very much influenced by technology. (Tan 2011, 44.)

Today, materials are much more complicated and complex, which has led businesses to become more interested in material-led design than in the past. Now the design is more often completely material driven – materials are considered as a parameter and base, a framework to the design. Sometimes the product is completely designed by the material specialists, so the development is going from CMF not even existing to it being almost everything in terms with the design process. (Beidler 2015.)

Despite the development towards more CMF oriented design, this level of in depth color and material designing is most often found only within larger corporations, since it is relatively expensive. However, for those companies, CMF design offers an extra layer of refinement that really makes a difference. (Nuovo 2015.)

8.1 User interfaces and digital surfaces

Due to digitalization, products consist more and more often of digital interfaces than actual physical surfaces. Our societies are today highly influenced by our smartphones and other digital devices. Even our social behavior is changing rapidly by social media, and the use of smart technology is spreading to wearable technology. As from CMF design's perspective, there are both challenges and possibilities in the field of user interfaces and digital surfaces.

CMF design is widely used in consumer electronics. However, when the screen – for example of a smartphone – covers 90 percent of the front area, CMF design is not only important for the physical material, but also very important for the user interface, digital surface and graphics. (Nuovo 2015.)

Both the physical and digital features need to have the same visual language and complement each other. However, the challenge is that colors work very differently between a digital and physical object. The color range of a digital surface is created by mixing light, and therefore it is significantly wider than the color range of a physical object, the color of which is a result of the interaction between light and the material properties. (Leavey 2016.)

Another challenge is that when designing colors for a digital device, the colors never look quite the same between different operating platforms. When designers design something using their own devices, the colors never look exactly the same on someone else's device. Maintaining color consistency is a challenge both in physical and digital platforms. (ibid)

As one might think, CMF design does not only limit to colors and light in digital interfaces. The material properties of a digital screen also play a significant role in the user experience. The quality of the glass and screen resolution affect the feel of the product and saturation or the colors (ibid). In addition, the visual stimulations of textures and patterns imitating physical surfaces affect the interaction and experience of the product (ibid).

Digital colors have already had a great impact on how we think of colors. More and more often we come across a brand in a digital space – for example via social media – with a Red, Green and Blue (RGB) color system than a Cyan, Magenta, Yellow and Key color system (CMYK) (ibid). This is something that brands need to take into consideration when designing color schemes. An example of digital color design is shown in Figure 16.

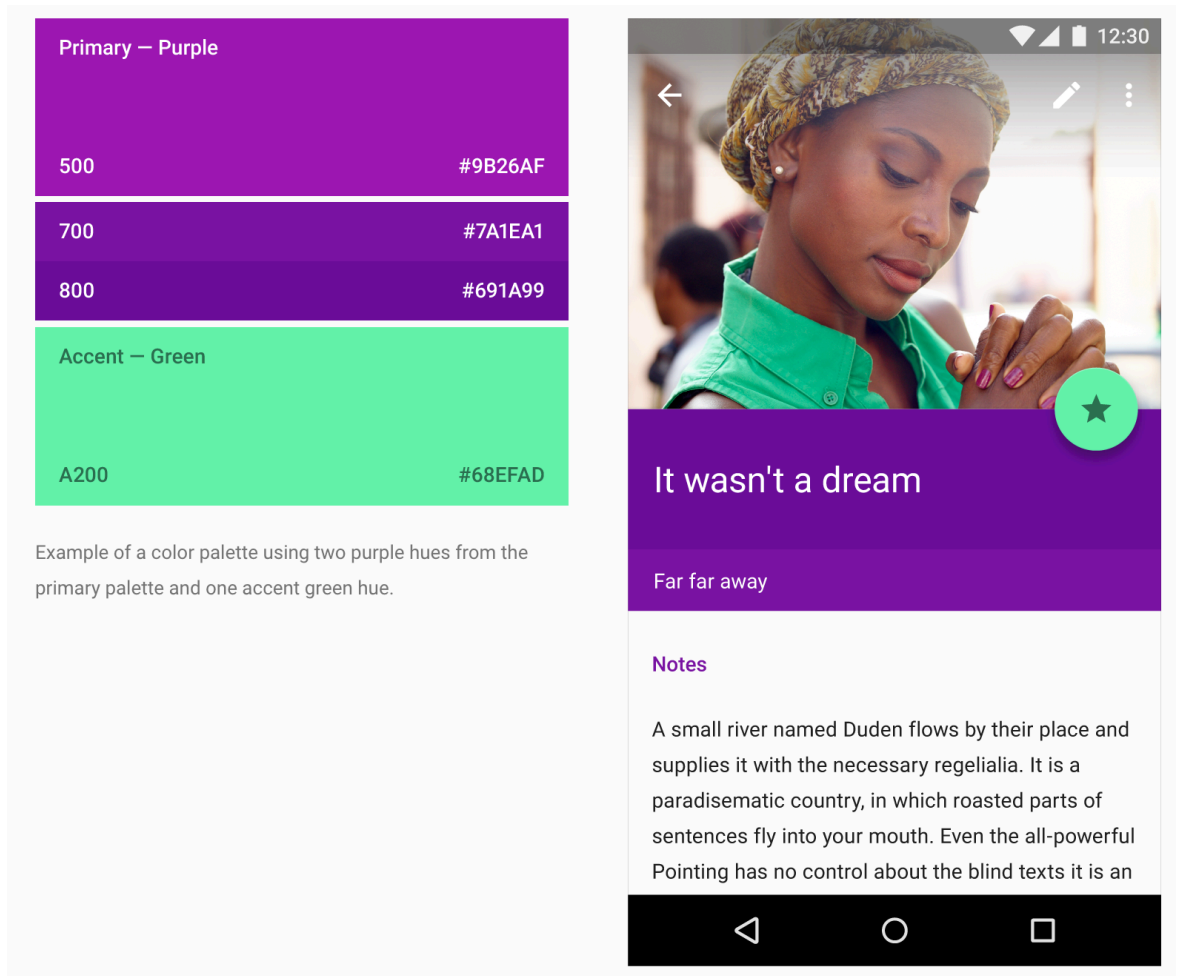


Figure 16. Example of digital color design on an app (Google)

As digital design trends tend to follow graphic design and fashion trends in colors, the future will be determined by a variety of factors. Digital devices have taken over in a very short period of time. The possibilities are difficult to predict, since it is estimated that there will be over 20 billion connected Internet of Things by the year 2020 (Stamford 2015).

8.2 Future of CMF design

As a growing number of companies have started to understand the extra value CMF design brings to their businesses, CMF design has been gaining more space in the design industry. However, the field of design is still relatively unknown and as it gains more attention, it can be expected to continue growing.

When more and more of the information, social communication, entertainment and overall interaction with the surrounding world is in our technical devices, it naturally reflects to design and therefore also to the possibilities of CMF.

As addressed in the previous chapter, digital surfaces is one field that CMF design continues to be beneficial on in the future. However, technical development has endless possibilities when it comes to design – not only in digital interfaces, but in every industry – especially in wearable technology.

Wearable technology has many forms and applications based on their purposes. They can be body function monitoring accessories with health improving qualities, pieces of clothing that adjust to our mood or even smart glasses that inform or entertain us with virtual reality. To make the user experience as natural as possible, it is very important to pay attention to senses and to the relationship of the product and the consumer. Therefore there can be many great opportunities for CMF design in this future industry.

As new material and color technologies emerge and improve and trends change with our society, there is never anything final in CMF design. You could design a chair that will become a “design classic”, but from CMF design’s perspective, when time passes, the design can be updated through lifecycle management to serve better the desired target group. Even only with this principle, there is always a need for CMF design in the future.

9 IN CONCLUSION

Writing a study and collecting material for a book of an entire design field is both challenging and time consuming. Organizing interviews abroad, reading books and articles and finally analyzing and gathering the information to easily understandable form was not an easy task.

Although I already had some experience and knowledge about the industry from working as a trend research assistant for the commissioning company

OMUUS Oy, there was still information that needed to be clearly understood and processed before starting the actual writing. Finding the right type of information happened by collecting small pieces of information from a large number of different sources and finally assembling it all into one, consistent study. For me, writing this thesis was a very valuable process in order to fully understand all the different aspects and cause-and-effect relationships of all the different parts of the profession.

As I already had formed a personal image of the profession through my own work experiences, it was also important not to leave out any information that would be crucial for a reader with no previous knowledge. It was a challenge to write a text that addresses a subject this large while making the outcome clear for a person not familiar with the industry. The fact that the subject was so wide made it also difficult to add any deeper perspective to the text.

Writing this thesis took much longer than in the original timetable due to the time-consuming nature of this study. Despite all the difficulties, I was fortunate to be able to meet the very interesting and beneficial interviewees who had such a wide experience and knowledge about the industry. The interviews were made possible by the helpful and understanding commissioning company OMUUS Oy, which was supporting and undeniable important throughout the whole writing process.

The final success of this thesis will be found out later when the commissioning company will use this thesis as material for a book about CMF design. By now, the feedback has been positive and from a personal point of view, this thesis was a success as it has definitely helped me to be a better designer.

It was especially surprising and rewarding to learn about the future application possibilities and about the industry's psychological depth and outlook on design. One might think that trends, beautiful products and appealing designs might be only superficial, but it was exciting to see design from a more human perspective through CMF design. Although CMF design is much about designing for desire, I personally believe that beautiful products can make people happier.

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Jaana Beidler Interview 2015, Helsinki

Heini Isoaho: CMF designers have come from various backgrounds and design degrees. Could you tell me about your background?

Jaana Beidler: I am a clothing designer. I graduated as a fashion clothing designer and I worked as that here in Finland for a few years. I worked from, I think, in the late '80s, early '90s, and then I moved to the United States. There, I also worked as a clothing designer first. Then I worked in a company called Patagonia and there I started to specialize within color and material design. Yeah, that is my background.

Heini Isoaho: How has CMF design evolved during your career and what is the future of CMF design in your opinion?

Jaana Beidler: That is a good question. I think it has evolved a lot. First of all, I would say, when I started in design, there was not even anything called color and material design. Nobody really thought about it. Nobody considered it being a separate entity on its own. Then I think, early on, color and material design was very much about almost like coloring and adding on and an afterthought. Basically, industrial designers had designed a product and then it was sort of in a way kind of handed over to color and material designers, who then applied the color and applied a material. That is changed a lot as well because we are really now working closely together as a team—color and material designers and industrial designers. Basically, color and material is really, in a way, driving—especially material is driving the design. We talk so much about a material—lead design. Basically, you start first with material. It gives you sort of the parameters and the framework which to design to. In many cases, color and material designer is the specialist. Meaning, they know the most about that material. Materials nowadays are so complex and complicated. They are specialized in the material so they oftentimes help the industrial designer to understand the qualifications and also the features and benefits of a material. It is fully integrated. To the other extreme, what we started seeing happening at Nike—in the very end that I was there before I left, we started seeing it. Now, I believe it is happening more and more there is that—because Nike's new technology called Flyknit, which is a completely needed knitted shoe, so there is no way it is needed to a form. It is really designed by the textile designers and the material designers, not by the industrial designers. Basically, in a way, it is interesting. It is interesting like industrial designers have not really made the transition into material as much as they—and some methods like knitting especially and soft materials. So nowadays, color and material designers are designing their product. It is gone from not being anything to being everything, right?

Heini Isoaho: Yeah.

Jaana Beidler: I also would say that color and material is a great tool to use to add value and tell stories with products.

Heini Isoaho: What are the advantages of CMF design compared to other renowned fields such as industrial design? How do CMF design complementing other specialties?

Jaana Beidler: I think I sort of answered that question already. It is a lot about integrating all the design processes together. Like I talked about, color and material design is a great vehicle and a great tool to add value to the product and bring character—create character, personality, soul, and irresistibility. Like really finishing—it shows the craftsmanship very nicely like how you finish the product through color and material design.

Heini Isoaho: Can you compare the CMF methods based on your experience in Nike, Patagonia, and Nokia, and what methods have established themselves as industry standards?

Jaana Beidler: Very good question. I am actually writing a book right now with a colleague of mine from Nike. We are writing a book about color design. There is a lot of books about material design, materials, new materials, and all of that. We are really focusing on color this time first around. We are focusing on it from a strategic point of view. The book is going to be about strategic color and how to use color strategically. I would say that is what we noticed now—during the time that we have been writing it and putting it together—is that there really is not any material or any information out there about this particular field. Perhaps, in a way, we have sort of been pioneers of the processes and methods that we established at Nike and all of these other companies where we started doing color and material design, and also a lot in automotive industry. They have not made it into books yet, right?

Heini Isoaho: Yeah.

Jaana Beidler: Maybe our one is going to be first one.

Heini Isoaho: So is it going to be published?

Jaana Beidler: It is going to be published hopefully in the end of year 2017.

Heini Isoaho: Okay. So it takes some time.

Jaana Beidler: I am sorry. I take it back—by the end of the year 2016. So a year from now—a little over a year. Now, I have never worked in an academia before. An academia is a lot about theory, processes, methods, writing it all down, and then building, like I said, theories around it. It is pretty interesting because I talk here with people who are professors and experts in their field. They talk to me and ask me how we did this and this, for example, at Nike and how we did it at Patagonia, and all of that. Then when I tell how we did it, they are like, “Wow. Well, that is a method. You guys have created a method. We could write a paper about this. We could write a scientific paper about it.” But as you work in color and material, the world is busy so you do not really stop to think about...

Jaana Beidler: ...you are doing a method here right now. You are improvising. If it works, you do it again. If it does not, you change it a little bit and do something different.

Heini Isoaho: Yeah. Can you tell me about your roles in Nike, Patagonia, and Nokia?

Jaana Beidler: For color and material designers?

Heini Isoaho: Yeah. What did you do?

Jaana Beidler: So my roles, my particular roles?

Heini Isoaho: Yeah.

Jaana Beidler: Like I said, I started the color and material design function in Patagonia. They did not have one before this. There, I was in charge of sort of the creative direction for the company as far as sort of—how would I say? Sort of like the inspiration point. We came up with the story for the season and then a color palette supporting that, and then developed materials, prints, and yarn dyes also around it. It went from a big direction setting to individual piece of clothing or an item. So you look at it from a bigger picture into an individual product. Then of course you needed to sell it through. There is a lot of selling and convincing people like, “This is good.” At Nike, our organization was definitely a lot larger. There, I was heading the color and material design team. We pretty much did a lot similar way as we did at Patagonia. We really came up with a direction for the entire company. At Nike, it even went further than what it did with Patagonia because that really then became a way that we used those criteria product reviews, etcetera. We created the product directly to the retail stores. I am thinking about the end in mind already from the very beginning. We used color there strategically, specifically. Then of course, with materials, it was a lot about consolidation and looking at the bigger company, “How can we be smarter with our material purchases?” It was [inaudible] it was about making things beautiful and functional of course, but it was also very—looking at it from an economical end of that perspective as well.

Heini Isoaho: Yeah. Could you tell me more about your years at Nokia?

Jaana Beidler: Yes. I worked at Nokia few years. I was hired there to bring a new color and material direction. At that particular point in time, Nokia was just developing the new phones that became then Lumia phones. We had an intention of introducing to the marketplace brand new platform. The design language was all about very minimalistic and pure expression—looking into materials using plastic in a premium way and using unusual methods with the plastic. Then we wanted the color palette also to reflect that as well. So basically, we chose the CMYK color palette, which is all about purity and that. The direction really was set for this new platform. Then lots of things started happening at Nokia, and we got a new CEO who cancelled this new platform. The story never really caught the full potential that it could have caught. But again, to me, this was an experience with completely new and different materials like hard plastics that I had never worked with at Nike or in Patagonia—and metals and all of these. It was really cool.

Heini Isoaho: What do you think is the most important to know about CMF design? What areas of CMF design do you want to emphasize in your work at Alto?

Jaana Beidler: Wow. That is hard to say what is most important. I guess the most important to me is still we are—I do not think people really understand the power of color and material yet in businesses in Finland. I think, in the United States, they already do. They invest a lot of money in color and material design per se. I would say that is super important to really bring attention to the importance of color and material design. That goes in hand, in a way, with all of these more sensorial approaches—so how important is tactility and how important is experiencing the product or to experience the service through all your senses. I believe that is going to become more and more important as we get all these gadgets measuring our brainwaves and what is happening inside us. Now, things seem very subjective to us. Many times, colors seem very subjective—everybody has an opinion about it—but I believe that in few years, it is going to be very objective and we can measure it very objectively.

Heini Isoaho: What personal qualities do you think are important for a CMF designer or for somebody who wants to be one?

Jaana Beidler: I would say collaboration so that you can work in a—you love team environment and that you would be willing to collaborate. Communication—like I said, many times, color specifically but also materials can be very personal experience. You need to be able to convince and influence lots of people. I believe that you would go far if you are able to talk a little bit about the business language as well, or turn your design communication or design language into business perspective. This is probably the most important thing is to be very creative. Think out of the box. Not be afraid to explore and try new things. There is going to be so many things happening in materials now. In the next five, ten years, we are going to have a whole new material palette on our disposal. It is going to be very exciting times for color and material designers. It also requires a lot from a color and material designer that you know more about the technologies, and you are willing to test, explore, and try.

Heini Isoaho: How do you see the future for CMF design?

Jaana Beidler: Like I told you a little bit about what is going on at Nike right now with all of the material designers designing products also—and also we become more savvy on understanding how emotionally charged we are when we make purchases. So people are going to—as competition gets bigger and bigger, people are going to be more and more in tune about those aspects. Color palette has a huge big role in it. I believe it is just an area that is going to grow.

Heini Isoaho: What about digital interfaces or...

Jaana Beidler: Digital, yeah. Absolutely. It is a completely—thanks for reminding me. It is a completely another frontier, in a way. There are some really exciting things happening also with digital color and computational color. People talk about computational color and using algorithms to design color and all of these. Color behaves very differently in the digital format. Then it is exciting when you have a product that has both—it has the physical and digital, and how do you harmonize and bring them together, so definitely. Then again, if you start thinking about augmented realities and those things that we are going to be supposedly living in more and more, it is just adding more dimension to it, do not you think?

Heini Isoaho: Yeah.

Jaana Beidler: Yeah.

Heini Isoaho: The last question, why do you think CMF design is important for companies and what value does it bring?

Jaana Beidler: What was the first one, why is important?

Heini Isoaho: Yeah.

Jaana Beidler: I think I talked about that also why it is important. I think it is important because we make most of our decisions—and I am just talking now about companies that make products, right? Most of our decisions are emotionally-charged, right? We react emotionally with color and materials, the tactility and also the vision about the color. It is important in the future that the product does more than it just performs. It needs to have a soul. You need to connect with it. Color and materials help you do that. That is why I believe it is important. What was the second part of the question?

Heini Isoaho: What value does it bring to the company?

Jaana Beidler: It brings a huge value. It can definitely be literally translated into dollars, cents, and euros. I have many experiences or many examples from, for example, Nike that we were able to really measure. Even from Nokia, we were able to measure what was the impact of a color at retail.

Heini Isoaho: But usually, is it only for big companies? Do they only use CMF design or do you know if smaller companies also do that or if they should?

Jaana Beidler: I think any company that you do a product, service, or interface, you need to consider color. Whether they invest in it as a specialty, meaning that they invest into hiring a color and material designer specifically, that is a different thing. Generally, I would say our education here for every designer has that aspect. Some designers are good at it. Some designers do not want to even do it. But I do see that we are going more and more to specialized deep knowledge. With the technical requirements—the more technical materials and the new materials that are coming down the pipe, when we talk about nanoscale and all of that—it requires more and more knowledge. That is why I believe that color and material design—we have design knowledge but then we have this other sensitivity and knowledge that is very unique and it is more and more needed.

Heini Isoaho: Thank you.

Part of Frank Nuovo Interview 2015, Los Angeles

Heini Isoaho:

Could you tell me more about this color, materials and graphics research group you had?

Frank Nuovo:

Yeah, so, colors, materials and graphics it all started, what time is it? It all started back in the early days of Nokia, when we were interested in making colors and materials solutions and we found that executives would make their own decisions about colors and materials, based on what they think their kids would like or what they like, what they think their wife would like, and so we would design these great phones and then I would go into board meetings and I had a bunch of marketing executives selecting colors. This is back in the early 90's, and I thought guys, this is ridiculous, this is not how it is done. We need to understand what the trends are and we need to carefully look at it on a regular bases proactively, not design a product and figure out what color to make it. We need to have a team that is constantly looking at trends, forecasting trends and getting ready by understanding what colors and materials are available technologically and what colors and materials are right for various markets segments. And I convinced Nokia when I joined in 1995, that they needed to allow me to built a group and the first...

(phone call)

So, where was I? The need for colors and materials and trends research, was something that actually got started for me back at DesignWorks, we did a lot of that. I hired somebody – her name is McGill – Sandy McGill and I hired her out of UCLA to do colors and materials and trends research for Nokia projects back in – I would say, 1990, 1991, something like that – and she stayed on, and she's now head of color and trim at BMW, so I was very much tuned into that back then. I am trying to think... All the sudden in Finland we had –what is wrong with me – I can think of her name... Gregor McNeson, and – it is so important – I can see her face and I know her name so well, forgive me but I will come up with it.

She had done so much wonderful work, in the area of colors and materials selection, in early days the methods were not there, there were no standards and processes, so what we had to do in the early days was to establish standards that made everyone else in the company respect our opinions about color, because we would go out and research, we would be part of a color marketing group and various others trade groups that were looking at fashion and industrial materials and, you know, for anything, textiles... Zena Crank, sorry her name was Zena Crank, do you know Zena? Do you know the name?

Heini Isoaho:

No

Frank Nuovo:

Well, if it is colors and materials research Zena really headed that up with Gregor McNeson, so when I came into Nokia, I had already been struggling at DesignWorks, we had Sandy and we were doing all of this great work in colors and materials and trends research, but I wanted my own team, so Zena and I brought in Gregor McNeson, his father was a designer at Knoll Furniture – was very highly respected – and Gregor, they really started the colors and materials and trends research, and it grew, it became a big team at Nokia, then who else... Her name?

Heini Isoaho:

Liliana?

Frank Nuovo:

Well, Liliana. But before?

Heini Isoaho:

Annina?

Frank Nuovo:

Annina. These were all people that came afterwards and did really great things, but it started by with Zena Crank in Finland, and I do not know where she is in Finland now, but Zena and Gregor were the foundation and it was really all about proactively forecasting, because a high technology company like Nokia or Apple, not only needs to know what the next color trend might be, but what material they're going to use. Is it sprayed on, is it baked on, is it metal, is it a metal coating, is it ceramics, is it leather, what kinds of leather work? My work in colors and materials research really got intense at Vertu, so I'm going to show you my Vertu designs. We have ceramics. What can you do with ceramics? Can it be polished? What color can it be? How do you get color into ceramic? I'm asking these questions – I have the answers – but those are very complicated questions, if you texture ceramic what happens? Well it becomes like a sharpening stone for metal, so anytime you bump up against a flat piece of ceramic with metal, it would produce a mark on the ceramic, because it is harder than the metal, so you have marks all over, so you really need ceramic to be polished, otherwise you will mark it up all the time, little things like that. Gold, What type of gold? What type of mixtures of gold? Liquid metal, sapphire. Leather again, if you take leather, the wrong kind of leather out in a wet climate like Singapore, moist climate where is a monsoon weather kind of thing it fills with water, that changes the behavior of the ratio, because water is not friendly to ratio, little things like that, as far as drop tests, you know. Titanium, aluminum, types of aluminum. I can go on and on. So, not only trend forecasting to find out what the right materials are for a particular group – let's say target group – but also what is right for particular climate. So on the high end with Vertu which we call authentics and on the mass market level we had entry levels for the plastics, really rapid manufacturing techniques to post processes dipping it in something to get colors, in the early days they called it cubic printing, then we had in mold decorating, in mold labeling, all of these things. We pioneered at Nokia, all around the world with partners and it is very exciting to put together a team that took trend forecasting through various social awareness campaigns around the world. You know what's bubbling up in China, what's happening in South America, what effects does the war have in people's laying habits, the big one was a green movement, and so all the sudden everything you know, is recyclable. The funny thing about a lot of recyclable stuff is that is not as good as something that just you make and it last for a long time, so a lot of designers are making paper phones – hold on a second – you use paper, the phone gets torn up in a short period of time, because it does not last, you throw away the paper. What about if you make a phone out of aluminum and it lasts for five years, is that better than to throw away paper? Because if you think about the processing of paper... Right – you know, you are Finnish – about papermaking. So it is really a wonderful focus for a career. Now having said all of that, I could not find anyone formally through any college that understood colors and materials and trends forecasting, there were no degrees, you could only find a talented individual – I do not know what your focus is – that really like colors, maybe really fashion forward. And that is where it starts, with Sandy McGill, going back to her story, Sandy, she just liked to play with color and she got a hold of an early color printer that was in the lab at UCLA, and she was doing color blends and like all kinds of algorithms of really great color mixing and overlapping of sheets of color and she showed me these things that were just incredible, that was early color printing, you can do better stuff now on an HP printer, but back then it was really crazy good, and I said, you really like color? And

she goes: "Oh, I love color!" and I said "So do you want to work with me?" Because she came on a tour at DesingWorks BMW, I was leading the tour, and she said "I would really want to work here" and I said "What do you like?" and she showed me her stuff. And I said "Wow, I have got a job for you". So that's how I found Sandy. But, when I was the design chief at Nokia, I couldn't recruit. How do you go to someone, I guess you can put out a call out on newspapers and things, but we did not have a place to go, so I went to "The Art Center" and I wrote a proposal for the colors and materials and trends Lab, this was actually 1999. And I put it on the table and they said "This is fantastic we want to do it". Then there was a crash, a financial crash in '99, and it kind of all went away. It took me from '99 until 2005, to resurrected and find out how to put this Lab together, and in that time I put a formal proposal together with – you can go meet Karen Hoffman, who runs the product department there – Karen was the Art Center's side of disagreement, so it's funny, you can't give money to a school, unless you know how to give money to a school, you can't just give money. But you want to give money to a school in such a way that it is not abused, that is not misused, so Karen made sure that the agreement of how we fund colors and materials Lab was very effectively planned, and so then we got the check from Nokia and made it happen. But that whole thing, that whole process was about my fascination of understanding colors and materials and at Nokia we had to put together these – you may have heard – called the menus, color and material menus. So, we had seasonal menus of what we thought it was going to be for each category, we had basic category, we had fashion category, we had premium, and we had sport. And the color group would put together these fabulous boards that show lifestyle imagery and show color, material samples and then we would have a sort of a Nokia approved list of materials that they would interact with the actual production teams at Nokia to verify specific color formulas in plastic, in paint and in metals that can actually be made and so, I hope I am not getting too complicated here, but the problem is as if a designer has an idea and there is a product programmed that has a deadline, you can not just put anything into that you need to use preapproved, visibly doable colors and materials. So, the way we mastered that was, because Nokia has a lot of money, we could have an extra team doing this, was to establish these preapproved menus. So the industrial design team could make a phone and then make an assignment from these preapproved materials, if they had a new idea or an idea that was specific, most likely you could look at the previous preapproved colors and the palette would grow larger and larger and larger, very sophisticated team actually and very ambitious, we spent more in colors and materials research, than most companies spend on designers in whole loose, was a huge effort, but it proved extremely valuable, everybody ripped us off, all the other companies would see the things that we were doing, we were leading. I think we had a better approach than most other companies. At one time I know that my colors and materials group was more sophisticated than for instance BMW's, because I had visibility of both and so we were really, very active there. And so when I left Nokia I kept pursuing it and I started to work with other materials like Bayer material science, other companies and tried to get them involved in "The Art Center" to give samples of new technologies and things like that and try to interact, I backed off I have been very busy with my own stuff, but the lab is still there. It is a room and a library of materials, Liliansa, is she still teaching there? Do you know?

Heini Isoaho:

Yes, she is.

Frank Nuovo:

So she keeps it alive, which is great, and they got a lot of funding really to keep it going. So, that is kind of the history of it, in a short form. Fashion had a lot to do with it, fashionability is actually a better word. So, it is not fashion itself but the influence of fashion. And predicting where fashion is going, making sure what 25-year olds who have a phone, would want – you have got the gold toned phone? But is not a gold tone it is more of a champagne, it is not too "in your face", but it is nice and warm. It is not too masculine, it is lovely. And the funny thing is that it works for men and women. Now if you make that red gold, maybe it's even more feminine and might be more focused. But the question was always, how do you find a balance? Which isn't too polarizing. So, if you commit to five colors of the product, how do you get that to work for both male and female, and then maybe have

one strictly female and like pink always comes up, but light blue is also very popular certain times, we try to avoid things like the lime greens and the certain colors, unless they were specifically event oriented, like if there was a campaign which is, you know, "Give to The Lyme Foundation", made it up, right. Then Nokia would do a special edition and you will make a whole bunch of those. But, we really were becoming masters at understanding how to make a lot of people happy with a selection of colors, that were not too polarizing, but they were interesting, they complemented the design in terms of its shape and proportion. If you drop it does it scratch? How easily does it scratch? How quickly does it get dirty when you hold on to it? The only reason a white phone is good is if it's smooth, a white phone with texture is a problem. Leather is a problem, leather takes oils, all of Vertu leathers were very highly researched, they resist, they are practically not leather anymore, they've been put in all kinds of dyes, all kinds of solutions that make it water resistance, you could put it in the rain and is not gonna – you know... And the resist oils from your hands. So, colors and materials research is more and more the core of design thinking, we even start with a material concept in hand with its functionality and you put it all together. When "Vertu" was born I desire to work with sapphire, metals, leather, and putting all of that together in the way that is manufacturable and in a way that is, obviously, worthy of the price point that it demands, but it's cost was not from, I want to make that thirty thousand dollars phone, it was I want to make something extraordinary, that is you know, built like a fine watch and the cost comes from what does it takes to do that, essentially. That is a long answer.

Heini Isoaho:

Yes, it is.

Frank Nuovo:

But is a very long story. I mean I have got endless stories on every topic, so...

Heini Isoaho:

Do you do a lot of trend research now here in your studio?

Frank Nuovo:

Trend research? Yes. One of the projects recently was for Samsung and I hired Liliana, actually, to research banded material for a basically I did digital health product, I can show it to you, it is a very sophisticated band that we designed. Now we have not actually used a research. But we went out, and we did not apply it. But we did us it in certain analysis of what our options were. In the end we ended up using a silicone molded band, because we had to integrate a flexible, flexi PCB, so you know a flexible cable, built into and molded into the band, so we did not have a lot of choices, it had to be moldable, it had to have certain properties that kept water away from, the flexi PCB. So, but we were researching what were the possibilities and so, yes we do in all of our projects, we do certain advanced research in colors and materials, it is a very expensive thing, so you only do it with big companies. Startups do not do a lot of intense materials research, because it does not have the funds to do it, unless it is your company and you are just doing it yourself, right. Which we do, but in terms of in depth colors and materials programs, you are like Samsung, HP, the Nokias, and Apples of the world, because is that extra layer of refinement that really makes a difference. Other than the essential knowledge, the thing that you get with me is thirty years of research. And when a new material comes up, I find out about it and apply it in my team, so you get the older designers that are hands on like me, I do not just direct I actually work with CAD and I have a Solid Work station in the corner with monitors, I mean I design stuff I love working Rhino. Have you ever played with Rhino?

Heini Isoaho:

Yeah.

Frank Nuovo:

It's totally cool, it is easy, is not conventional, works well on a laptop, so I really enjoy that. But I think, colors and materials research groups are great and they focus and they probably serving to the big companies more than the little companies, so. In a nutshell.

Heini Isoaho:

Do you think we could visit the Lab at the school? Is it possible?

Frank Nuovo:

Yes, Gerardo can probably arrange it, we will be happy to. They are on brake. For how long are you in town?

Heini Isoaho:

This week and maybe we will come back.

Frank Nuovo:

But, the school is generally open and I can make a phone call to Karen and so could Gerardo, I mean he heads the whole department and my daughter is in Pasadena, she gives tours at the school, I could ask her to join, she loves to meet people. She just got back from a three month tour in Europe. She went to Denmark for a couple of weeks, England, she was in all through Germany, Paris she has been a month in Paris, so she just, say the word international. She would say I will take them, I will take them. She will love to take you. Just do not listen to anything she says about her father. Anyway, we can arrange that. It is a very, I do not know in what condition is in right now, but it is a room with lots of boards of lifestyle research, it is a typical thing that you will see it like that. And I have lots of slides. What is your schedule today?

Heini Isoaho:

We do not have any plans.

Frank Nuovo:

I thought, we could all go get some lunch together, with the boys. Are you guys interested?

Heini Isoaho:

Yeah.

Frank Nuovo:

There's a place called 800 degrees, which is a cool do it yourself pizza place. Have you seen it?

Heini Isoaho:

No...

Frank Nuovo:

You know of what I'm talking about? It is down in Westwood, we could all go down there.

Frank Nuovo:

So, what time is it? Is 1 o'clock, let me see if the boys are ready, I mean essentially, I have really just like, I am used to talking about this stuff, I do a lot of interviews. So, I knew what it is that you wanted to know. I did not realize the focus so much in color and materials, sorry I should have, I gave you like a little bit too much information.

Heini Isoaho:

No, I do not think so.

Frank Nuovo:

Is it ok?

Heini Isoaho:

Yeah

Frank Nuovo:

Put it in context, and all of that. But I thought from the fashion, fashion tech, that is going to be good. Oh, that is the short form. I had a pretty cool presentation about fashion. This is a lecture I gave to the students...

This was a recent bio project that I put together, the work that we did for the old flagship store at Nokia, but I think the cross sections are different files, most of the time that I was there, we launched 400 different phone models

Heini Isoaho:

That is a lot!

Frank Nuovo:

It is a lot of work, but it is really diverse, from radical fashion ideas all the way through the first glass and metal, way before the Iphone, right, fashion in the early days. So a lot of diversity starting with these projects in the early days, in the very early days, I was talking about, going on through just a huge portfolio. The Nokia core, was always the classic style was something that evolved relatively slowly, but the character, you know, was very noticeable... Can you see ok?

Heini Isoaho:

Yeah

Frank Nuovo:

I should be pointing at you, not me. And so you know, characteristics, that were Nokia characteristics, that we tried to keep right. Really, I was the keeper of the brand, I always trying to, I wrote up a book of how Nokia should look like, and be Nokia, so sad that it just collapsed the way that it did, just unforgiving actually. A lot of the characteristics were based also in traditional interfaces, I spend a lot of time with the whole "sending" and "center scroll", and the evolution of that through time the traditional phone of course all of that seemly went away once it went to "touch", but the single key interface, this whole idea was at the core of the Iphone, one key that really smart, and that is really where this came from. I mean, this was all based on that kind of thinking. And pioneering colors and materials this was kind of the trajectory this one slide, and in the early days I did a fabulous study, of 30 different target customers that we were going out there and we landed up, we really started to understand the basics of color, and it became more and more sophisticated you could see how it is a very primary sort of palette here. And it becomes much more sophisticated all the way through fashion, and then Vertu being on the outside there. We still have the world record with Nokia, the most product sold, way beyond anything Apple or anyone has achieved. But these lifestyle influences, these kinds of boards, I love putting these together, looking at style, looking

at what is happening and then prioritizing, what were the major influences and differences. You cannot just do a board, let's say fashion, without also doing a board about, let's say, sport or active. Meaning that if you say yeah this is fashion, but how do you really in a single company that has multiple lines, you need to look at them all together and you need to decide in your line what is fashion? What is fashion oriented? What is sports oriented? What is business? What is premium? This was always hard for marketing people to see. But you have to go in there and you have to just look at the entirely comprehensive view, you create your palette, not only just for the season, but for the year. It is a very sophisticated approach, you also look at understanding who the brand is, so colors and materials research is not just about what people want, is what you want to project. So you have to get that balance between your active expression, fashion, and premium. The four categories we had, plus classic. Then you look at them in context, you look at them together and you design your understanding of the palette around that. Your overall palette. That is repeating there, but it's looking at the fashion category, the sport category. These were all groups, this was premium. And then of course is all about user changeable right, this is the whole story in itself, which really drove the need for colors and materials research as well. The first big winner, right. And then went onto many, many more and like I said it started out at the early days, where primary, but look at this color combinations, it was a lot of fun. As designers, you get to see things like this all around the world. So, the design team, they were rock stars. All the way down to user changeable when you may print out your own stuff. You remember this one?

Heini Isoaho:

Yeah, I do.

Frank Nuovo:

Then form factor innovation, we talked a little bit about that, we experimented all over the place, this stuff is really crazy. A young person goes, that is cool, and says I want to do this, I do not care that it is not the normal, but by the time you settle in your ways, sort of old man view, give me what I know I can not see anyway. But young people want a challenge. It was a lot of fun making traditional phones. This whole story is one of the reasons why Nokia did not do a touch phone, they just were sure that people just wanted buttons, classic folds and form factors, different ways of doing things. You remember the texting phones, phones for China, matrix phone, on and on we just talked about the fashion collection. We just talked about all of this; it is early as of 1999-2000. So, every one of these we started to think in terms of line book, not just a product but a family products, that all of them belong together. This was unheard of the mobile phone, just nobody thought like this, it is all ground breaking in terms of an industry thinking like this. Consumer electronics thinking in terms of little line, that had different colors, so if you had a brand and your brand all look like that, oh yeah we understand that, but this was a company that had a line within the brand, and that kind of thinking was what, but on top of everything that you see here, having a line that looks like this, that looks like that, we talked about that, cancelled... This was a vision from 1999, by the way, that was all about what the Iphone became. And this was a touch phone, this was actually a project. But the vision was something that I drew, a very simple ellipse, and I said just make it very simple. And I had to do a show, like a promotion for where we were going in tech, so is a very very simple design, but this was effectively the Iphone. This was 1999, the apps, big touch screen, no buttons, right, 1999, kills me! You saw this, this was the original design for "Minority Report", these were all put in "The Minority Report" movie. This unfortunately was dropped out, but you still see that one in the movie. Some of the cool shapes, there was a time where phone design was really fun, we had a ball doing this stuff. It is boring now.

Heini Isoaho:

Yeah.

Frank Nuovo:

Really hard to come up with something unique, I mean, big screen, like designing a TV. A little space all the way around. Really it is all about graphics, about the interface, you just have to do everything virtually, it is the accessories, is all about. In Vertu, a lot of fun, I mean this was a dream project for me, I designed all of this, these was the first 12, 13, 16 years of the company, and the logo, everything about it, Gerardo worked on development of all of this with me. But it was all about expression, this is expression, that's the basic of the Vertu logo. And we hired this wonderful artist Christopher Bucklow, he did this pin hole, in a foil, and he exposed this photographic paper, and it was fabulous. He designed the stores, what a great experience that was. It feels like it was a whole lifetime that went into this, so I'm creating a whole new life again. But again, colors and materials, materials research, both technically and the inside out, everything, the fusion of craft and technology, all these details, ceramics, leather. That was so much fun doing this. This is beautiful stuff and then I looked at it, that it was my vision of the collections. So I had the "Ascend Collection" which is the sporty stuff, the "Signature Collection" which was like the jewel, the "Artisan Collection" we saw the rock, and then the "Constellation Collection" which was soft, more rounded more feminine. This was my vision, they don't have it anymore and they're lost, I left them, but I need to go and save them, but this is really too bad. Too many views, it's all over the place and it doesn't work. This was organized, I understood who I was designing for, I understood how it all was organized, the original signature, and then the evolution to the new signature, and that the fact that you can take colors and materials up in one design, it's a very small sampling of what you can do. So when we start to master the use of materials you understand the applications of the price points.

Sarah-Jane Leavey Interview, 2016

1. When designing a product with both physical and digital surfaces, what do you need to take into consideration so that they work seamlessly together in harmony?

There has to be some continuity in the visual language used in designing both the digital environment and the physical product. The line, form and color world of the digital environment should complement and hopefully reflect aspects of the physical object.

It is far easier to fine-tune the color world of the digital object to be in harmony with the physical object than the other way round. The digital domain produces its color palette through mixing light and as a result the available spectrum is far wider than that available to the manufacturers of material or printed surfaces. When you refer to digital surfaces we should clarify that touch screen devices produce a very different experience for the user than the screen and keypad solution still found in many older banking teller machines. Quality of glass and screen resolution will also affect our capacity to produce smoother transitional blends and a richer more saturated color experience.

In digital application or web design we are also very careful to consider the light levels required to render high Chroma (very saturated) or very bright color, as it is a potential drain on battery resources. Large areas of white screen estate are fine when you are plugged into the wall but not great for mobile devices. Also screens often utilize sensors to judge ambient lighting in order to adjust the power required for the screen to be comfortably readable for the user. (No one wants to feel that have a torch being shone in their eyes in a dark room when they 'wake-up' their phone).

2. What kind of differences are there between designing color for digital and physical surfaces? What kind of challenges do digital surfaces bring to color design?

The most notable difference between designing color for digital and physical surfaces comes down to the primary physics of how the color of a product is produced. Digital devices derive their color palette from the action of mixing projected light; the physical world derives its color from the interaction of light, the material of which the product is made (whether substrata dyes or surface coverings are used) and its surface properties derived during the process of manufacturing (glossy, satin, matte).

Any color design specifically focused from a digital prospective has the advantage of a far higher number of available color options or possibilities than a physical object could achieve. The problem for a designer of digital domain services, applications or products is that every manufacturer uses a different set of RGB color primaries and this means achieving color consistency across multiple platforms is almost impossible. Consider if every child in the classroom was using a different shade of red, blue and yellow crayons to do a drawing, no-one could reproduce the colors the others had.

When designing an application we can test a color on different devices with different operating platforms but ultimately we are always working with approximations, none will render exactly what we saw on the computer we

designed on. What looks like the right color on the designers screen may not appear the same to the client using a computer with a different type of screen or a user viewing from a tablet or smart phone. Color consistency has always been an issue for producers of physical products and for those working in the digital domain. Another point is that in digital design we try through the use of visual simulations (textures and pattern) to express the idea of the tactile experience of different physical surfaces.

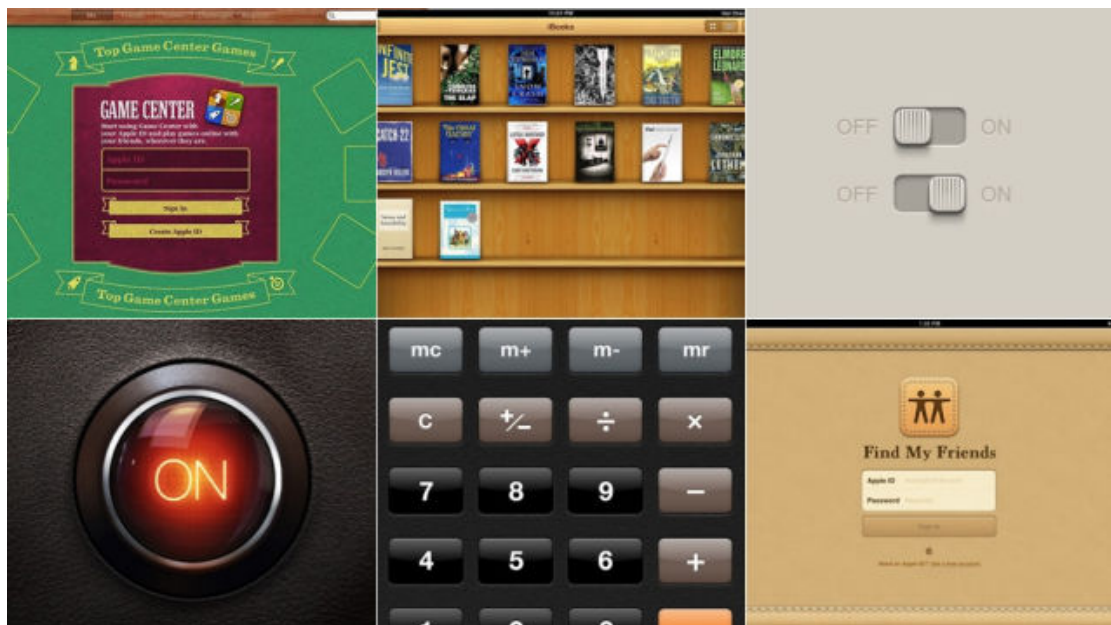
The main influences on designing digital environments are the fields of graphic design, user interface and user experience design. The requirements of enabling ease of reading from a screen instead of paper have instigated some of the most dramatic changes in typeface design in nearly 25 years.

3. What are the current and future trends in digital design?

Current:

Skeuomorphism vs Flat Design

The fight is still on between Skeuomorphism (Using images that replicate real world objects like wooden shelves in Apple's newsstand or the Apple iCalc with its leather stitched interface) and the use of flat design (where any three-dimensional elements have been stripped from the design) continues. Some feel that flat design can sometimes be harder to read or to interpret for users while Skeuomorphism gives clues in the way of prior real world experiences of how to interact with an application.



Another key trend is the increasing use of **animated or motion graphics** in the digital domain. Digital devices mean that an advert is no longer a static page telling the reader about a product. We increasingly see game like

advertisements, which encourage consumer interaction and therefore increase consumer exposure to brands. The use of animation in targeted emails to subscribers continues to yield unexpected and amusing solutions in an attempt to engage a public bored with junk mails. An animated Christmas email with a voucher thanking a client for their continued custom is bound to reap rewards.

The higher resolutions and larger screens of mobile devices when combined with improved bandwidth capacities have already seen a major shift towards the use of large images on our screens. Previously slow download times meant that including whole screen images was often seen as a design no-no and off putting to the consumer who would not want to wait to see a picture appear or pay for the bandwidth consumed.

Future:

Color in digital design is strongly influenced by graphic design trends. Pantone and Fashion do much to dictate our color palettes although currently the pastel hues of Serenity Blue and Rose Quartz have made little impact as they are not strong enough to be used as text options and are high in luminance so not great as backgrounds to read against.

The next trend towards the richer color palettes of the late 60's and early 70's this coming autumn will probably see a greater uptake than the current colors of the year.

The emergence of the 'crafted' trend in graphic design is leading to greater attention being taken to little details that effect user experience these will have big effects on digital design. How few actions must a user take to complete a task and how invisible (intuitive) are these actions in the consciousness of the consumer. Minimalism in user process will be very important in the near future (we'd rather scroll than click).

Graphic design has over the last couple of years seen a big resurgence in the field of traditional illustration and I expect to see signs of this appearing more within the digital realm. A lot of effort is being put into bringing the 'brushstrokes' back into digital illustration. I suspect you will see two distinct camps arising those who focus on building a craft-orientated humanized experience for the user and those focused on a slick minimalistic digital landscape.

Digital devices mean that graphic designers have moved from thinking about images, typefaces and color palettes to having to consider motion graphics, sound, voice and user behavior. Designs have to reflect a brand within the new experiential dimensions provided by digital devices.

4. How do you see the future of CMF (color, material and finish design) design?

I ethically find this question quite difficult. Products whether digital or physical fall into two groups; objects of desire or

need. As a designer I understand the interaction of CMF in the design of products, and appreciate that they add enormously to my experience of the products I take into my life. However at the same time I have to admit that digital objects tend to revolve around the first group, Objects of desire. I would hope that with the emerging development of digital devices by Medical technology companies with the aim of dealing with client diagnosis and customer service in the absence of sufficient attending staff, that I may feel less conflicted about the indulgence that is ultimately just a portable entertainment and communication device.

5. How do you see the position and prospects of digital color design in the future? Where do you think this field of design is evolving?

Good question! With the ever-expanding capacity of digital devices I would hope that color fidelity should become more attainable with time. Digital color is having a profound effect on the way we now think of color in terms of brand. More and more graphic designers are living in a uniquely RGB rather than CMYK world. Consumers are much more likely to come into contact with a brand through social media or a website than through print these days so digital color will most definitely have a big effect on corporate identity and the color world of advertising and marketing.

The big question is what will we be reacting towards next. In the 1990's we were bright, brash and cluttered in the digital environment, in the 2000's we were textured and skeuomorphic, in the 2010's we have gone flat and minimalistic. We are already seeing signs of designers trying to humanize, simplify and soften the user's experience, I suspect we will see signs of nostalgia and retro references creeping back in very soon.

Other things to note: Mobile control of home appliances is already well underway (heating, lighting systems, smart fridges) but as the uptake of 3D goggle technologies and body scanning sensors in homes increase and the use of 'media' walls in homes become more common changing your décor for a party or going virtual clothes shopping where you see yourself in the garment are not beyond the realms of imagination.

WHAT IS TREND?

Trend is a change that evolves over time.
It can be defined by driving forces and consequences.

TREND RESEARCH INSTRUCTION

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WHAT IS A TREND

MEGATREND

• 10-50 YEARS

SOSIO-CULTURAL TREND

• 5-10 YEARS

CONSUMER TREND

• 2-5 YEARS

BEHAVIORAL TREND

• MONTH - 1 YEAR

SERVICES & PRODUCTS

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MEGATRENDS 10-50 YEARS

Megatrends are large social, economic, political, environmental or technological changes. They are the big underlying forces that drive other trends.

SOSIO-CULTURAL TREND 5-10 YEARS

Socio-cultural trends are culturally specific sociological tendencies, which modify the value system, the moral, the ways of thinking and behaving. Socio-cultural trends are way for individuals and society to adapt to megatrends.

CONSUMER TREND 2-5 YEARS

Consumer trends are changes in consumer lifestyle and broader consumption behavior that socio-cultural trends drive.

BEHAVIORAL TREND A MONTH -1 YEAR

New practices of consumption, services and technology usage.

SOLUTIONS & PRODUCTS

Solutions and products that enable or support the behaviors - these include design or technology examples of socio-cultural, consumer and behavioral trends.