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Perceived Quality of Car

Understanding the Customers' First Impression

Master's Thesis in Industrial Design Engineering

EMMA CARLSSON & REBECKA MATHIASSON

DEPARTMENT OF INDUSTRIAL MATERIAL SCIENCE

CHALMERS UNIVERSITY OF TECHNOLOGY

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EMMA CARLSSON

REBECKA MATHIASSON

EXAMINER: LARS-OLA BLIGÅRD

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EMMA CARLSSON & REBECKA MATHIASSON

Department of Industrial Material Science

Chalmers University of Technology SE-412 96

Gothenburg Sweden Telephone + 46 (0)31-772 1000

Cover: The visualisation of the guidelines in a concept proposal, found in section 6.2

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Abstract

The customers first impression of the perceived quality of the vehicle interior in a showroom is highly important since it affects the customers final choice of vehicle. This master thesis aims to answer the questions of what it is that affects the customers first impression of perceived quality the most when looking at the interior of a vehicle, and what makes the customers perceive the vehicle as a premium product. These questions are investigated from the perspective that the vehicle should be used for sharing.

Theoretical research was conducted on the fields of human perception to understand how first impressions are formed. Furthermore, the field of perceived quality and premium design was researched to gain knowledge about how to apply this within the project. Finally, the fields of car interior and car sharing were researched. To get more knowledge and perspectives to the research, interviews with experts from three different fields – premium design, illumination and material were conducted, and showrooms were visited for a market analysis. User studies with participants from the target group were carried out, and a poll was sent out to gain deeper insights regarding the target group's perception in terms of the research questions. The knowledge from all research were then analysed and resulted in guidelines and a concept proposal.

A total of eight guidelines were established. They covered aspects such as aesthetic appearance, qualitative appearance, appeal to human senses, convey a message through the design etc. These guidelines were visualised in a concept proposal of a re-design of a car interior for a car developed by the company Lynk & Co.

Keywords: Perceived Quality, Premium Design, First Impression, Car Interior.

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Emma Carlsson

Rebecka Mathiasson

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Glossary

CEVT – China Euro Vehicle Technology

CMF – Colour Material Finish

LED – Light Emitting Diode

OLED – Organic Light Emitting Diode

PQ – Perceived Quality

IP – Instrument Panel

AC – Air Condition

1

Introduction

This chapter describes the background and purpose of the project along with a clarification of the research questions and delimitations. Also, societal, ethical and ecological aspects for the project are discussed as well as the process of the project.

1.1 Background

CEVT is an innovation centre within the Geely Group, that aims to be a frontrunner within the industry of automotive development and strive to find smarter solutions for mobility (CEVT, (a), n.d.). The passenger car development at CEVT includes the total architecture, powertrain and driveline as well as design and innovation. This master thesis will be performed for the Vehicle Integration Department with the Perceived Quality (PQ) team at CEVT, who are working with the visual experience and the perceived quality of the car. Perceived quality includes setting requirements for the geometry & appearance, material quality, illumination and paint & surface finish of the vehicle.

The car industry is changing and CEVT is working towards being "a world leading innovation centre, creating mobility solutions for a different tomorrow". This is achieved through innovations within software systems, virtual engineering and modular technology (CEVT, (b), n.d.). To strive towards the vision, it is crucial to understand and predict future users' expectations and behaviours. An important attribute that effects the user's expectations of a car is the PQ, it can be a determining factor for the user when choosing a car. However, how users perceive a car is highly individual and it is challenging for the designers to find attributes that appeals to everyone within a user group.

Lynk & Co is one of the brands within the Geely group and their model 01 will be evaluated during this project. Lynk & Co believes that the world does not need another car brand but a different one, by changing the experience and access to mobility solutions where one has the freedom to share, buy or subscribe (Lynk & Co, n.d). The chief executive officer Alain Visser states in an interview with Forbes that "…you don't buy a car, you subscribe to driving," with Lynk & Co (Banks, 2019). Furthermore, stating that Lynk & Co is a lifestyle brand rather than another car brand, offering leasing instead of promoting ownership. The leasing model is similar to today's available streaming services such as Netflix, a monthly charge with few commitments. The lifestyle vibe follows through to the stores as well, where there will only be one car on display, combining the space with events and different partnerships. A membership also includes invitations to happenings such as bar openings, events and music festivals. On the Instagram of Lynk & Co their services are described as a smartphone on wheels to meet the new needs of the market. On the website it is stated to belong to the generation which favour

sharing rather than owning material items (Lynk & Co, n.d). Moreover, that the offered mobility solution adapts to the user, not the other way around. A revolution of the car industry.

The focus of this project is to understand the objectives of the user's choice of car based on first impression of its visual appearance for the target group of Lynk & Co 01 – young urbanites, which includes people who lives in the city's, stays connected and enjoys technology. Furthermore, a concept that concludes the results will be designed.

1.1.1 Evaluating cars as a customer

According to V-count (2018), the usual procedure is to visit two to three showrooms before deciding what car to purchase. About 60 % of the people who purchases are undecided about what car to buy in the beginning of the shopping journey. However, car shoppers have more knowledge nowadays than ever before (Cole, 2016). The reason for this is because of all the information that is available on the internet. It is therefore important for car brands to have a good reputation on for instance social media and peer review sites. That the car dealerships share video content of the vehicles has been an exploding trend in the recent years, and it is a great way for the car shoppers to easily gain knowledge about the vehicles on the market. It also makes it possible for the dealers to present information about features such as colours, interiors and performance in a way that is more fun for the purchasers.

Solis (2019) writes in Forbes that the average time a customer visits a showroom is two times, because people start their shopping research online. Since people have gathered more information through the internet before they visit the showrooms, the customers' journeys and what they require from the car dealers have changed. Car dealers need to keep up with this development. ParkPlace implemented an online journey experience which makes it possible for the purchasers to finish 80% of the shopping journey online. The result showed that the customers went from the online site to the dealership and purchases went up with 23 %.

Customers' purchase journeys have changed over the recent years and their intents when visiting showrooms are no longer the same as they used to be. To be able to compete on the market, it is important to understand the customers behaviours and accommodate them.

1.2 Purpose

The purpose of this master thesis is to investigate which attributes in the interior of a car that affects the users first impression of it. Furthermore, there will be focus on what makes an attribute being perceived as high quality and premium in the car interior. The final deliverables will be guidelines and an implementation of these in a visualisation of a concept proposal for the re-design of the Lynk & Co 01 interior.

1.3 Delimitations

The project work will be limited to the appearance of car interior, which includes illumination, geometry & appearance and material quality. The exterior will be excluded from the study.

The perception of a light source depends on the illumination of its surroundings, which varies with time and location. Due to this, the study will exclude to evaluate the perceived quality of the car interior in night light. The study is also limited to the first impression of the car in showroom.

1.4 Clarification of the question

To fulfil the purpose of the project, the research questions are as follows.

- *What does the users look for when entering a vehicle?*
- *What are key factors for the users when choosing a vehicle for car sharing, fleet service or taxi usage?*
- *Which areas contributes more to the quality impression and are more important than others?*
- *What are key factors for the users to perceive the car as premium?*

1.5 Project process

The project process was divided into five phases where the results from each phase worked as a starting point for the next one. The phases were theoretical research, market analysis, user studies, development of guidelines and concept development which all result in the final deliverables, see figure 1 for illustration. Accordingly, the project report follows the same structure but with an added discussion and conclusion at the end where further steps to possibly take are considered. The theoretical research included a literature study regarding the human perception, perceived quality, premium design, car interior and car sharing. The research provided good insight and background information of the projects purpose and research questions, the results are found in chapter two starting at page seven.

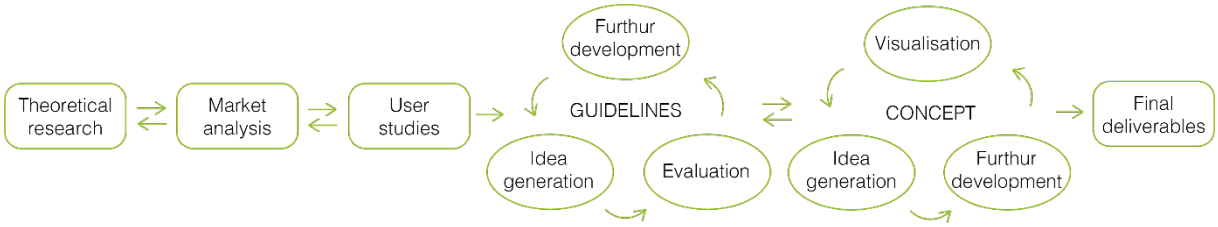

Figure 1. Visualisation of project process

Working with designing and producing vehicles means that there are enormous amounts of companies on the market to compete with. Knowing the competitors alternatives and where to place the own design is very important in order to create a product that can withstand the pressure from the alternative's that competitors can provide customers. For this reason, the market analysis was the next phase and conducted early in the process. It included a benchmark in order to understand current and upcoming trends within both premium design and mobility solutions. Furthermore, visits to showrooms and interviews with both car dealers and experts were conducted, read more about the results in section 3.2.1, 3.2.2 and 3.2.3. Professionals within the different areas of illumination, materials, premium design and car dealing were interviewed since their contributions to the analysis could complement and strengthen each other as well as serve as a base for the following phases of user studies, idea generating and concept development.

The knowledge gained from the professional designers during the interviews were used in the phase of user studies, which were carried out using two cars from two different brands, a Lynk & Co model 01 and an Audi e-tron. This in order to be able to compare the user's impressions and to identify possible similarities and deviations. The user studies consisted of observations, first impression journey mapping, ranking and interviews with potential users within the target group. When designing user studies, it is important to always assure a consent from the participants and to treat their contributions with care and awareness. A prerequisite is that the information collected about the participants in the user studies is treated in accordance with GDPR. All the participants were therefore, before the interviews and observations, provided with a consent form to sign where they were informed what the gathered information was going to be used for. The data gathered during the user studies were then analysed with various methods and the results lay the foundation for the concept development, which was the

following phase. It also included an evaluation and ended with a discussion and conclusion, the results are found in chapter four starting at page 27.

The development of guidelines and concept development phases were somewhat overlapping, the first one with the focus of establishing guidelines for the design of the car interior. The second one was about visualising the guidelines with a concept proposal. The establishment of guidelines was carried out by mapping the key insights from the theoretical research, market analysis and user studies. Different areas of interest for the guidelines to cover emerged and these were evaluated with a total of 27 participants through a poll. The results were analysed, and modifications were made before finalising eight guidelines. The concept proposals were based on the guidelines and initiated with an idea generating session using different ideating methods, read more in chapter five starting at page 38. After discussion and analysis, a final concept proposal was created for the interior of the model Lynk & Co 01, visualised in chapter six at page 52.

2

Theoretical Research

This chapter presents relevant research and knowledge required for the thesis project. The theoretical framework is divided into five sections, including the theory behind human perception, the definition of and research within perceived quality and premium design. Moreover, different attributes in the car's interior such as illumination, geometry & appearance and material quality are presented. Finally, the concept of car sharing is presented. The theoretical research that was conducted provided a broad base of knowledge which later contributed to the design of user tests as well as the design of the final deliverables.

2.1 Human Perception

The human sensory organs provide the brain with information regarding the surroundings, the information is interpreted and processed by matching the presence with events from the past (Lindsay & Norman, 2013). The data from the sensory system are processed and translated into perceptual experience. The human perception is referred to as the interpretation, organization and classification of the arriving sensory information.

2.1.1 Visual Appearance

Reinecke et al. (2013) state that colourfulness and visual complexity are two important attributes for evaluating the perceived visual appeal. Colour is one of the attributes used to elicit emotional reactions. However, the researchers argue that the most important aspect in terms of visual appearance is the visual complexity, where a moderate level of complexity is advocated to achieve a high level of appeal.

Lindgaard, Fernandes, Dudek & Brown (2006) report that the visual appearance includes more than one dimension. The impression which leads to the decision to buy an artefact or service is based on both the cognitive and emotional judgement of the visual appearance. Nevertheless, it is concluded that it is the physiological judgement based on the emotional response to the visual appeal that forms the first impression, the cognitive judgement occurs after this. Moreover, Tractinsky, Cokhavi, Kirschenbaum & Sharfi (2006) argues that the visual appearance is one of the most important sources for first impression due to the affect aesthetics has on the human mind.

2.1.2 First Impression

Rule & Ambady (2018) define first impressions as the initial interpretation of thoughts regarding an object or a person. These thoughts are based on the information from the five senses; however, it is primarily collected from sight and sound. The information is then passed on to the amygdala, where it is filtered and processed. The amygdala is involved in the perception of emotion and affects the behaviour (Haloupek, 2020). From here, the information moves on to the cortex, which is where meaning forms (Rule & Ambady, 2018). Finally, the information is fully processed in the frontal and prefrontal cortices to reach the conscious part of the mind, and an impression is formed.

Lindgaard et al. (2006) suggests that the initial impression based on the visual appearance of an artefact may affect the users subsequent experience. This is referred to as the *halo effect* in marketing research, the effect over time were the first impression is influencing the further evaluation of the products functions and attributes. The same phenomena are associated within human cognition as *confirmation bias* – solemnly searching for corroborating evidence supporting the initial perception and ignoring that which contradicts. This could be either to ignore the negative concerns by focusing on the positive aspects alone due to an initial positive impression, or focusing on the negative aspects since this was the initial impression and overlook the positive features.

2.2 Perceived Quality

Quality is a complex term with more than one definition and used within multiple fields. Garvin (1984) presents five different major approaches of defining quality; transcendent, product-based, user-based, manufacturing-based and value-based. The first one is found within philosophy where quality is equated with innate excellence – uncompromising standards and high achievement. The product-based approach view quality as something measurable and precise, the quality reflects the quantity of elements and attributes of a product. The definition of quality is perceived to lie in the eyes of the beholder within the user-based approach, recognizing individual needs and desires. The focus within the manufacturing-based approach is towards the engineering and manufacturing practice, referring to quality as conformance to requirements. The last approach, the value-based uses costs and prices to define quality.

However, Garvin (1984) states that all the above listed approaches have the same problem of being vague and imprecise in the explanation of product quality. Thus, presenting eight dimensions which can be used as a framework regarding the basic elements of quality. The dimensions are; performance, features, reliability, conformance, durability, serviceability, aesthetics and perceived quality. The perception of quality is equated with aesthetics, which is a subjective assessment.

Stylidis, Wickman & Söderberg (2015) describes perceived quality as two-sided when it comes to the automotive industry. Thus, proposing two definitions – *Value Based Perceived Quality (VPQ)* and *Technical Perceived Quality (TPQ).* Where the value-based definition refers to the whole customer experience of the product, including surrounding factors such as brand heritage via senses and cognition. The technical approach is all about the engineering perspective and the products technical aspects, fulfilment of requirements and the competitiveness.

Marcus Roffey (n.d) working with the design team at Tesla defines perceived quality as the customers impression of excellences regarding a brand, product or business formed through the human senses. Furthermore, that it is the customers perception of factors such as reliability, level of craftmanship, materials being used and attention to detail. This is not equal to actual reliability or robustness. The perception is derived from the subconscious thoughts and it is a matter of minutes or seconds. Roffey (n.d) provides an example of viewing a car in showroom for the first time, stating that the quality of it will be judged in a matter of a few moments by assessing the sensory input.

2.3 Premium Design

In 2013, McKinsey & Company performed an analysis to shed light on the development of users' needs in the Chinese premium car market (Gabardi, Huang, Sha, 2013, p. 5). The research suggests emergence of a new group of potential users of premium cars, who is referred to as "the new mainstream". This group is described to have confidence in that their incomes will continuously grow, which provides them the opportunity to consider buying premium cars. What differentiates the new mainstream group from the group of more affluent purchasers, is that the new mainstream places a higher value in brand, body style and exterior than the more affluent consumers who appears to have a higher focus in vehicle performance and power train (Gabardi, Huang, Sha, 2013, p. 6). The leading automakers embrace the new mainstream as potential customers and the market of premium cars has grown and become more competitive. Therefore, designing cars that aligns with the values of these customers is highly important in order to compete for market shares (Gabardi, Huang, Sha, 2013, p. 7).

Roffey (n.d.) writes about hallmarks of premium design. One hallmark is that premium products are made of premium materials. Apart from being made of premium materials, it must be obvious that the materials are genuine. A metallic should shine and feel cold like an authentic metallic, just like a leather part should feel soft. It is very important to succeed with this to reach a high level of premium, a poor paint finish on a metallic would make it appear less premium and the same goes for a wood veneer with too much gloss and curvature or a leather with excessive grain.

Other hallmarks mentioned by Roffey (n.d) are simplicity and elegance in lines and clean careful details to make a product look calm and ordered. A calm and ordered look makes it more likely to not detract from the materials and their high level of premium becomes more obvious. Also, that the product is an obvious craftmanship to which someone has applicated skill and craft to create, is a hallmark of premium design. In the old days, craftmanship most often referred to the way the product was manufactured but today, in the days of mass manufacturing, it equally applies to the design and engineering part in the development process. Furthermore, Roffey (n.d) also writes that a good philosophy to consider for reaching timeless, high quality premium designs is to strive to create a design where there is nothing left to remove.

2.4 Car Interior Design

Historically, the design of cars exteriors has dominated within the automotive industry (2018, Recticel). However, the market has changed radically due to the technological development, transforming the possibilities for the interior. It is now key to have a quality feel and aesthetic visual appearance of the interior, since these have a significant role in the decision to buy a car. It won't stop here according to the report from Recticel (2018), the interiors differentiating role is expected to increase further due to the introduction of autonomous driving.

The interior of a car is complex consisting of several various components with different designs and purposes, which need to come together into one car. The different areas within Perceived Quality at the Vehicle Integration Department at CEVT are elaborated in this section. It includes illumination, geometry & appearance and material quality. Paint & surface finish, which is also an area that belongs to PQ, was however excluded since it is mainly focused on the exterior of the car.

2.4.1 Illumination

Light is a tool that can be used for many functions. It can provide guidance, protection, comfort and serve as an interaction tool human-human and human-machine. Isele, Neumann & Blankenbach (2018) states that car's interior lightning is of great importance for the users first impression of the car, since the ambient interior light have the power to evoke both positive and negative emotions. Meaning that the interior light has the potential to function as an important selling point, since it can be used to create a unique atmosphere and lightning experience within the car. Furthermore, in the 11th edition of the *International Symposium on Automotive Lightning* (2015) light is described as a key factor that enables individualization of the interior environment. The presented research indicates that the colour of the light affects the level of comfort as well as emotions, thus resulting in the possibility to use colours to customize the interior based on the user's state of mind and desires. Moreover, research indicates that colour affects the user's possibility to use different colour customization to the interior based on their state of mind and desires.

Also, Wenzl (2017) states in an interview with *Automotive Industries* that ambient lighting provides the user the opportunity to customize and select personal favourites of the colour of the interior light. Furthermore, suggesting that in the future it could become possible to bring personal light settings between different cars, which aligns with the trend of car sharing. It is also stated in the interview that miniaturization is where the trends within LEDs are heading towards. Neureuther (2017) explains that the smaller the component is, the greater the flexibility and versatility becomes as for how it can be incorporated in a product. The miniaturization trend can enable smaller depths for mounting the LEDs and their smaller optics can reduce the overall costs.

2.4.2 Geometry & Appearance

There are aesthetical demands on vehicles for the fit and alignment between different surfaces, which affects split line positioning and geometrical variations. Gap and flush measurements are often used to review this on vehicles, and it all comes down to how the visual appearance is perceived by the users.

Every product that is manufactured, is affected by geometrical variations (Colosimo & Senin, 2010). This can cause uncertainty for whether the final product can meet its requirements for function, assembly and appearance, which all affects the quality. It is known that it is key to attain knowledge regarding the products geometric variations in order to be competitive on the market due to the high competitiveness. Since the units that are produced have variations, tolerances are defined to determine how large the deviations from the nominal value are allowed to be. This is an important step of the product development and it is all about finding the right balance between what passes the quality inspection, what is achievable in the manufacturing process and still fulfils the functional performance of the product.

Geometrical tolerances have been initiated to reach a more extensive way of defining variations (Colosimo & Senin, 2010). Providing the possibility to capture a larger spectre of variations such as position, shape and orientation of the geometrical characteristics compared to the more traditional dimensional tolerances. Leading to a more sufficient way to control the allowable variability of a products geometry.

2.4.3 Material Quality

There has been an evolution within the car industry over the past decades were the focus on safety, convenience, comfort, driving experience and quality have increased (Recticel, 2018). Aesthetics and tactile pleasures which only were seen in luxury cars are now standard within the industry. The technology development derives other prerequisites for the materials of the car interior, e.g. the capacity to absorb sounds to increase the comfort and enable a more safe and relaxed driving environment. Furthermore, the weight of the material is key when striving towards reducing the emissions and fuel consumption. There is also a rising demand for materials which are more sustainable and recyclable. All these needs to be fulfilled without compromising with the feel of being qualitative, luxury, durable and safe materials.

In a report from Recticel (2018) it is stated that the automotive suppliers face the challenge of developing new sustainable materials with high performance without affecting the quality of it or the cost. The materials of the vehicle are tested in multiple ways before going to production to make sure that they meet the standards and legal requirements. Nevertheless, it is stated that the majority of the interior components are made from materials which can be harmful to humans' health due to chemicals being emitted from the material surface into the air. These materials include hard plastics, leathers, fabrics, rubbers and elastomers, which are all commonly used in the car interior.

In the past, plastic and textiles were commonly used in the car interior, while leather was mostly seen in premium brands (Recticel, 2018). However, the development within the textile industry is evolving, thus making the gap between polymers and leathers smaller. Plastic is favoured for the interior due to its properties to easily and precisely mould various shapes. Moreover, there

are lots of new materials entering the market. The concept car ID. ROOMZZ 01 presented by Volkswagen (2019) is equipped with ecologically sustainable materials where the seats are made of so called *AppleSkin.* Which have the technical properties as artificial leather, and it is made of residual from the production of apple juice. Volvo is presenting their new XC40 Recharge where all the interior carpeting is made from recycled plastic, and their ambition is to use 25 % recycled plastic by 2025 in all the models (Volvo Cars, n.d).

2.5 Car Sharing

A definition of carsharing is that it is a system which allows people to use a car at any time and for any duration (Frenken, 2015 in Münzel, Boon, Frenken, Blomme and van der Linden, 2020). Further, it is described to exploit underutilized assets through replacing the concept of access through owning, to access without owning (Botsman & Rogers 2010; Rifkin 2000 in Münzel, Boon, Frenken, Blomme and van der Linden, 2020). It can create opportunities to meet the needs of individual transportation in a way that is more sustainable compared to a system where every individual is owning their own car. Apart from positive environmental impacts, it is also argued by advocates for collaborative consumption that it may have a positive impact for the social interaction established through the sharing communities that are required for this type of service (Botsman & Rogers, 2010; McLaren and Agyeman, 2015 in Münzel, Boon, Frenken, Blomme and van der Linden, 2020).

Studies shows that it is often well-educated young people with high income living in urban areas who use the different mobility solutions available on the market (Dias, Lavieri, Garikapati, Astroza, Pendyala & Bhat, 2017). Furthermore, stating that this might be due to being more aware of its availability and their familiarity with the usage of technology to leverage these services. In comparison to elderly, who are less likely to use mobility services due to probably not being as adapted to the usage of new services derived from technology. There are also correlations between using car sharing mobility services and smartphone usage, assumingly since smartphones often is key to access these types of services in the first place.

2.6 Conclusion theoretical research

Altogether, five different areas were researched; human perception, perceived quality, premium design, car interior and car sharing. As for human perception, visual complexity appeared to be a crucial aspect to consider for future work. It was also clear that a moderate level of visual complexity is preferable. Several hallmarks were found relevant for premium design, simplicity, elegance in lines and clean careful details are important to make a product appear calm and order. Illumination, material quality, geometry & appearance are all included in the perceived quality of the car interior and were researched furthered in relation to the identified hallmarks.

3

Market analysis

Market research was conducted to get an understanding of what is available on today's market, along with insights regarding upcoming trends within the car industry and adjacent sub-areas along with the field of premium design. As the theoretical research, the market analysis was an important part for gathering knowledge that later contributed to the design of user test and final deliverables. It was also conducted to gain knowledge from more sources, which in many aspects supported and strengthened the results from the theoretical research.

3.1 Methods

A benchmark with competitors and interviews with both car dealers and professional designers were made to collect relevant information to analyse the market and its trends.

3.1.1 Benchmark

Performing a benchmark consists of collecting, comparing, evaluating and learning from other good examples within the industry (Thylefors, 2015, Chapter 2). It is performed to make own improvement based on knowledge gained about other companies' solutions.

A benchmark was therefore conducted, also in order to investigate current trends as well as to gain insights about where future trends are heading. To gather this information, internet research was made, and car dealers' showrooms were visited. The brands that were analysed during the visits to the car dealerships were Mercedes Benz, Audi, BMW, Volvo and Mini Cooper.

3.1.2 Interviews

Interviews as a method provides insights regarding people's experiences, values, opinions and understanding of the reasoning process (Osvalder, Rose & Karlsson, 2015, Chapter 9). The method provides subjective and primarily qualitative data. However, it can also yield quantitative data depending on the templates structure. There are three different types of structures; unstructured, semi-structured and structured. A semi-structured template was used for both the interviews with the car dealers and professional designers, which includes a predefined structure with room for the interviewee to choose the order of the questions and ask supplementary questions. Interviews with car dealers were carried out to attain insights about customer behaviours for first impression of a car in showroom along with consumer behaviour trends. Moreover, interviews with experts were conducted to gain knowledge of designing different attributes as well as trends within relevant fields for the project scope.

Car Dealers

Five different car dealers in Gothenburg were interviewed about their knowledge regarding customer preferences, see appendix 1 for interview template. The interviews were performed in connection with the benchmark with sales personal for the brands; Audi, Mini Cooper, BMW, Mercedes Benz and Volvo. The sales personal meets many customers every day and are therefore expected to have a lot of gathered knowledge about different customers preferences and behaviours. The conducted interviews were about 15-20 minutes long and took place at the showrooms in the sales personals offices.

Professional Designers

Five designers within three different fields were interviewed for their expertise and knowledge, all relevant for understanding the research area as well as providing insights for the user studies and concept development phase. There were one CMF designer working with premium design, two designers working with light and two material specialists, one with a focus on sustainable materials, see appendix 2 for interview templates for all five interviews. All three areas are of importance when designing for a first impression with a focus on perceived quality and premium. Four of the interviews were carried out in person and one over the phone, the duration of each interview was approximately one hour.

3.2 Results

The results from the market analysis consisting of a benchmark and interviews with both the car dealers and professional designers are compiled in this section.

3.2.1 Benchmark

The results from the benchmark are divided by identified trends within premium design and identified trends within transportation. Furthermore, the results from the observations from the car dealers' showroom are presented.

Trends within premium design

According to Chen (2018), differentiation and uniqueness are nowadays significant factors for premium design. He also states that well-being is becoming more and more important for consumers. Wellness is considered a megatrend, which is a trend that is identified to continue its journey over the upcoming five to ten years. People are more aware and keen to make healthy lifestyle choices, which can concern everything from eating habits to activities and thoughts. This provides new opportunities for companies to design products that appeal to the target group. The trend steers the way towards creating products that can promote and enhance wellbeing, for instance contribute to stress reduction and meet customers quest for convenience through designs that simplifies and automates to ease life and free time for users. Other examples of products that are designed to enhance wellbeing are copper-infused sheets that can fight bacteria or hotels rooms with fine-tuned lighting and sound systems.

Also, ethical living is becoming a more significant trend in society and people are more willing to pay premium for those products that provides this, according to Chen (2018). Living in harmony with the environment and human rights requires awareness from customers which puts higher pressure on companies regarding their levels of transparency and sustainability. For products this implies designing them for longevity, repairability and multi-functionality. Visually this can be reflected with an appearance that implies simplicity and honesty.

Trends within mobility solution

There is a change within the car industry were the privately-owned traditional cars are challenged by various mobility solutions. McKinsey (n.d) equates the change with the shift from horse to car back in the days. The prediction is a future with connected and autonomous mobility solutions that are more productive, safer and environmentally friendly. BMWs (2020) prediction are in line with McKinsey's, formulated in three trends with electrical vehicles, autonomous driving and car sharing.

There are both a lot of different car sharing companies on the market as well as those who redefine the car itself and presents new concepts. Canoo (n.d) is a company which have come up with something different, a loft on wheels without commitment and hassle-free. Moving from the traditional ownership towards a flexible membership with monthly payments, no

commitments and availability 24/7. A mobility service offered in cities are pod-taxis, Bzzt (n.d) are one of them and offers short distance travels in the city using ecolabel electricity driven pods. There are also services which let people rent out their car to people nearby for financial compensation, NEVS (n.d) launched their service *Car Sharing by NEVS* in a suburb close to Stockholm. The service enables private car sharing where the owner choses the price and availability themselves and a neighbour can rent whenever and for how long it suits them.

Showroom visits

The cars were all displayed in the same way in the showrooms for the five brands. Most of the cars were lined up with some distance between so that the customer can move freely around the cars when entering and opening the doors, trunk and hood. Some cars had the hood open to display the motor. All of them had the power on, thus letting the viewer experience the lights, sounds and haptic feedback when integrating with the car as well as the visual appearance of the display and dashboard.

The change from small displays and analogue instruments to one large display is a clear trend seen over all the car models of the visited brands. There are however some differences when it comes to the exterior colours. Audi and Volvo had more subtle colours while Mini Cooper and BMW had brighter and more colourful choices. Mercedes Benz presented mostly subtle colours but had one or two which were more colourful. Dark colours seem to be the most common colour when it comes to the interior, there were only one or two cars at each showroom with a light-coloured interior.

3.2.2 Car dealers' interviews

The prerequisites have changed for sales in showroom according to the interviewed car dealers, historically a customer have been visiting the showroom several times and the car dealers had another sales approach. Today the customer is prepared and have already put together their dream car online prior to the visit. Their number of visits are below two and the questions are more specific, thus raising the demands on the sales personal. Today's showroom visits are more about experiencing the car in real life, evaluate the comfort and demo drive.

A dark interior is most common amongst a younger clientele and families, it is perceived as more practical and better looking. A lighter interior is more common amongst elderly. Colours on both the interior and exterior is highlighted by the car dealers as important factors in the choice of car for the customers. The choice is also affected by different offers and package deals, due to the desire of getting as much car as possible for the least amount of money.

The amount of space, storage possibilities, heater and towbar are commonly asked questions and important parameters when choosing to buy a car in Sweden. The material and colours of the interior and exterior are the most common add-ons along with other aesthetical features when buying a car. Furthermore, there is a correlation between the price tag of the car and the number of add-ons and customization. The higher the price, the more add-ons, which means that the customers who purchased the most expensive cars are also more likely to spend more money on add-ons.

3.2.3 Professional designers' interviews

The results from each of the five interviews with the experts are concluded in this section. Each interview identifies the process used for designing within each field, in combination with detailed knowledge of the focused area as well as the current and upcoming trends.

Light Designer

The light designer stated that light is not only a bearer of information, it can affect people's levels of cortisol and melatonin. The way the light is perceived depends on many different factors such as the colour of the light, its intensity and the surrounding environment. The eye is sensitive to movement such as blinking lights and brightness. How bright something is perceived, is however dependent on contrasts. When performing a task, it is especially important that the task light does not have too high contrasts. Moreover, dimmers can be used to reduce issues with contrasts.

When the light is aimed towards a surface such as the walls in a room, it will automatically be perceived to be larger. If the lights instead are directed away from the walls towards a specific area the room will be perceived to be smaller. Another very important factor to consider when designing lights, is how shadows emerge as well as to avoid creating glare. Furthermore, one should also consider how the light will affect the overall experience and be perceived by the receiver. For instance, being outside a night when the moon is small, the sky cloudy and only a few streetlights lit will be perceived as very dark for the eyes. Compared to the same scenery but having full moon, a clear sky with bright stars, snow on the ground and streetlights will be perceived as much brighter for the eyes.

Features that are shiny are often perceived as more premium and attracts attention since they resemble expensive things like polished surfaces, glimmering oceans and shimmery metallics all over the world. Coloured lights are however used differently within different regions and cultures due to the variation in meaning of colours. This is seen in facade lightning of houses, were various colours are being used abroad and primarily white lights are used in Scandinavia. It is more accepted to use coloured lights in the car industry, which are now also trending in Scandinavia. Something to consider is how the coloured lights are used, there is a difference in appearance between having a coloured surface and white light or uncoloured surface with a coloured light. It is perceived as more premium to use coloured lights rather than coloured surfaces.

There is an increased adaptation and steering of the light depending on factors such as time of day and season. This type of utilization and smart steering of light is common within offices and hospitals. Moreover, the area of healthy lighting is increasing within the field of light in research – how light can be used to eliminate various types of health issues. Furthermore, the trends within lightning are coherent and not dependant on the type of product. Moreover, there is a merge between different segments, e.g. light experts from the theatres transfers to work with lightning in other fields such as urban environments, thus transferring influences from the film and theatre to city planning. One can also see that the LED units are getting both smaller and lighter, which result in other conditions for implementation. It is believed that LED is here

to stay for the next 7-10 years. While OLED is in the research pipeline and believed to be introduced first through experiments in premium cars. This due to the ability to integrate it into paper-thin surfaces, thus creating new conditions and opportunities.

Car Illumination Expert

The light design for a car is affected by the entire vehicle's architecture thus being a key factor when setting the dimensions early in the design process. Meaning how the light will be controlled e.g. voice, gesture or mechanical mechanism as well as the function and purpose for each light, its colour and intensity are established. This is later adapted and amend to fit the intended target group and market that the specific car model is aiming for. Furthermore, corrections are made to meet changes in the design and form language for both the interior and exterior since the light is critical in enhancing different form and material features of the vehicle.

The customer needs and expectations are in focus when it comes to designing lights for cars. The light should be both functional and aesthetic at the same time and the less amount of lights that can be used to fulfil the need the better. New technology innovations lead to new needs and expectations as well as changed prerequisites. For instance, the ability to unlock the car from a distance require new light features to communicate the action.

There is a lot of different parameters to take into consideration when working with the planning and design of the lights for the car interior. Poor light is unnatural, not there when expected and lacks connection to a need or expectation. It appears inconveniently, is too strong or weak, unbalanced and not in harmony in terms of character and quality. It is everything that is not in line with what humans' experiences as natural light. Good lightning goes by unnoticed, it just is. Furthermore, the car illumination expert states that the light design also needs to be in line with the brand vision and design strategy. An artificial blue light might be the right choice for a brand that is more technology focused while a brand focusing on safety and comfort will benefit from working with more natural inspired light to mediate those attributes.

Light has not been used with moderation historically. The trend has shifted towards optimization rather than wasting, especially for public environments and indoors where the amount of used light is of great importance from a sustainability perspective. Human centric and sustainability is the focus within the light area today, thus also within the automotive industry, especially the sustainability aspect. However, this is more important when it comes to other areas than the light, since it has a relatively low impact on the car's overall environmental impact. Human centric is trending, it is all about focusing on the human needs and the light plays a major role in this due to different factors. For instance, the melatonin production, the cortisol levels which can be triggered by too much light or flickering light and it also disrupts the natural relaxation of the body and mind which occur when the sun is setting.

There is a distinct difference in the visual effects and appearance of lights within the car between different cultures. For instance, premium light in China is cold and blue due to being perceived as clean and fresh. Whilst in Scandinavia a warmer and more natural light is preferred since it is perceived as safe, pleasant and more premium.

CMF Designer

What characterizes a premium product from a non-premium product is the quality of it, which makes quality management during the development process a key factor. It is even more important than the design itself. Furthermore, the premium products should lead the trends and the market. Instead of following the customers, the premium design should convince the customers to follow new trends.

The CMF designer, referred to as the premium designer, also stated that it seems like the trend of what defines premium and luxury is heading towards focusing on the story behind the product or the experience it will generate rather than the product itself. The design should aim to deliver a story and the brand philosophy. For instance, both Volvo and Nike emphasis the sustainability of the materials. As for the trends of the visual design there are not that much differences than from the recent past. The design should be minimal and stylish, fit into the environment and be toned down. A premium product can have a similar design language as older and classic products in some cases, but it is important that it always inhibits something new and qualitative in its design language. The Tesla Cyber Truck is an example of a product that offers something new, qualitative and modern according to the CMF designer. That makes it premium in that sense. The premium designer also stated that due to the internet, trends are more globalized, and it is possible to see overlapping of trends between cultures and regions in the world.

Generally, when it comes to the colour of premium products, they should in broad terms have less hue and saturation since more natural colours makes the product more premium in its appearance. This applies both to its surface finish and the light it emits. It should be perceived as harmonious and not noisy. However, the premium designer also stated that the colour choice should depend on the context of the product.

To understand what the customer needs, the premium designer stated that it is important to try to imagine being the customer and see things from the customers perspective. Try to visit the same stores, hotel lobbies etc. as the target group visits. Find out what other products they purchase and see what their taste is. When designing premium products, the designer said to not invite users in the design process. If 100 users would be included, they would still not represent the market. There will also always be miscommunication and misinterpretations. A preferable approach to design products that will fit the target group is to see a lot of use cases, build from experience and know trends. Use google data or reviewed data and search for numbers rather than comments about products to gain knowledge about customers experiences and opinions, big data is beneficial for user research.

Attribute leader of sustainable materials

When choosing materials for a vehicle, there are many factors to consider such as laws and regulations, costs, trends, health aspects, environmental impact, what environment the material will be exposed to, recycling, design etc. According to the attribute leader of sustainable materials, there are differences regarding the focus in sustainability in different parts of the world, which translates into what is considered good and bad materials. The interviewee stated that in Asia there is a bigger focus on human health and in Europe there is a bigger focus on the health of the planet.

The interviewee also stated that plastics used in vehicles can emit particles that are bad for human health since they are cancerogenic and it is important to find materials that does not have this effect. However, having leather as a substitute is not an optimal solution and the trends are heading towards vegan materials for cars. Many are working with textiles that are made of recycled plastics, which is also an upcoming trend according to the interviewee. There is, however, very varying quality of recycled plastics since the quality depends on how it has been recycled. For instance, chemical recycling creates a completely new material.

Design wise, coarser materials are used on the lower part of vehicles and finer materials on the upper part. However, a lot is currently happening regarding the trends of the composition of material in vehicles. For instance, car brands that are not as expensive and not considered as premium, use exterior paint in the interior as well. Things are starting to mix up and turn around, therefore textiles on dashboards can be seen in cars nowadays. Apart from this, modularity, which can be compared to other products like chairs that can be reupholstered, is becoming trendier. Generally, the trends are the same when comparing materials in the car industry with other industries, for instance the fashion industry.

Attribute leader of materials

The process of choosing materials for the car's interior includes three key factors; the choice of material itself, the harmony of the interior and the execution of the material finish. The choice of material and the harmony is the focus for the project team, whereas the execution is up to the supplier. This means that the choice of supplier is extra important, since their work determines the surface finish of the final product. Material is an attribute with high demands in terms of quality, however, the material attribute leader states that it is often made compromises of the material choice due to reducing costs. When this happens, it becomes even more crucial to find the right harmony and the best execution to compensate for the cheaper and less qualitative material choice. Nevertheless, it is preferable to have as high qualitative material as possible to attain good harmony and execution. The material choice affects the customers impression of the car, including achieving a premium feeling, it is all dependent on making the right selection of material.

The interviewee states that there are some regional differences regarding the perception of premium materials. China is used as an example where there does not seem to be any difference in the perceived quality between using leather or vinyl on the seats, unlike Europe where leather is favoured. Furthermore, it is preferable to paint components made of plastic to attain a more qualitative feeling with the somewhat more matte surface finish. Using the material alcantara for instance in the ceiling, is considered to contribute to a more premium feeling. Chrome-

details are very popular within the car interior and comes in different levels of executions according to the material attribute leader. It becomes more premium by using aluminium as a base, this is distinguished by the cold feeling one gets by touching it compared to having a plastic base with a chrome coating.

The interviewee underlines the importance of creating a consistency throughout the interior, making sure that all the materials have the same surface finish, embossing and colour. Furthermore, establishing an even distribution and coherent level of execution and harmony. A medium level of quality throughout the interior is preferred in comparison to having a few high qualitative components and then the majority being low quality.

The material attribute leader sees a trend moving towards more sustainable material choices, with a more minimalistic and natural feel to it. Using the living room as a reference for the shifting direction of the car interior, where textiles will be more commonly used throughout the car interior. Having a feeling of a couch for the seats and carpeted flooring rather than leather and rubber as today.

3.3 Conclusion market analysis

It was concluded from the benchmark that wellness and ethical living is becoming more and more significant which translates into design of premium products. This was supported by the car illumination expert who stated in the interview that human centric design is trending. Also, the CMF designer stated that the trends are heading towards more focus on the story behind products, which is often about sustainability. Another trend that is growing is car sharing which also is in line with increasing sustainability.

Both the car illumination expert and the CMF designer stated that for something to be perceived as premium, it should have a natural look. However, there are situations where more unnatural looks can fit into the environment or can be used to achieve certain effects. Further, the CMF designer states that premium designs should be minimal, stylish, toned down, harmonious, both on its own and in relation to its environment, and first and foremost be of high quality.

Also, the material expert emphasised that harmony is highly important to achieve when it comes to the visual appearance of the interior. Through speaking with several car dealers, it was also clear that the target group generally prefers darker colours on materials in the interior prior to lighter materials. The attribute leader of sustainable materials stated that a shift is occurring regarding what materials can be used where in the cars, the trends are deriving from how materials traditionally have been used. As well the material expert stated that the trends within how materials are used in vehicles are changing direction and are heading towards alternatives like carpeted flooring and more living room like styles.

4

User Studies

This chapter presents the methods of the user studies, which consists of empirical research in form of interviews and observations of the user's behaviour when experiencing a car for the first time. Moreover, are both the analysis and results from the different methods presented in this chapter. The user studies provided insights which determined the focus area when designing the final deliverables. They also revealed a lot of information about the target groups opinions which was used for the analysis.

4.1 Methods

As Gabardi, Huang & Sha (2013, p. 7) states, it is crucial to identify what future customers value, in order to compete for market shares. To gain knowledge about what is important to the users', user studies was carried out. Interviews with users were performed to identify their most explicit preferences. To also identify the values that were unspoken, observations of the user group's behaviours were conducted.

Empirical methods such as observations and interviews were used to investigate how people behave during the first impression of a car displayed in showroom. Both objective and subjective data were gathered. Objective data refers to direct measurements such as the number of times a person opens a door (Osvalder, Rose & Karlsson, 2015). Subjective data is the persons assessment and experience of a task or situation, their thoughts and feelings either verbally or in writing. Furthermore, both qualitative and quantitative results were collected to gather both numerical and expressional data.

A five-day long user study session was held with a total of 13 participants who were identified to be within the target group and potential future users of the type of vehicle that was the subject of this project. Due to confidentiality the participants were all employees at CEVT. The set up for the user study consisted of two cars, one Audi e-tron and one Lynk & Co model 01, that were parked next to each other inside a workshop. The participants in the study took part individually for 1,5 hours. During this time period, they were first provided with instructions about the plan for the study and asked to sign consent forms. The next step in the study was observations of how they interacted with Lynk & co 01 followed by their interaction with Audi e-tron. For both observations, the participants had been given a task which would reveal information about their first impressions of the cars. The observations were directly followed up with structured interviews. Once the user studies were finished, the gathered data were analysed with various methods.

4.1.1 Equipment – the vehicles

Two different car models were evaluated in the user studies, a Lynk & Co model 01 and an Audi e-tron. The 01 was chosen since it is a released and public model from Lynk & Co. The Audi e-tron was chosen for evaluation because of its categorization within the premium segment on the market. Since this project is focused around premium features the first impression of the Lynk & Co model was compared to the Audi e-tron. The two models are described in the following section.

Lynk & Co 01

01 is the first model presented by Lynk & Co and the first impressions of those who have experienced it are positive, the interior is described as modern and has a premium feel to it (Nedelea, 2018). The similarities with Volvo in terms of the form language and elements such as switches, steering wheel, gear shift and infotainment system are highlighted. Thus, linking the brands with one another and transferring the feeling of being well built from Volvo to Lynk & Co. Based on the first impression it is perceived as one of the best Chinese cars and in line with the cars offered by European brands.

In a review from Auto Express (Allan, 2019) the display is described as qualitative and the dashboard as Volvo-like minimalism and intuitive to operate. It leaves the impression of being classy and packed with features, however, the response time is mentioned to be a bit slower than the German rivals. See figure 2 for sketch of Lynk & Co 01.

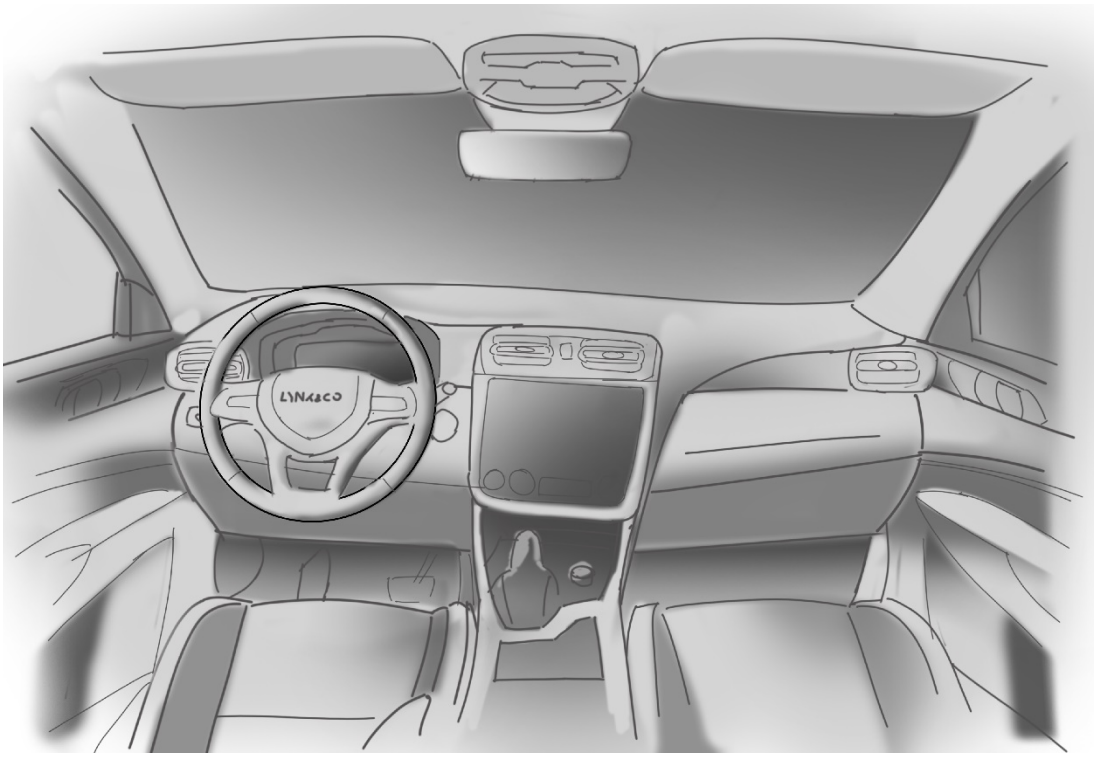

Figure 2. Illustration of Lynk & Co 01 interior

Audi e-tron

According to the CMF designer, Google data is very useful for creating a better understanding about how products are perceived. Typing a google search on “Audi e-tron review”, generates many hits and the ranking is almost always on four out of five stars in the search engine expect from on a few webpages that rates it a little higher and one a little lower.

The Audi e-tron, see sketch in figure 3, generally receives high scores in evaluations of its interior design. In Motor1.com (Turkus, 2019), it received eight out of ten points for its interior design. It is described as clean and minimalistic, which aligns with what the CMF designer described identified premium designs. What Car? (n.d.) writes that Audi is famous for the quality of the interior in their cars and the e-tron completely lives up to that reputation. They rank it with five out of five scores regarding the quality of the interior. Highlighted as contributors for the high scores are the visual wow-factor that the dual-touch screen provides, the tactilely soft plastic it is designed with, the highlights of chrome, glitzy trims and leather material.

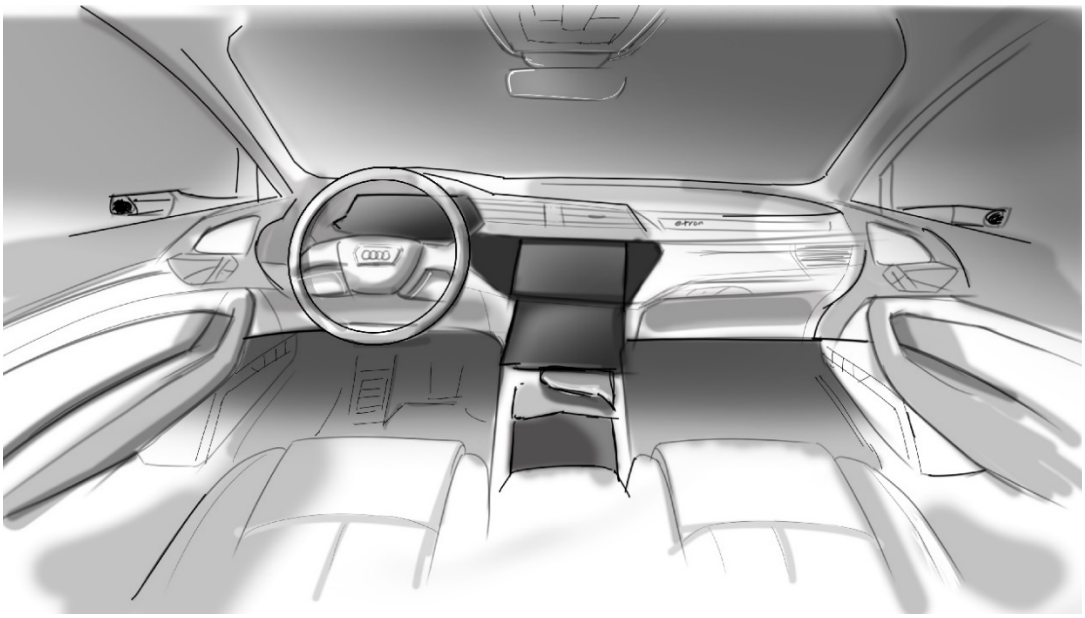

Figure 3. Illustration of Audi e-tron interior

4.1.2 Pilot study

A pilot study with one participant within the target group was conducted to evaluate the chosen methods and procedure of the user study. It was used to verify whether it would generate results as intended, if something was missing or needed clarification in order to run smoothly. The results from the pilot study were used to improve the procedure and method.

4.1.3 Observations

Observations is an objective method used to gain understanding and insights of a specific use situation without affecting or interrupting the ongoing process (Osvalder, Rose & Karlsson, 2015, Chapter 9). It provides the opportunity to obtain knowledge about behaviours that the user might be unaware about, insights regarding the actual actions of the user not only what is described with words.

The participants were observed during the user study in parallel with the interviews and tasks that they were asked to execute. Their behaviour and interaction with the cars as well as their comments were noted for later analysis. This in order to identify behavioural patterns or deviations between the two car models as well as the participants.

4.1.4 First impression mapping

The participants were asked to perform a task consisting of three steps to identify the first impression of the interior; what caught their attention, why so and if it was something positive or negative. Haptic, audible and visual impressions were all included in the study. As Stylidis, Wickman & Söderberg (2015) describes, perceived quality also includes surrounding factors such as brand heritage via senses and cognition, which is why also those were included in the study and documented during the user study sessions.

First, the participants were given blue post-it notes with a number one, two, three, four or five on it and asked to place them in the order of what caught their attention and gaze. Afterwards three green post-it notes were handed out with the incentive to place them on positive features. Last, they were given three orange post-it notes and asked to mark features which they perceived as negative. Afterwards a template was used to note the placement and reason for each of the post-it, see appendix 3. This in order to get insights about the thought process behind the first impression and why something caught their attention. Furthermore, the placement of the post-it notes where documented by photographing for later evaluation and visualization.

The blue post-it notes were translated into scores based on the number on each post-it for the analyzing phase. The post-it marked with number one, indicating first look were translated into a score of five. Post-it note number two was translated into a score of four, post-it number three got a score of three, post-it number four was replaced with a score of two and finally post-it number five got a score of one. Meaning that the attributes with high scores would be the one which caught the participants attention.

4.1.5 Ranking

Follow-up questions consisting of ranking the vehicles design attributes on a scale from one to ten were used after they had performed their given tasks, see appendix 4 for template. Five different attributes were used to capture the participants impressions of the vehicles. They were asked to rate how inviting and welcoming the interior was perceived, how innovative it was and how high the quality they viewed it to have. Furthermore, how balanced and matching it appeared, and finally how minimalistic and simplistic it was perceived to be. The reason for choosing these attributes was because it was what the premium designer described as characterizing and highly important for achieving designs of products that are perceived as premium.

4.1.6 Interviews

Structured interviews were conducted with the participants during the different stages of the user study, see appendix 4 for template. Initially, questions were asked about their first impression when interacting with the cars. Then concluding questions were asked at the end of the study to compare the participants impressions comparing the two models. The aim with these interviews were to complement the observations by capturing information that were unspoken during the tasks and get insights regarding their impressions.

4.1.7 KJ-analysis

The KJ-analysis method includes four steps; labelling, grouping the labels, creating charts and explanation, either verbally or in writing (Scupin, 1977). The labelling is performed by writing information from the data gathering methods on one card each, then the cards are categorized into groups and labelled with titles. The third step includes finding patterns within the groups and unify them into a chart. Lines and arrows are used to describe connections, contradictions, interdependence and relations within the chart. Finally, the chart is explained to reduce the complexity and present the data in a more manageable format, new ideas often occur during this step.

The KJ-analysis that was performed reflected the categories of the interview questions. The different categories in the KJ-analysis were therefore about first impression, innovation, quality, balance, simplicity and how inviting the vehicles where perceived. These categories were furthermore divided into Lynk & Co and Audi. The answers from the comparing interview question were gathered in two separate parts of the KJ-analysis, which involved colour, illumination and material as well as choice of vehicle and bothering design features for the two models.

4.2 Results

The results from the initial pilot study and the user studies consisting of interviews with users, mapping of their first impression and observations are compiled and visualized in this section.

4.2.1 Pilot study

As a result of the pilot test, a few changes were made to the user study. It was concluded that the participants should receive directions about all three different colours and meanings of the post-it notes that were used in the test before they started using any of them. This was changed to make it clearer that the blue should only capture what was first looked at in the vehicles and not opinions about any features. Thoughts about the different features and attributes in the vehicles would be delivered by the participants in the next step with the green and orange post-it notes. This clarification was made due to the importance of only capturing what attribute in the car catches the eye first, without adding an opinion about wheatear it is positive or negative from a design perspective.

Furthermore, it was decided that the post-it notes that were placed in the car would be documented and discussed together with the participants in a separate template afterwards, appendix 3. This would enhance the possibility to discuss the choices made by the participants and create a better understanding about their experiences and opinions.

Finally, many of the questions were changed from “yes” or “no” questions to letting the participant answer with a ranking system consisting of a scale from one to ten instead. This was done in order to create better possibilities for analysing the data and a more organised method for comparing the vehicles and their expressions.

4.2.2 First impression journey

From the observations of the participants interaction with the vehicles it was clear that all of them interacted with the vehicles from the driver's side initially, see figure 4. Some also entered the rear seat afterwards. Furthermore, when entering the vehicles, most of the participants placed their hands on the steering wheel at some point, as if they were testing how it would feel to drive the car. All the participants were sharing their thoughts while interacting and thoroughly investigating the vehicles.

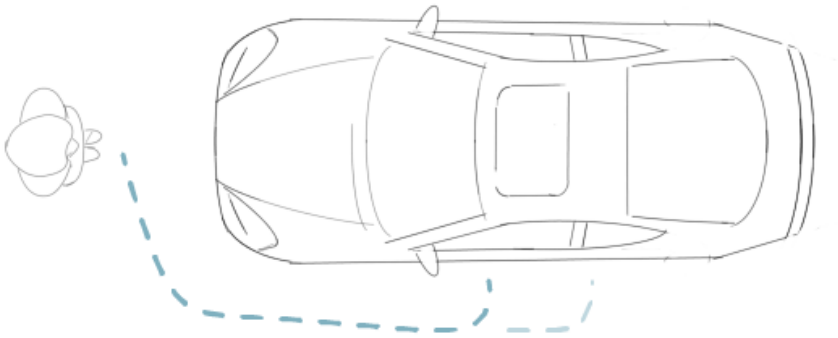

Figure 4. Illustration of interacting path

In the translation of the numbered blue post-it notes into scores, it was the steering wheel and infotainment system which most frequently caught the eye of participants with a total score of 35 and 34 for Lynk & Co 01. Followed by the driver's seat with a score of 29. These three features seem to be the main focus area for the first impression. Then there is the gearshift, centerstack, patterned trim-detail, dimmer and ingress with scores from 15 to 10, see appendix 5 for all the listed features. All these attributes are visual when entering the car from the driver door, which makes perfect sense since all participants interacted with the car like so, see figure 5 for visualisation of post-it.

When it comes to the green post-it representing what the participants liked and found positive there is some similarities with the first impression. The infotainment system received eight green post-it notes followed by the drivers' seat with six, the steering wheel with five and the dimmer with four for the Lynk & Co 01. All of them were also given blue post-its during the first impression task. For the orange post-it, representing negative attributes the trim-detail were given six post-its followed by AC components with a total of 5 post-it notes and both the seats and infotainment system with three post-it notes each.

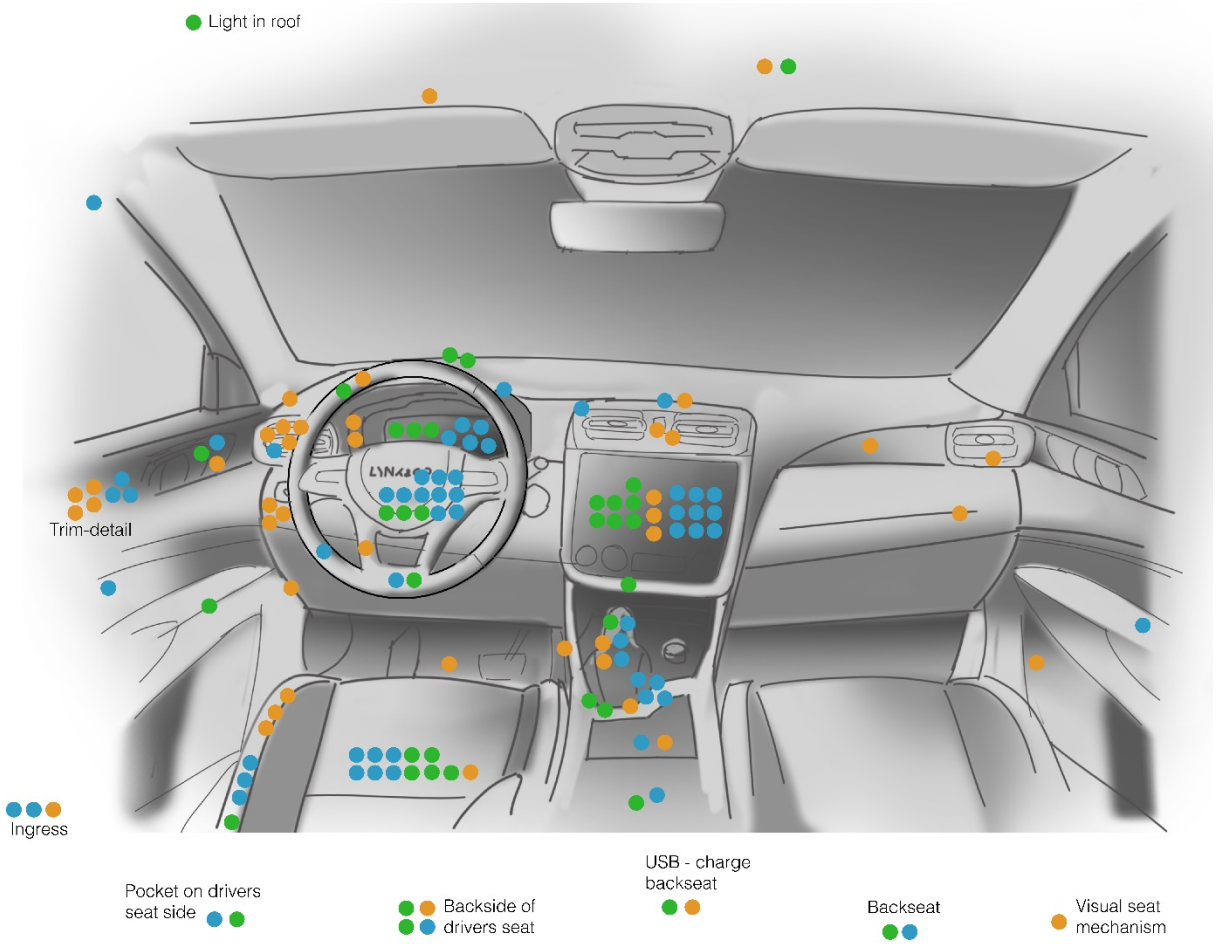

Figure 5. First impression visualisation Lynk & Co 01

For Audi e-tron the camera display for the side mirrors are outstanding with its score of 44 and 11 out of 13 participants placed a blue post-it on this component. Followed by the steering wheel and infotainment system with scores of 25 respectively 24, see appendix 6 for all the listed features. This somewhat correlates with the results from Lynk & Co 01, if the side mirror is overseen, the steering wheel and infotainment system are ranked highest in both cases. It was the first interaction with this type of side mirror for most of the participants, which probably is the reason for attracting a lot of attention. Then the e-tron light projection on the ground along with gearshift, dimmer and drivers' seat were given scores between 16 and 11. Furthermore, if the scores from all the different ambient light features are combined it has a total score of 11, see figure 6 for visualisation of post-it.

The ambient lights were given a total of seven green post-it notes representing the attributes found positive with the interior. Followed by the infotainment system with five post-its and both the side mirror camera display and dimmer were given three post-its each. All of these were highlighted with blue post-it's for the first impression. For the orange post-it representing negative attributes it is quite even and rather low number of post-its per feature. The hole in the centerstack were given four post-it notes, then the gearshift, driver's seat, high gloss piano lack finish and steering wheel were all given three post-its. When it comes to the infotainment system there is some variations in reasons and placement. Three post-it notes are placed here

for the reason of being a dual-display, two post-it notes are placed on the lower display and two post-its are given to the whole infotainment system. Summing up to a total of seven orange post-its placed on the infotainment system.

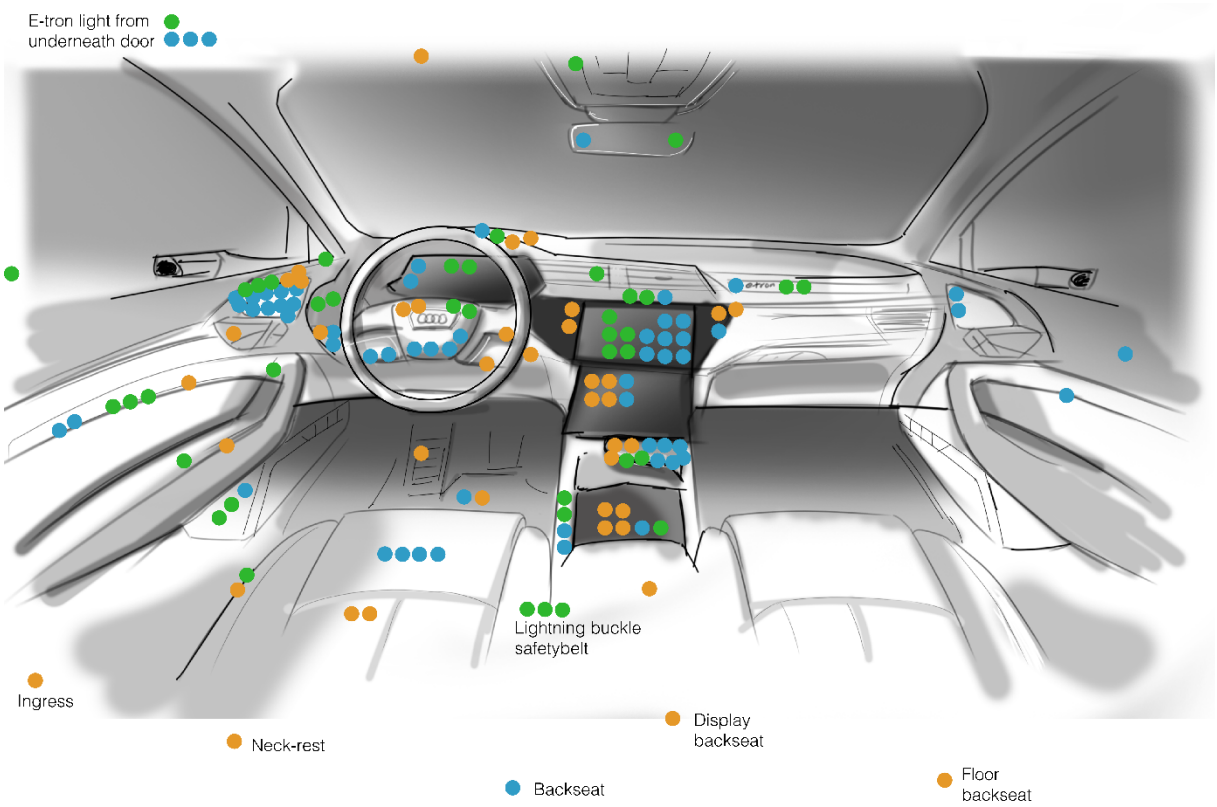

Figure 6. First impression visualisation Audi e-tron

4.2.3 Ranking

Audi e-tron received higher scores in all the tables; total, average and median in comparison to Lynk & Co 01 for all five attributes as visualized in figure 7. The attribute with highest differences is innovative were Lynk & Co have a total score of 54,5 out of 130 when the all of the 13 participants score were added to a total. The average was 4,2 out of 10 and the median 5. Whereas Audi received a total of 101 out of 130, average of 7,8 out of 10 and median of 8. The total score and average show the biggest differences, were Audi's score is almost twice as much as Lynk & Co. Meaning that the level of perceived innovativeness of the Audi e-tron is twice as high compared to Lynk & Co 01 based on the ranking.

Most of the ranked attributes are quite even between their average score and median. However, quality is slightly off for Audi with an average of 7,9 but a median of 9, this is due to one score of 3, one of 5 and one of 7 whilst the rest is either an 8 or 9. For Lynk & Co the simplistic & minimalistic is slightly off with median of 6 and an average of 4,9, the scores range from 0 to 8 being highly variating. Which is rather interesting, that it can vary from to lowest to almost the highest.

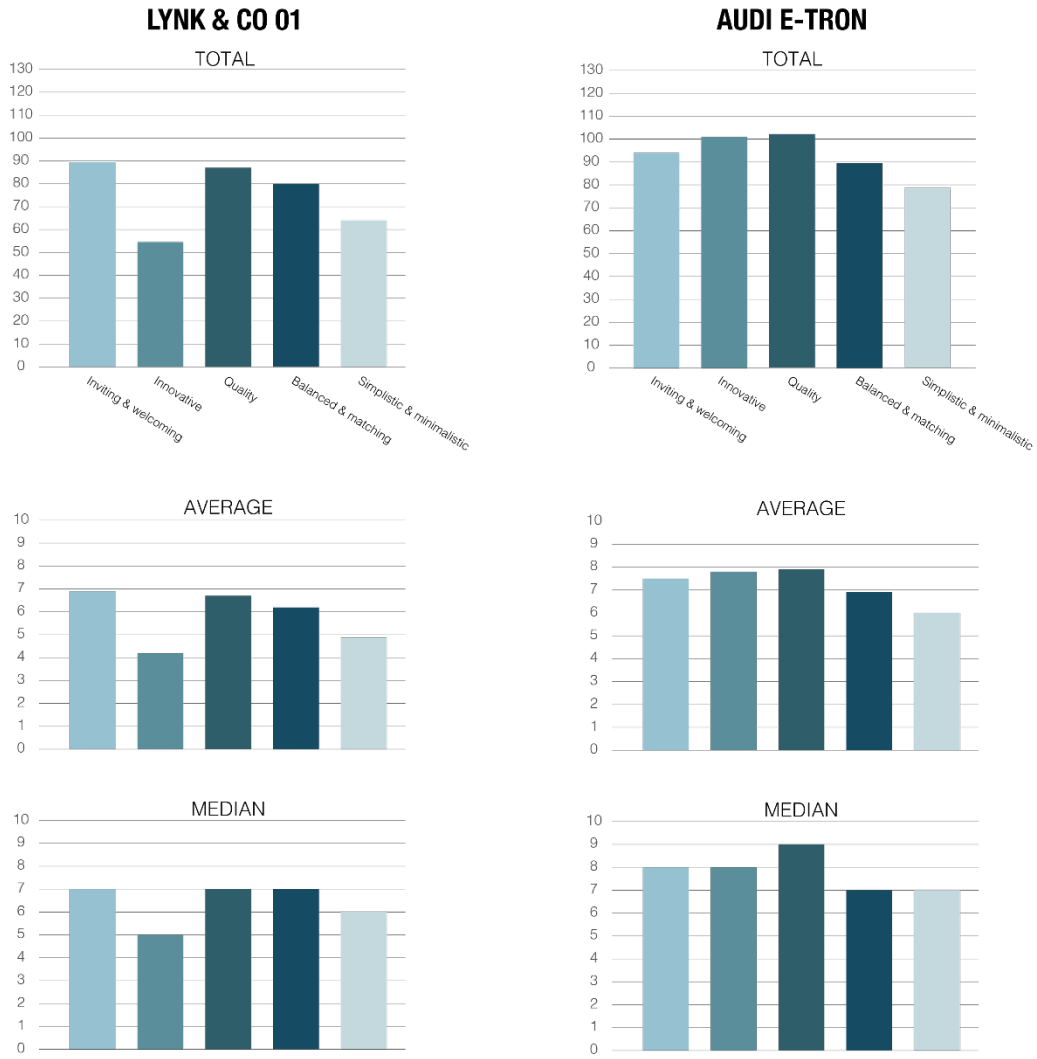

Figure 7. Ranking results

4.2.4 KJ-analysis results

The results from the interviews and follow-up questions explaining the reason for the chosen score in the ranking are summarized and analysed in this section, categorised by each question.

First impression

There were a few different features which caught the eye of participants during the first impression study of Lynk & Co 01, see appendix 7 for compiled comments. The red stitching was often observed by the participants indicating that contrasting details is something that attract attention. Another feature is the infotainment display and system, in this case a welcoming sequence starts when opening the door, thus enticing attention. This correlates with the scores from the blue post-it where infotainment system came in second place, one point less than number one. Some commented on the sound coming from opening the drives door, stating that it had a plastic feeling to it and an odd sound. No one commented on the sound from a positive perspective which could be because a feature might go by unnoticed when perceived as natural or expected, only being noticed when deviating from the expectations.

The steering wheel and logo on it seem to draw the attention, a participant commented that it is because it is the first thing one holds when entering the car and drivers' seat. This correlates with the observation that the participant grabbed the wheel after entering the vehicle as well as the result from the blue post-it where the steering wheel came in first place. Moreover, the general impression was that the Lynk & Co felt a bit crowded to enter, that the exterior gave the perception of being spacious, but the interior was contradicting. It was also perceived as cluttered due to too many details, different materials, discontinuous curves and shapes. Indicating that it is important to create a unitary impression of the interior which correspond with the perception of the exterior.

The infotainment system and displays were also attracting the attention in the Audi e-tron, probably more so than in Lynk & Co due to larger amount of various displays, see appendix 8 for compiled comments. The majority commented on the side mirror camera displays, being something new and unusual which might be the cause for taking first place in the score of the blue post-it. Also, the fact that all the displays lit up when opening the door thus attracting the attention. Moreover, the ambient light features such as LED-lists in doors, centerstack, IP and around the sockets for the safety belts also drew the participants attention. There is also a light feature in the door, visualising the e-tron logo on the ground with a light when the door opens, this was mentioned by some of the participants and one stated that it actually redirected the focus from the environment of the driver's seat to the door.

The steering wheel and its logo also caught the participants attention in the Audi as for the Lynk & Co, correlating with the score from the blue post-its where it came in second place. The question is whether this applies generally or if it is unique to these two models, which is hard to distinguish since all participants interacted with the interior from the driver seat. Something that speaks for the latter is that the logo emblem stands out from the rest of the steering wheel in terms of material, surface finish and colour. In both cases, the logo is elevated from the wheel surface in a glossy chrome finish.

Inviting & welcoming

Most participants talked about the driver's seat as well as the ingress area when asked about how inviting and welcoming they perceived Lynk & Co 01, see appendix 9 for compiled comments. Most comments about the seats were positive, saying that they looked comfortable because of the padding and inviting because of the form of the back on the driver's seat. Some commented that the ingress area looked spacious, but some thought it looked crowded because there were lots of things going on and they though it looked cluttered and messy. A cleaner design might contribute to a more spacious look. Another feature that was described to contribute to the perception of the vehicle being welcoming was the video in the infotainment system that emerged when the participants opened the door. The average and total scores of the interior were above medium, so it was perceived as inviting and welcoming but there are room for improvements.

The opinions regarding the Audi e-tron had a wider spread, see appendix 10 for compiled comments. Just as for the Lynk & Co 01, the seats and the spaciousness were considered by the participants, but there were more design attributes apart from that which caught the attention of the participants. Regarding the space, no one said it felt crowded, they only said it felt spacious and more so than Lynk & Co 01. The seat also received positive comments, besides from one participant who stated that the alcantara material does not seem smooth to sit on since it could create resistance. A few also thought that the sharp edges in the form language created an uninviting feeling. It was not perceived to be cosy which would have been better preferred. As well in this car it was important for the inviting and welcoming feeling that the screens lit up when the car door opened. Altogether, the vehicle received a total of 94 points and an average of 7,2 points. Generally, the opinions and comments were quite spread for this car but similarly to the Lynk & Co 01, the seats, the ingress space, and the screens that lit up seems most important to consider when investigating how a car should be designed to be perceived as inviting and welcoming.

Innovative

When the participants were asked about how innovative they perceived the interior of Lynk & Co 01, many stated that they thought about it as an ordinary car and not especially innovative in comparison with other cars, see appendix 11 for compiled comments. This is reflected in the ranking results where it was given an average as well a total score a slightly below middle. Many also said that the features in the car can be seen in other cars and it contains features which can be expected from a car, nothing more and nothing less. However, there were also a few who expressed that the infotainment system was innovative and raised the overall score when they were asked to rank how innovative they perceived the car. Apart from the infotainment system, also the wireless charging function one person pointed out as innovative. Another thought that the feature being innovative was the dimmer.

Since the Audi e-tron have more features that have a higher technical level, many described their first impression of it as more innovative than Lynk & Co 01, see appendix 12 for compiled comments. It received higher scores than Lynk & Co 01, an average of 7,8 of 10 and a total of 101 of 130. Examples of the high tech features the participants pointed out were the multiple screens, which consists of double screens in the infotainment system, camera displays instead

of side mirrors and a dimmer. Also, the lights and the gearshift were recognised as innovative. However, starting to look around in the car and talking about their thoughts when doing so, some mentioned that even though it felt more innovative with the technical features, none of them were very revolutionizing since they can be seen elsewhere to. Apart from the technical features, it was perceived as a normal car. One participant stated that the form language in the driver's area was futuristic and reminded of a spaceship. One other participant thought that the sharp edges in the form language was reminding them of the 90's and there could be a better balance.

Quality

What seemed to be the most important for how the quality was perceived when the participants were interacting with Lynk & Co 01 was the visual and haptic appearance of the materials in the interior as well as the details and form language. The trim-surfaces, the chrome material and the button left to the steering wheel were considered to lower the grade on the ranking scale, see appendix 13 for compiled comments. The plastic was mentioned by some as a factor for a lower grade. Altogether, the opinions were spread, and some thought the quality had much room for different improvements. While others thought it was fine which is reflected in the ranking that varies from five to eight, but most gave it seven points, see figure 7.

For both the Lynk & Co vehicle and the Audi e-tron, the plastic was a focus area and it was described by participants that a plastic look lowers the impression of the quality. Some also commented on the piano high gloss black, that it easily could look greasy and dirty which is not good. It was also clear that Audis brand identity contributed to the perception of high quality, see appendix 14 for compiled comments.

Balanced & matching

There were split opinions on whether the interior of Lynk & Co 01 was balanced and matching or not, see appendix 15 for compiled comments. It was concluded that even though it can be balanced and matching to some, not all may agree. It can also be balanced and matching but not appeal to everyone due to different tastes. Many commented on that it was too cluttered and there were too many colours, material and split lines for it to be perceived as balanced and matching. However, not everyone stated this since a few also said that shapes and materials were reoccurring, and that nothing stood out. Some thought that the red details were balanced and matching with the rest of the interior, but they would still prefer to remove them.

In the interior of the Audi e-tron, participants pointed out that there were quite a few mixed materials and shapes which created a sprawling look, while others described it as consistent, see appendix 16 for compiled comments. The participants also discussed the colour of the interior, which was a lot darker than the Lynk & Co. This made it in that sense matching, but it was also perceived as too dark by some. Moreover, some style mismatches were discussed, some features appeared old fashion which mismatched with the high-tech features. Overall, both cars received scores slightly above the middle, were Audi e-tron received the highest score out of the two.

Simplistic & minimalistic

The Lynk & Co 01s interior was perceived as less simplistic and minimalistic in general compared to Audi e-tron amongst the participants. Some of the comments regarding the perception of Lynk & Co 01 was that it was too much going on in the interior, to many controls, details such as the coloured and patterned trim-detail in the doors. Moreover, big variation in form and curvatures were stated to be the reason by the participants, see appendix 17 for compiled comments. This somewhat correlates with the score from the ranking, it was given a total of 64 out of 130 and an average of 4.9 out of 10. Both the average and total indicate a neutral impression due to the scores close to the middle on both scales.

The interior of Audi e-tron was rated slightly higher but there were some negative comments here as well. In general, the participant stated it had too much unnecessary components as well as being to advance. It was described as more high-tech and modern in terms of the technical functions which is not the same as being minimalistic, see appendix 18 for compiled comments. The interior of the Audi e-tron was given a slightly higher score than Lynk & Co 01, a total of 78,5 and an average of 6. Both vehicle's interiors were commented on overall negatively by the participants and were given rather neutral score, none of them were perceived to be minimalistic or simplistic.

Which car would you choose & bothering elements with the cars?

11 out of 13 participants would choose Audi e-tron if they had to make a choice between the two models, see appendix 19 for compiled comments. Some of the reasons behind was a better overall quality, more thoughtful design choices and the visual appearance, materials, colours and details. Furthermore, the participants stated that it feels more innovative and high-tech. Audi e-tron's features are perceived as more positive in general. This result also correlates with the ranking, were Audi e-tron received higher scores overall compared to Lynk & Co 01, see figure 7. However, if the participants individual scores of the two models are evaluated, it shows that three of the participants choosing Audi e-tron actually gave a higher overall score to Lynk & Co 01 than Audi e-tron. It is a marginal difference of one point for two of them, but the third participants scores have a slightly higher difference of four and a half points higher for Lynk & Co 01 than Audi e-tron.

Two out of 13 would choose Lynk & Co 01 due to a feeling of being more inviting, innovative and fresh. Audi e-tron is perceived to be something an older target group would use, a participant stating that it is a car for one's father, it is more masculine and sportier. However, one of these participants still gave Audi e-tron higher scores in the ranking, nine and a half points more, which is quite a big difference distributed over five attributes. Whilst the other one gave quite similar scores to both models, only three points higher for Lynk & Co 01.

The red stitching and patterned trim-detail are stated as the most bothering features for the Lynk & Co 01, this was also the result from the orange post-it. For Audi e-tron it is the double displays above the centerstack and the high gloss black pianolack surfaces which are perceived to be bothering. This is also seen from the orange post-it ranking, however, the gap in the centerstack, the gearshift, drivers' seat and steering wheel were pointed out during the post-its but were not as highlighted during the concluding interview. The quality of the materials and excluding design are mentioned as bothering for both the models.

Colour, material & illumination

There were a lot of comments regarding the colours and it seems to be a matter of taste, see appendix 20 for compiled comments. The majority seems to prefer the dark interior of the Audi e-tron due to a feeling of being coherent, modern and clean. However, some say that it is too dark and dull due to lack of contrasting details. A few participants liked the contrasting beige roof of the Lynk & Co 01 and the red accent colour, but no one seemed to favour the honeycombed patterned trim-detail. Furthermore, there were also some comments that the beige roof mismatched with the black and red colours of the interior. Audi e-tron was considered as more spacious despite the darker interior, which might be due to differences in physical metrics and interior lightning between the models.

The haptic feel and visual appearance of the materials seems to be of importance, were plastic appears to be a critical aspect and perceived as something less qualitative and unfavoured throughout. The Audi e-tron seems to be preferred amongst the participants in terms of its materials. The participants state that both the plastic surfaces along with the chrome-details have a better visual appearance and higher quality in Audi's case. The reason for this might be due to better execution and harmony or higher qualitative materials as described by the attribute leader of materials. A smaller amount of variating materials seems to be preferable and providing a more coherent and cleaner visual appearance according to the participants. Nevertheless, there should be variations in materials and surface finishes since it seems to be favourable in terms of creating a dynamic impression. Lynk & Co's material composition of the seats is favoured amongst the participant with comments such as more comfortable, smooth and preferring the leather over the alcantara which Audi's seats have. There were also some concerns with having certain surface finishes and materials collecting dust and leaving fingerprints.

The impressions of both cars' illumination are divided amongst the participants. Some prefer the interior lights of Lynk & Co 01 and are perceived as more soft, cosy and warm. Stating that the Audi e-tron have to many sources of lights and being too intense, furthermore still being too dark despite all the ambient lights. This might be due to the phenomena mentioned by the light designer, were a dark environment might still be perceived as very dark despite added light sources. The infotainment display and welcoming film sequence in the Lynk & Co 01 was appreciated and attracting the attention due to being lit up when opening the door. Moreover, many participants stated that they did not even notice the interior ambient light in Lynk & Co 01. That the ambient light of Audi e-tron was favoured due to being a fun feature, useful when its dark outside, modern and aesthetic.

4.3 Conclusion user studies

After performing and analysing the user studies it was clear that some specific areas of the car interior catches the eye of the persons within the target group, thus having larger impact for the first impression. One of the things that was important for the first impressions was that the screens in the vehicles lit up when opening the doors. This caught the eye and contributed to an inviting and welcoming feeling. When the participants were asked about how inviting and welcoming the vehicles appeared, many also focused on the seats as well as the feeling of spaciousness. It seemed like the spaciousness was not only affected by the actual space itself, but also by the amount of details in the surrounding area that was in the field of sight when entering the vehicle from the driver's door. A cluttered look makes the space for stepping into the vehicle appear smaller. A less crowded look would contribute to a more inviting and welcoming feeling.

Many participants focused on the steering wheel since it always will be in field of view when driving the vehicle and affects how it feels to manoeuvre it. This makes it a very central feature for the driver were its size, shape and materials are important. The materials were a factor that many focused on when interacting with the vehicles, both how the materials looked and how they felt were considered. It appears important that they do not have a plastic look or feel to them and that they do not gather dirt but remain clean and fresh looking. Almost everyone spent a lot more time focusing on the front part of the interior and not the backseat. Some never looked in any other areas then the front seat, only a couple spent a significant amount of time evaluating the rear seat. No one looked in the car trunk. It was concluded that the area that the driver was interacting with was getting a lot more attention than the rest. Also, the passenger side received more attention due to being in the field of sight from the driver's seat.

Many participants mentioned that their impression of the quality was affected by the knowledge that one of the vehicles was an Audi which they already had a mental model for. This correlates with the theoretical research, where it is mentioned that the brand heritage is important for the perceived quality. Furthermore, this correspond and supports the results from the ranking where Audi received higher scores on quality than Lynk & Co which is not as common and does not have an established reputation. Moreover, high-tech features also made a strong first impression on many participants, but it is not necessarily only positive having a lot of advanced functions. Even though most participants would have chosen the Audi e-tron as their final choice, many talked about if the high-tech features were actually necessary.

5

Concept Development & Evaluation

This chapter contains the methods and results that was used to develop guidelines and concept proposals. Furthermore, it also describes the methods that was used and results that were generated when evaluating the concept proposals and guidelines. The iterative process of mapping the guidelines provided valuable ideas and insights used during the ideation. The evaluation poll also provided insights used to establish the final concept proposal and the differences regarding designing for sharing vs owning a car.

5.1 Methods

To develop guidelines and a concept proposal, different methods were used which are described in the following sections. Furthermore, the methods and results from the evaluation of the guidelines are presented. Some methods were developed to fit this unique project, whilst others are well known and established.

5.1.1 Mapping guidelines

The results from the theoretical research, benchmark, interviews with experts, observations, first impression journey and KJ-analysis were compiled visually. This in order to identify commonalities relevant and useful for the establishment of guidelines supporting the research questions. The visualisation of the results consisted of different columns, which all represented different parts of the research that had been done. Each column contained smaller squares with data that was the results most relevant from previous research and analysis. When all the information was gathered and visualized, the different squares were connected based on the information in them. All squares that could be connected had arrows drawn from them to external squares where a summarizing word or description was written. These descriptions composed main categories for the guidelines which were going to be established by further analysation.

5.1.2 Evaluation of guidelines

In order to gain knowledge about how the guidelines was perceived by the target group as well as how they value and analyse the interior of a car in regards of sharing it with others, a poll was sent out. It was sent to the same people who took part in the user study as well as new people within the target group, see appendix 21 for poll template. The poll consisted of guidelines which were the result of the theoretical research, market analysis and the user studies. One of the guidelines were excluded from the poll since it was not suitable to be evaluated in this format but already had a very high reliability and validity from the user studies. The 27 participants were asked to rank the remaining eight guidelines from 1-8, were 1 is perceived as most important for the vehicle to inhibit when sharing it with others. Then they had to motivate their choice of statements for the first and second one. The final questions were to understand if their choice would be the same if they were to purchase the car instead of sharing it, to get an understanding if there is a difference and if so how come. Every participants ranking score of a guideline were added and summed up into a final score, this was done for every guideline. A low total score therefore meant that it had received a high ranking. For instance, if three participants ranked a guideline as the number one most important guideline, it received a total of three points from them together.

5.1.3 Idea generation

The idea generation phase for the concept development consisted of different versions of brainstorming and brainwriting. Österlin (2011) describes brainstorming as a method were everybody is heard, critic and judgement are forbidden, and the goal is to come up with as many ideas as possible. Ideas outside of the box and creating solution of combining different emerged ideas are encouraged. Brainwriting is a method similar to brainstorming were each member come up with ideas individually (Österlin, 2011). At first, different ideas and thoughts were generated on short time intervals of a five minutes. After this, the guidelines were used as inspiration for individual idea sketching. The ideas were then discussed in the project group and evaluated in relation to the guidelines, since these worked as a form of specification of requirements. Based on this evaluation a final concept was designed.

5.2 Results

The results from the mapping of the guidelines and the evaluation of the poll are presented in this section along with the ideation and development of a concept proposal and re-designed of the Lynk & Co 01 interior.

5.2.1 Result of mapping guidelines

Nine different categories were identified during the mapping, were all of them are relevant in terms of the first impression, premium design and perceived quality. The categories are; qualitative appearance, convey a message, clean minimal coherent & spacious, attractive to senses, perceived premium, level of complexity, conscious design choices, inviting & functional lightning and driver's area most significant, see figure 8. These could further be analysed based on previous research results. Some of the noted attributes can be found in several categories. The first section below each heading is the guideline itself and elaboration is found in the second paragraph.

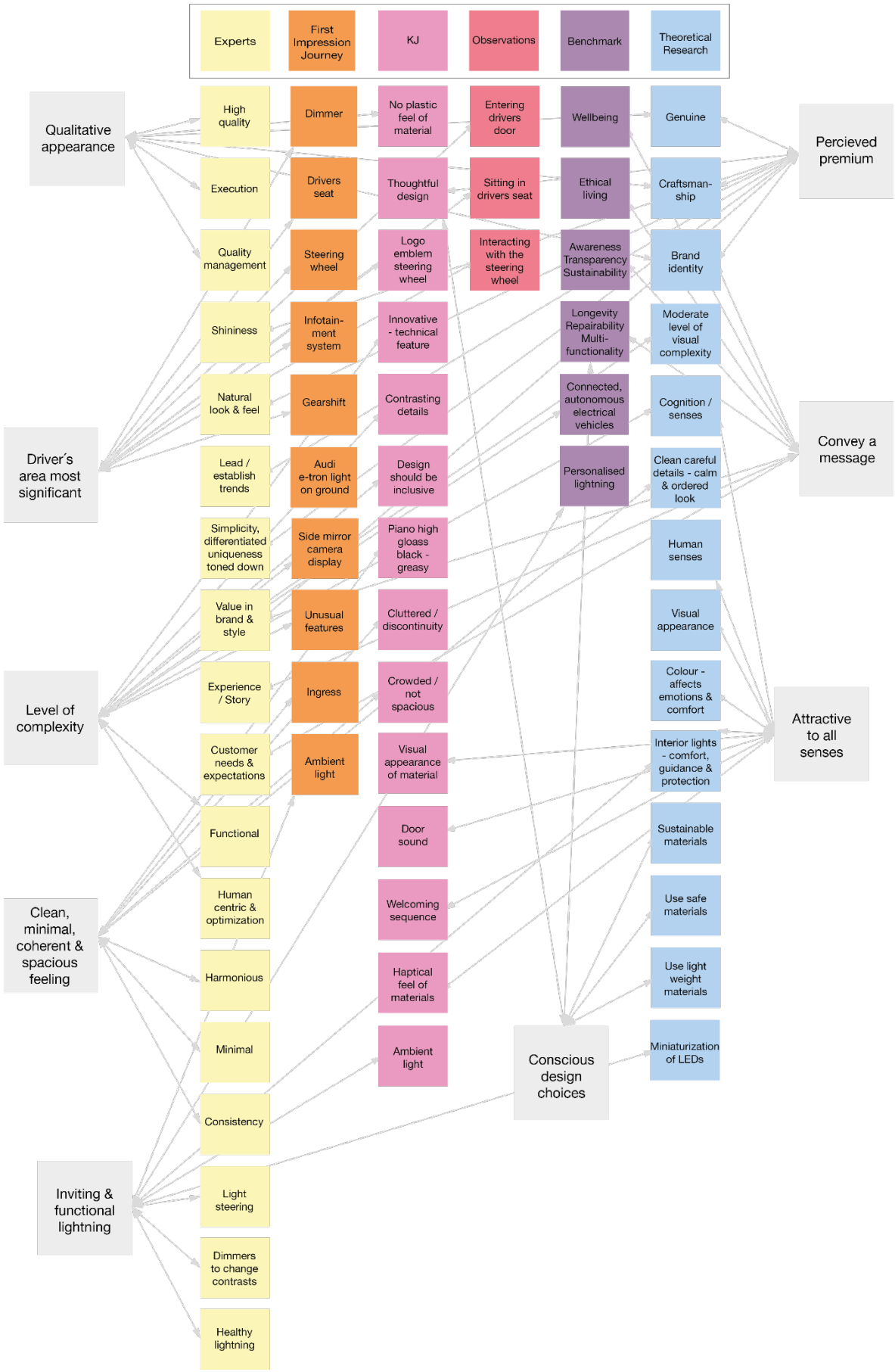

Figure 8. Analysis visualization for guidelines

Qualitative appearance

It is important to create an obvious qualitative appearance of the interior, it should be perceived as precise and a plastic appearance should be avoided to create a good and qualitative first impression.

This category consists of high quality, quality management and execution based on the data collected from the experts. From the theoretical research the attributes of genuine, craftsmanship and brand identity were identified to affect the qualitative appearance. Finally, the attribute of no plastic feel of material from the KJ-analysis. This category seems to be all about the material and execution of the components, that it feels authentic. Furthermore, one can see physiological traits such as brand identity, a feeling of being genuine and craftsmanship. The focus is on haptics, visual appearance and cognition.

Convey a message

The appearance of the design should convey a clear message that appeals to the target group. This can be done by the choice of materials, lights and geometries. It can also be conveyed through the brand identity.

The category of conveying a message includes brand identity from the theoretical research. The attributes of customer needs & expectations, experience/story and value in brand & style from the experts. From the benchmark the attribute of ethical living, wellbeing, awareness, sustainability and transparency. Furthermore, longevity, repairability and multi-functionality. All of these attributes are related to the perception and impression.

Clean, minimalistic, coherent & spacious

The design should be coherent and consistent throughout the interior to create a precise and minimalistic appearance. This in order to achieve a spacious, harmonious and clean appearance.

From the KJ-analysis it was clear that the attribute of not feeling crowded or cluttered is key to achieve a feeling of spaciousness, coherent and minimal appearance for the interior. It should also appear hygienic, without becoming greasy like it did on the piano high gloss black. Attributes from the experts for this category are minimal, consistency and harmonious. The attribute of clean careful details – resulting in a calm and ordered look from the theoretical research. Finally, the importance of having an ingress emitting a sense of spaciousness from the first impression journey. All of these attributes are physical to some extent, it is about the composition of the different elements of the interior along with the perception of it.

Attractive to senses

It is important to attract and appear appealing towards the visual, haptical and audible senses, in this specific order.

The attractive to senses category consists of visual appearance/aesthetics, human senses, colours affecting emotions & comfort and the interior lights – offering comfort, guidance & protection and the cognition/senses from the theoretical research. Moreover, the attribute of both haptic and visual appearance of material, door sound and welcoming sequence from the KJ-analysis. Main focus seems to be towards the visual and haptical senses, sound seems to of importance as well, both emotions and cognition are involved.

Level of complexity

Many high technical features attract visual attention, but it can be too much and lead to a frightening feeling, therefore the visual amount of new technology should be moderate.

The design should be inclusive, contain contrasting details and appear innovative with technical features, these attributes are from the KJ-analysis for the category level of complexity. From the experts the attributes consisted of functional and human centric & optimization. Cognition/senses and moderate level of visual complexity were identified from the theoretical research. The side mirror camera display and unusual features were collected from the first impression journey. From the benchmark the attribute of connected, autonomous, electrical vehicle were identified. The number of technical features seems to affect the impression, and all of these are physical attributes which affect the cognition.

Conscious design choices

It is crucial to make conscious design choices in terms of materials, functionality and design of the car interior. The materials should both be friendly for the environment and humans.

A lot of different attributes connected to the choice of materials were identified during the theoretical research thus being a part of the conscious design choices. Sustainable materials, the usage of safe as well as lightweight materials to decrease emissions and improve the environment within the vehicles, according to the research. Longevity, repairability and multi-functionality were identified during the benchmark. Thoughtful design choices were something which also emerged during the user studies and is also identified for the conscious design choices category.

Inviting & functional lighting

The lights in the vehicle should be welcoming, and first and foremost meet functional needs rather than only being decorative.

During interviews with experts a lot of information about how lights should be functional and how they can affect people were discussed. It should be functional and meet the needs of the user. How it is designed affect the user's perception of it a lot, good lighting goes by unnoticed and no one mentions it, whilst bad lighting is noticed in a different way. It is possible to use dimmers to adjust contrasts, offer light steering and have healthy lighting, these attributes were identified from the experts. From the benchmark it was concluded that light settings can be personalised in car sharing systems and the theoretical research described the miniaturization of LEDs and that the interior lights can offer comfort, guidance and protection. The ambient e-tron light projection and general ambient lightning were seen during the first impression journey, ambient light also came up during the KJ-analysis.

Perceived premium

Perceived premium lies within the details and balance between different elements in the interior, it should be distinguishable that everything it thoughtfully designed and chosen. Therefore, it is key to choose materials carefully and weigh the price versus quality.

From the theoretical research attributes such as craftmanship, genuine and brand identity are recognised. All of these are also found in the category of qualitative appearance which is realistic since the two categories are strongly connected. A design which have a natural look & feel, simplicity, differentiated, uniqueness and are toned down as well as a correct amount of shininess where identified to create a premium appearance according to the experts. Moreover, to lead/establish trends and have value in brand & style were also mentioned to affect the perception of premium. The attribute of thoughtful design was collected from the KJ-analysis.

Driver's area most significant

These attributes within the area are the ones which attracts the visual attention the most during the first impression, this should be considered during the design process.

The category of drivers area most significant consists of attributes from the first impression journey and it includes the infotainment system, steering wheel, gearshift, driver's seat and the dimmer. Furthermore, the attribute of logo emblem steering wheel from the KJ-analysis. These are the attributes which attracts the attention during first impressions according to the results from the user studies. These are physical attributes which attracts the attention and thus will be in focus for the ideation of a concept proposals.

5.2.2 Poll on guidelines for car sharing

The results from the poll showed that the most important guideline for sharing the vehicle was number three that includes a clean, minimalistic, coherent and spacious appearance. 12 people out of the 27 people who answered the poll placed it as the number one most important guideline. The other participants placed it number two and some also placed it as the third most important guideline. Only one did not give it a top placement and placed it as number six. Many motivated their choice with that a clean and minimalistic design contributes to a more hygienic and fresh appearance which is important for a shared car. Another common motivation was that it is easier to interpret everything in a shared car if there are not too many impressions that makes it harder to understand how to operate it. Also, that a clean style is more aesthetically appealing and could appeal to a broader crowd was mentioned. Motivations for why it was ranked so high by everyone except by one were the following:

"Since it is not your own vehicle, you should be able to trust that the vehicle is clean and hygienic without having to do a long check. A minimalistic and harmonious appearance helps with that. "

"If you share a car, it is important for me to understand the car quickly, find controls etc. Too much information and features make the first impression overwhelming. Hygienic and spacious is nice to feel when you use a product that other people also use."

"When something is shared it is also important to get the feeling that the car is clean when stepping into it, so by making the design minimalistic and clean, with surfaces that appears clean you get more comfortable and relaxed."

"Clean, minimalistic etc. – A matter of taste. When I'm using something that I know that others have used before me, for example a hotel room, I want it to be clean and minimalistic because it feels that it can adapt to a wider range of taste."

Qualitative appearance was ranked as second most important guideline for vehicles used for sharing. However, the ranking is widely spread from one to eight and everything in between. The visual appearance and haptic feel of materials are stated by the participants as the reason by those who ranked it as number one or two. Moreover, that this is what one looks for when entering the vehicle and forms the first impression. Two of the statements regarding the qualitative appearance from the participants:

"First impressions are always important, but probably even more important for car sharing services (since you will only have the car for a short time). So, having an interior which looks and feels nice directly would probably help a lot."

"In general, I don´t like when a detail feels very plastic and especially not in a car. The car's inside should be of good quality."

The guideline – attractive to senses ended up in third place where the reasons were similar to the ones for the qualitative appearance. That the attractiveness to the senses affects the overall impression of the vehicles interior and the experience of it. That the senses are used to form the impressions which correlates with the insights from the theoretical research regarding the human perception and theory behind first impression. Two motivation for its ranking:

"That are enjoyable to use for the different senses. And also, that the senses affect how I feel about the interaction and usage of a product and the experience. "

"The most important aspects are the object that I see, feel and touch and therefore, senses got the highest grade. The haptic feeling also affects the feeling of quality..."

The guideline that was prioritized last was *Inviting & functional lighting.* As stated in the in the interview results with the experts, users tend to only think about lighting when it is poorly designed. When it is good, users do not pay attention to it. That could be a reason for why the guideline was placed last, the target group does not pay much attention to lighting when it works. They do perhaps not think about how it serves them in positive ways, only when it does not serve them well. This could imply that the guideline still could be important, but the users would not reflect much over it as long as the design serves their needs in a good way.

17 out of the 27 participants were asked if their choice of statements as most important for the car interior to inhibit for sharing, would be the same if they instead were to purchase it. Only three answered yes, indicating that the prerequisites are different for designing towards owning versus sharing the car. The majority answered no, with the motivation that the guideline of clean, minimalistic, coherent & spacious is not as important since the hygienic aspect of it is less critical when not sharing it with others. Furthermore, the level of complexity was also mentioned as something that becomes less important when owning the car since one will learn the functions over time when owning the car. In a shared car it is more important that it is intuitive and not complicated. The participants also stated that the guidelines of qualitative appearance and perceived premium would be ranked higher. That the appearance becomes more important, since it is more of a long-term usage and connected to one's identity.

"If you own the car, I think it is more important that it is attractive and that it convey a message. You might "care" more for the car. If it would be a shared car, I think I would put more value in factors such as clean and functional. Cars can be some sort of self-identification, and then it can be different if you own it versus sharing it."

Some of the comments in the poll were that most of the guidelines intervein with each other. Some said that the perceived premium and qualitative appearance are more comprehensive and includes all the other guidelines. Thus, indicating that all of them are relevant to provide a good overall impression.

5.2.3 Re-design of interior

The different ideas that was generated during the ideation phase are presented here. Further on, the ideas were compared with the guidelines, combined and developed into a final concept proposal presented in section 6.2.

One of the most eye-catching parts of the interior is the center stack. One idea was to change the shape of the chrome frame and make it more continues, see figure 9. Also decrease the number of separate surfaces and split lines and then remove the piano high gloss black. This was proposed in order to make the design more coherent and minimalistic in accordance with the guideline that was ranked the highest. Moreover, a suggestion was to make as many split lines as possible parallel and continuous to create harmony and coherency as well as eliminate all unnecessary lines.

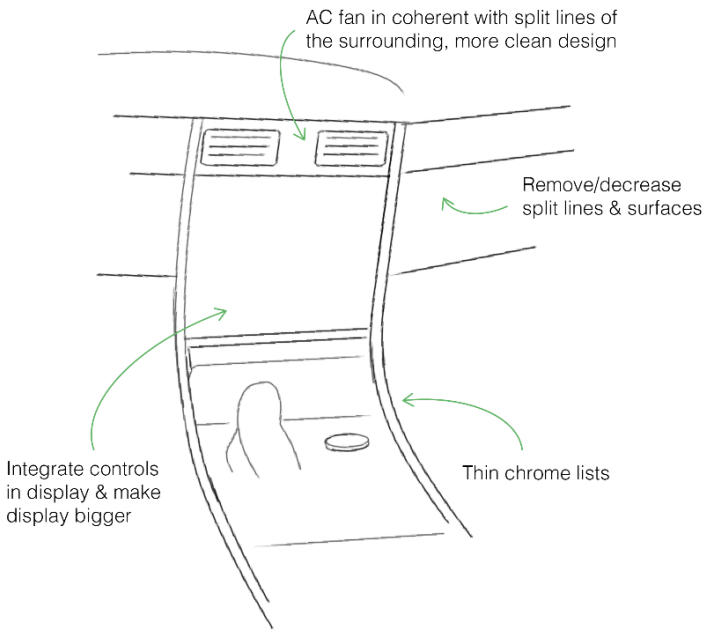

Figure 9. Ideas for the area around the centerstack & infotainment

The air-condition fans were pointed out by many and perceived as bulky thus demanding a lot of attention. To make them more discrete they were suggested to have the same surface level as the rest of the area, see figure 9 & 10. The chrome frame was made thinner to request less attention and the knob was given a less bulky shape. The fans were also positioned so that they would fit in line with the surrounding split lines, making the design more coherent and consistent.

The area to the left of the steering wheel and buttons was pointed out during the user studies as problematic due to having to many shapes and lines intersecting, different materials and unpleasant controls. The design of these buttons was changed, and they were moved to be placed in connection with the left AC fan, creating a flat minimalistic surface to the left of the steering wheel. The intersection between the IP and door were changed, the amount of materials and lines were reduced to make cleaner, see figure 10. The same change was adopted to the passenger's side as well.

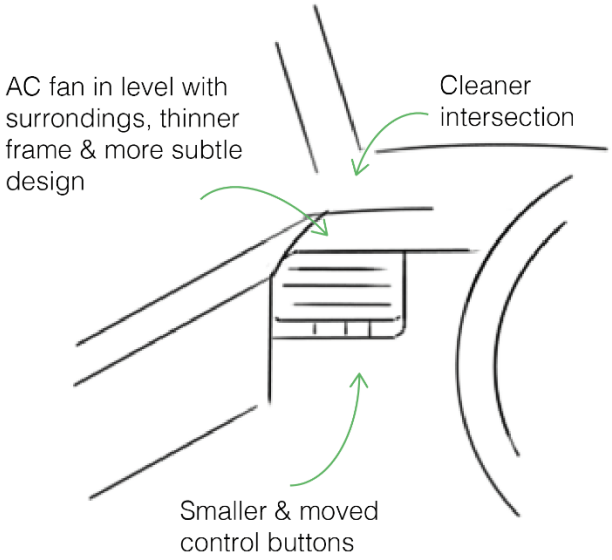

Figure 10. Ideas for the area left of the steering wheel

The honeycombed pattern and red colour on the trim-detail was brought up as disturbing and unwanted during the user studies. Therefore, the trim-detail was removed and the colour of the red stitching details on the IP, steering wheel and seats was changed to a more subtle and neutral colour, see figure 11. This to make the design more minimalistic in its appearance.

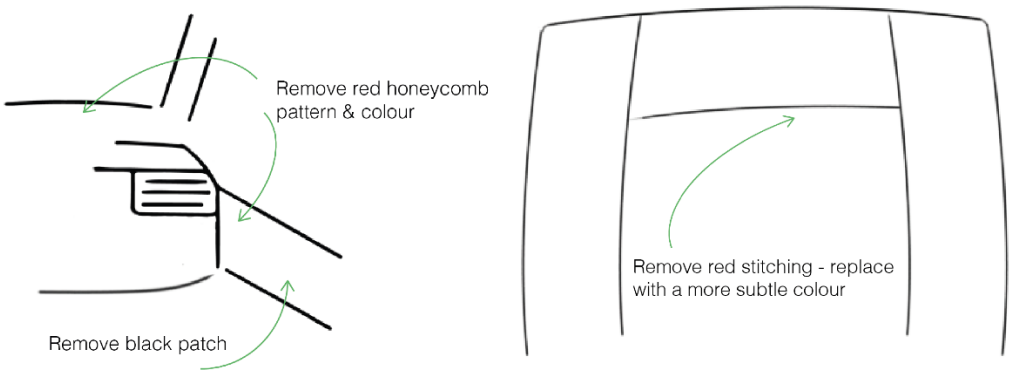

Figure 11. Idea for the stitching & pattern

Since one of the prioritized guidelines suggested that the vehicle should feel spacious, lights were suggested to be added in the area in front of the two front seats, see figure 12. This since the light could be used to make the area appear roomier.

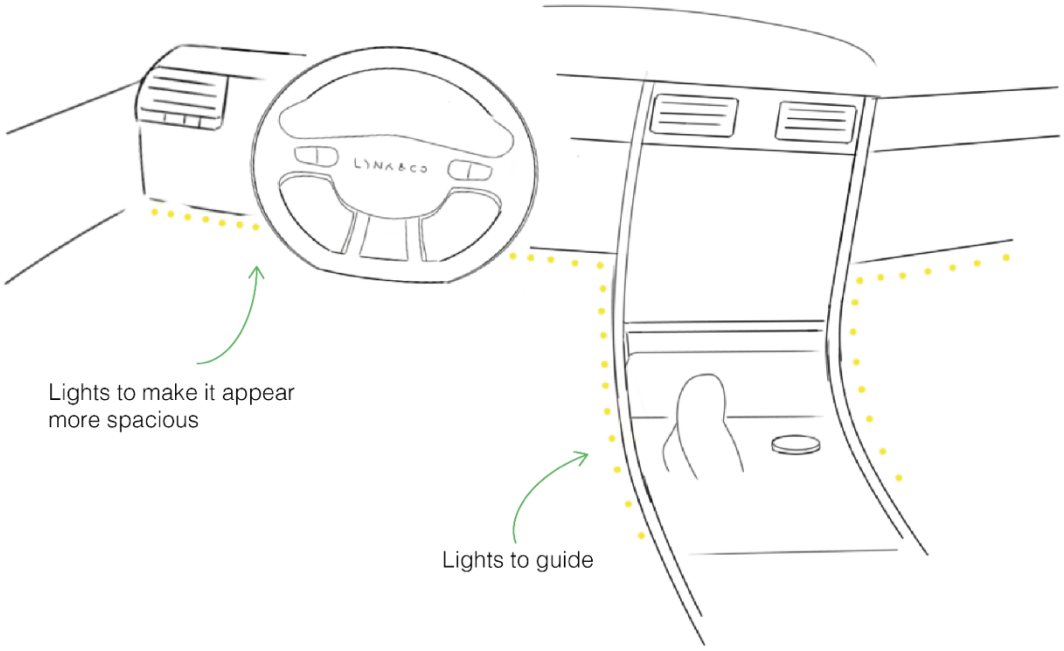

Figure 12. Ideas to make it feel more spacious

The dimmer behind the steering wheel was described as small, and the frame around it could be deleted so that there was more space for a larger screen which is more premium, see figure 13. Also, enhancing the functionality and the prerequisites for the interface.

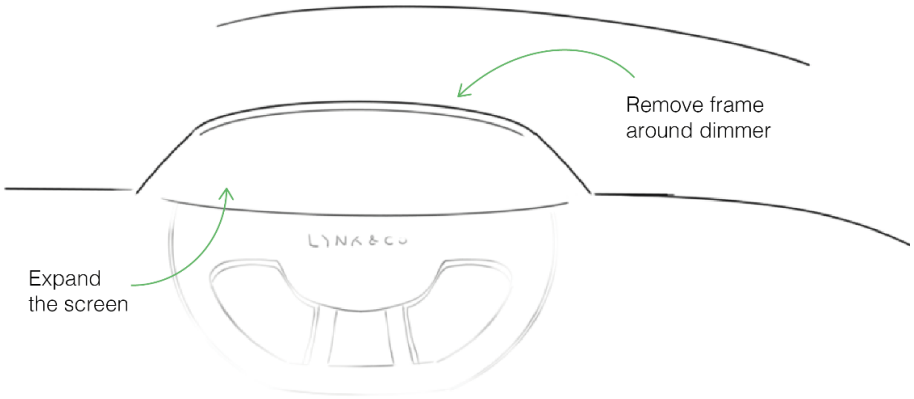

Figure 13. Ideas re-design of dimmer

The size of the steering wheel could be made larger regarding the gripping surface, the chrome detail made thinner and the buttons on the wheel integrated. This to make it more its appearance cleaner, more comfortable to hold and easier to integrate with, see figure 14.

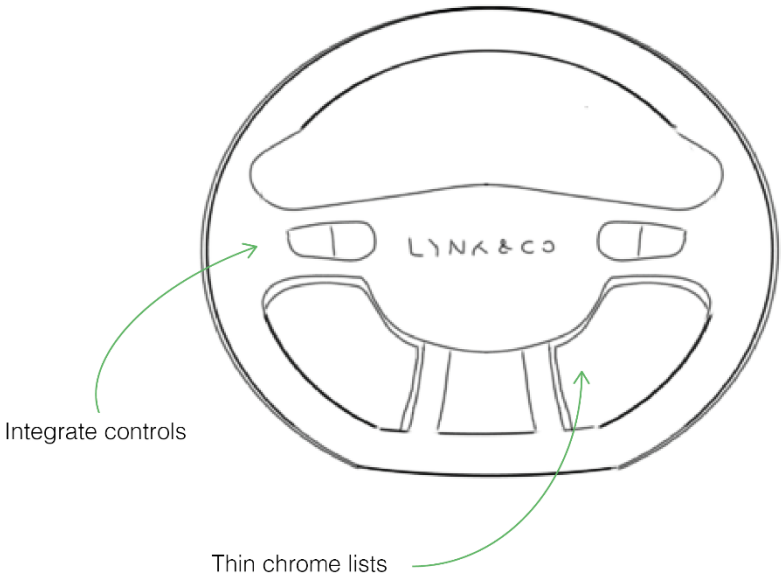

Figure 14. Ideas for the steering wheel

Other ideas to make the design align more with the guidelines that describes a premium interior was to remove the piano high gloss black to give it a more hygienic appearance since grease easily appears on this material. Another material choice could be used there instead. Also, the finish of the chrome could be changed since it was clear that the chrome in the Audi e-tron was perceived to be more premium. Generally, the final design proposals should consist of less materials, split lines, different surfaces and components.

5.3 Conclusion concept development & evaluation

The mapping of guidelines, brainwriting, brainstorming and evaluation-poll were the used methods during the development of concept and guidelines. Nine different areas were identified of importance to consider when creating the final concept. Resulting in eight guidelines applied to a specific area of the car interior. The guidelines functioned as a list of requirements when creating the concept proposals of the re-design.

6

Final deliverables

The theoretical research, market analysis and user studies finally resulted in generated guidelines and a concept proposal. The guidelines and concept proposal are elaborated and presented in detail in the following section. The answer to the projects purpose and research questions are both included in the guidelines and visualised with concept proposal.

6.1 Guidelines

The guidelines are here presented in the order of how important they are according to how they were ranked by the users in the poll. They have also been reformulated to highlight aspects that turned out to be extra important according to the results of the poll.

1. *Clean, minimalistic, coherent & spacious*
   The design should be coherent and consistent throughout the interior to create a precise and minimalistic appearance. It should also have a spacious, harmonious and clean appearance in order to present a hygienic, comfortable and intuitive appearance.

2. *Qualitative appearance*
   The interior should have an obvious qualitative appearance, it should be perceived as precise and a plastic appearance should be avoided to create a good and qualitative first impression.

3. *Attractive to senses*
   The design should attract and appear appealing towards the visual, haptic and audible senses, in this specific order.

4. *Perceived premium*
   Perceived premium lies within the details and balance between different elements in the interior, it should be distinguishable that everything is thoughtfully designed and chosen. Therefore, it is key to choose materials carefully and weigh the price versus quality.

5. *Level of complexity*
   Many high technical features attract visual attention, but it can be too much and lead to a frightening feeling, therefore the visual amount of new technology should be moderate, and it should appear intuitive, manageable and reliable.

6. *Convey a message*
   The interior of the vehicle should have sustainable materials and a thoughtful design where ethical living & wellbeing have been considered. The appearance of the design should convey a clear message through the choice of materials, lights and geometries. The brand identity is also very important for the impression of the vehicle.

7. *Conscious design choices*
   It is crucial to make conscious design choices in terms of materials, functionality and design of the car interior. The materials should both be friendly for the environment and humans.

8. *Inviting & functional lighting*
   The lights in the vehicle should be welcoming, and first and foremost meet functional needs rather than only being decorative.

6.2 Concept proposal

The concept proposal visualizes the guidelines and propose a re-design of the interiors front area in the Lynk & Co 01 model, see figure 15. Geometries, lights, colours and materials have been modified. To align with the guidelines, the geometries have been changed to appear more minimalistic. Split lines have been removed and different surface levels have been made flatter to make the appearance more coherent. The geometry lines have been made parallel and continuous to make the appearance more consistent. These changes have been applied to many areas of the front part, see figure 16 for original design.

Figure 15. Concept proposal redesign of Lynk & Co 01 interior

Figure 16. Illustration original design of Lynk & Co 01 model

Most changes regarding surfaces and split lines have been made close to the infotainment system. The chrome frame is more continuous and the surfaces around the display and frame are also consistent, more flat and split lines have been removed. On the IP in front of the passenger seat, the split line that had a curvature have been made straight and parallel to the silver line, which have been made longer and now goes from edge to edge. Also, the chrome around the fans have been removed, see figure 17 for visualisation of the difference. On the left side of the steering wheel, the two buttons have been moved higher up and are now placed in connection with the fan above. This was done to create a clean surface left to the steering wheel and to give the buttons a placement where they would fit more naturally. Furthermore, the fans have also been moved just slightly to align better with the split lines on the IP. Altogether, these changes have created larger areas of clean surfaces and the fans have become less eye-catching since they are perceived smaller and no longer have shiny chrome around them that attract attention.

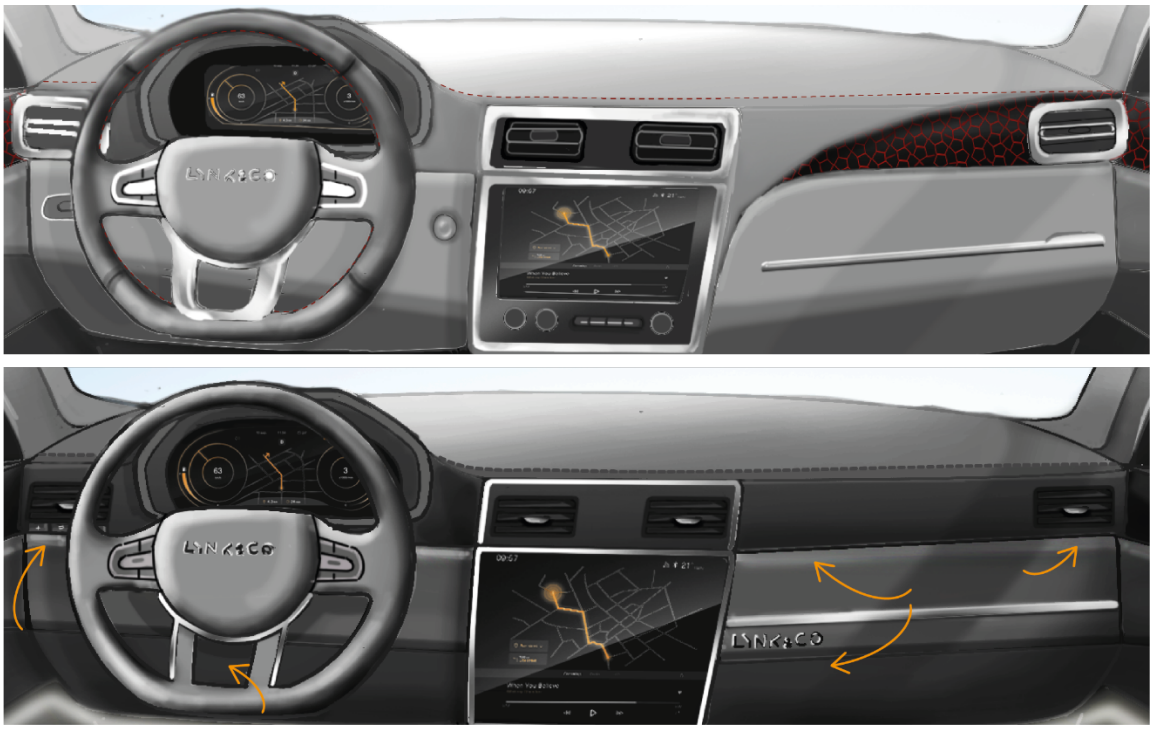

Figure 17. Comparison orignial (top) with re-design (bottom) lines, curves & surfaces

One of the established guidelines stated that the vehicle should be perceived as spacious and have inviting and functional lighting. Since lighting affects the perceived size of a room or area, ambient lighting has been added to the front areas where driver and front seat passenger has their legs. It was found during the user studies that a soft ambient light was appreciated when reaching for something in the small storage area around the gearshift when it is dark outside. Therefore, the stripes with LED light continues on each side of the centerstack to support and guide the users in this area, see figure 18 for comparison between original and re-design.

Figure 18. Comparison orignial (left) with re-design (right) guiding lights

The colour spectrum is set to more natural and subtle tones to amplify the premium feeling. Colours of details have been changed to more subtle ones and the texture of the materials along with the ambient light have a bigger impact on the colour's appearance. Other changes that have been made are limiting the number of different materials that are used and making choices to match each other, enhancing the qualitative appearance and premium feeling. The materials have also been distributed carefully to make it more coherent and minimalistic, also to avoid materials which may become greasy on areas that the users integrate with frequently, see figure 19 for visualisation of changes. The materials also must look and appear natural to raise the sense of premium and the qualitative impression. The choice of materials is made consciously and convey a message which correlates with the values of the target group. Furthermore, the materials haptic attributes are also taken into consideration to appeal to all the senses.

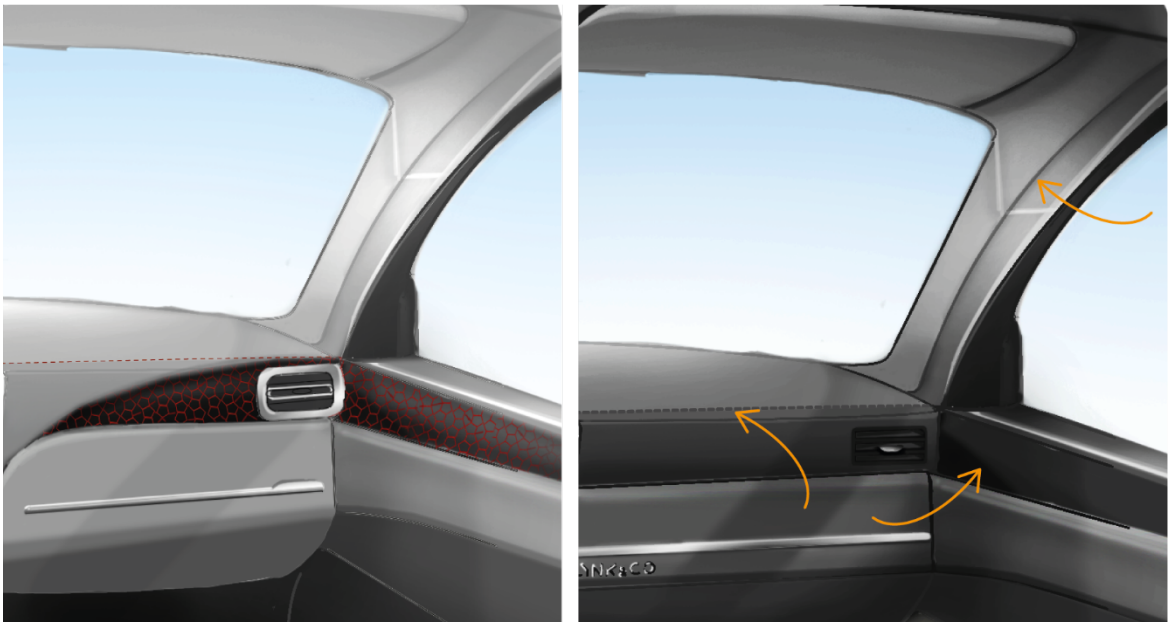

Figure 19. Comparison orignial (left) with re-design (right) change in colours and material

The number of visual controls has been reduced to make the appearance cleaner but also to ease the level of complexity. The infotainment display and dimmer has been enlarged to improve the readability and interaction. Controls have also been relocated and placed in connection to other elements of the interior to make it appear more minimalistic and coherent. Also, the area around the gearshift has been re-designed to reach a more harmonious and spacious design. On the IP the logo has been placed in front of the passenger seat. It was described as a nice feature during the user studies and had a positive effect on the PQ, see figure 20 for the re-design in detail and comparison with the original.

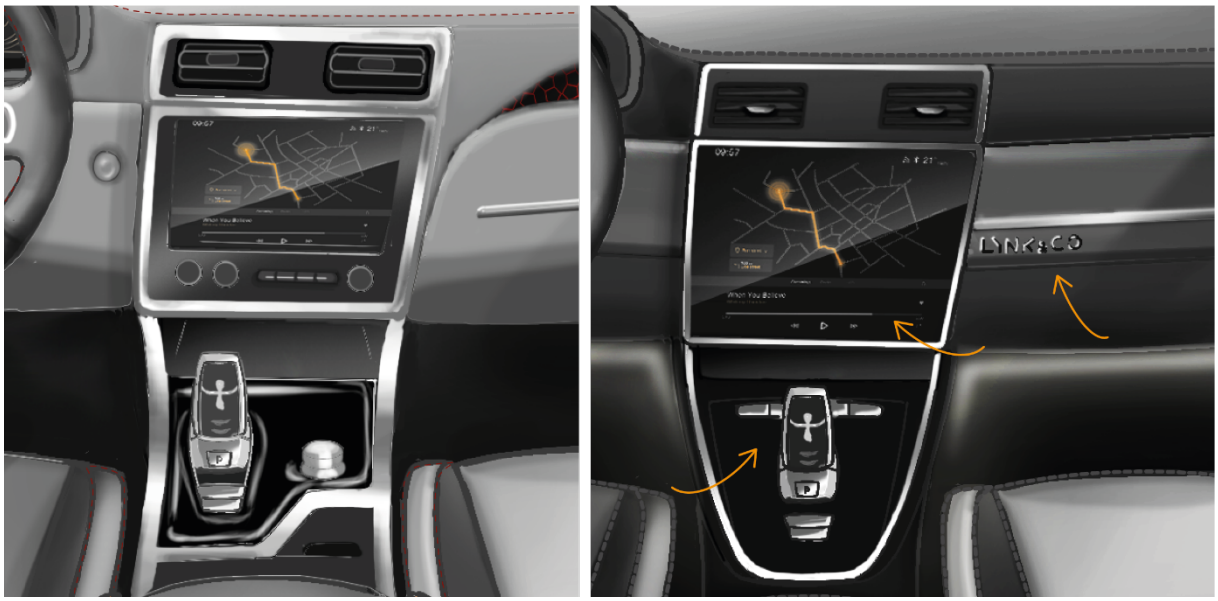

Figure 20. Comparison orignial (left) with re-design (right)

infotainmentsystem and gearshift area

Figure 21, 22 and 23 shows the rendering of a rapid cad modell created to illustrate the re-design of the interior of Lynk & Co 01. The rendering offers a better visualisation of the added materials, colours and lights.

Figure 21. Cad rendering re-design interior

Figure 22 show the re-design of the area around the centerstack and gearshift along with the added logo on the daschboard in detail. Moreoever, the inviting and welcoming lights contributing to the feeling of spaciousness. The new design of the steering wheel are visualised in detail in figure 22.

Figure 22. Cad rendering re-design of centerstack area, added logo and lights

Figure 23. Cad rendering re-design of steering wheel

6.3 Conclusion final deliverables

Eight different guidelines are presented in the order of their importance when designing an interior for car sharing. The guidelines were applied to a concept proposal as a re-design of the driver's area of the model 01 from Lynk & Co. The re-design was primarily applied to illumination, geometry & appearance, material quality and choice of colour.

7

Discussion

In this chapter are the methods, findings and final deliverables discussed in relation to the purpose and research questions. The future work and sustainability aspects of the project are also elaborated and discussed. The projects process, methods and research have all supported the fulfillment of the project purpose. It has provided insights and answers to which attributes of the car interior affects the first impression as well as what makes it perceive as premium and qualitative. Two different car models were used to verify that the findings are not tied to one specific model and brand. The strengths with the chosen process are the broad variation of used methods and information gathering from various sources, it provides high reliability of the results.

7.1 Methods

Every method and phase were built on the previous phases results in this project. The upcoming phase was designed based on knowledge that was gained from the previous research. This made it possible to adjust the research based on what had recently been learned to make all parts of the methods relevant throughout the project process.

A broad variation of research methods was used to create the final guidelines and concept proposal. The research started with a theoretical research phase, followed by interviews and then user studies. The theoretical research phase was to get a deeper understanding of the subjects of matter and to be prepared for the interviews. The interviews required certain knowledge about the areas beforehand since they were held with experts in the different fields that PQ consists of. The reason for conducting the interviews with the experts was to get a broader perspective on the research. An expert has several years of experience and have already examined and filtered through information similar to the one available through internet research. Therefore, the experts input worked as a way of evaluating the theoretical research. Another contribution from the experts was inspiration and tips about how to conduct the project and mistakes to avoid.

After the theoretical research and market analysis, the user tests were conducted. The participants were all within the target group, which was positive. However, they all worked within the Geely group and thus with cars. It would have been beneficial if it had been possible to conduct the user tests with participants from other occupations to get a more realistic spread. It would also have been more realistic if the user test could have been conducted in an environment more similar to a showroom. The premium design expert recommended to not include users in the design phase when creating a premium product. Therefore, the user tests were not designed to map how the participants would change the design of the interior to make it more premium. Instead the focus was on how they perceived the existing interior which

revealed what they focused on as well as their first impressions. This provided valuable information about how the perceived quality could be increased in the design of the interior.

After the user test, all the information gained from the research phases was gathered, analysed and filtered to create the final guidelines. These guidelines were then evaluated with a poll that was sent to potential users within the target group. More than twice as many participants contributions was included and the occupations varied more compared to the user study. The contributions from the participants who answered the poll were all quite similar. This strengthened the reliability of the result.

The final concept was then created based on the guidelines, they worked as a form of requirements of specification. It would have been interesting to also evaluate how well the final concept aligned with the guidelines in a study with several participants, to see if it aligned more with the guidelines than the existing design of the Lynk & Co 01. Altogether, all the different phases of the project were based on the previous phase which created a strong connection between the research and the final deliverables.

7.2 Findings

The findings from the theoretical research consisted of data from various research articles, providing solid and detailed information regarding relevant areas. The information provided background knowledge and general insight regarding the purpose and research questions of the project. To understand the mechanisms and theory behind to try and reach the answer in the best possible way. For example, the research on human perception, visual appearance and first impression resulted in knowledge on how to further investigate the project purpose.

The market analysis resulted in a lot of interesting and comprehensive insights from experts within relevant fields as well as understanding for the current situation. Furthermore, the insights from the experts validated some of the findings from the theoretical research and deepened the knowledge of the projects purpose. These interviews with expert were key to getting closer to answering the research questions regarding the qualitative impression and perceived premium.

The purpose of the project – to investigate what attributes of the car interior affects the first impression, along with the first research question of what the users look for when entering the vehicle, was the main focus during the user studies. The studies resulted in findings such as a mapping of the first impression, ranking of attributes, observation notes and interview scripts. The mapping was key to observe their behaviour and understand what caught their attention in order to answer these two questions. The interviews provided insights for the reason behind the choices and actions, an understanding on a deeper level. The ranking of attributes provided insights regarding the research questions connected to the qualitative impression and perceived premium. This was a way to not explicit ask the participants direct regarding these two attributes which was favoured and encouraged by the CMF designer.

The poll evaluation of the established guidelines was carried out to gain knowledge and answers to the research question regarding important factors of the car interior when sharing it with others. Moreover, to learn whether there is a difference in comparison to purchase the vehicle

for only personal use. The findings have been supporting the upcoming phases throughout the project, which means that the majority of them are validated in more than one way. This also means that all the findings from the different stages are present to some extent in the final guidelines and concept proposal.

7.3 Concepts and guidelines

The concept was designed to make the interior more in line with the developed guidelines in comparison with the existing design. The concept proposal consists of several changes to the front area of the interior of Lynk & Co model 01, and all the changes were made based on the guidelines that was the result of this projects research phases. The guidelines should be applicable on all vehicles used for car sharing. The design proposal visualises examples of how the guidelines should be interpreted and how they could be applied in the 01 model. Applying the same guidelines to other vehicles would not mean applying the exact same designs since one would have to consider what would be the most harmonious for that specific design. Like the CMF designer stated, it is a matter of finding specific design solutions that are perceived as premium and once it has a premium level, that is something most would agree on and just know that the right level of quality has been achieved.

Stated in the research was that a premium design can be reached through removing as much clutter as possible from the design, in order to make it more minimalistic. The result from the poll investigation showed that the guideline suggesting a clean, minimalistic, coherent and spacious design was most important for the user, which shows that these result of theoretical research and research conducted with users supports each other. Because of these reasons, this guideline received much focus during the creation of the concept proposal.

The qualitative appearance was ranked in second place in the evaluation of the guidelines supporting the findings from the research and interviews with expert, that it is crucial and supporting many of the other guidelines e.g. the perception of premium. Thus, playing an important role in the design proposal. The materials of the concept proposal have been picked to emit a natural and genuine look as stated in the research. Furthermore, the geometry of the front area has been modified and made more harmonious as mentioned by the experts along with a natural shine to materials as well as of the ambient interior light have been added to support this guideline.

Another finding during the theoretical research was that a moderate level of complexity is beneficial to achieve a high level of appeal. Comments made during the user studies indicated the same and the guideline advocating a moderate level of complexity received points in the poll investigation. In the final concept this was applicated through minimizing the amount of controls as well as relocate them to make it easier to interact with and also ease the visual complexity.

7.4 Fulfilment of purpose & research questions

The answer to the research question regarding what the users looks for when entering a vehicle was found during the user studies and are presented as the ninth guideline – drivers' area most significant. It consists of the area around the centerstack, IP, steering wheel, driver's seat, infotainment system and dimmer. These attributes within the area are the ones which attracts the visual attention the most during the first impression.

The key factors for the users when choosing a vehicle for car sharing are the ones with the highest score in the poll, which means the higher the score the more important it is for the purpose of sharing. The most important are to have a clean, minimalistic, coherent & spacious appearance of the interior. Secondly is the qualitative appearance followed by the importance to appear attractive to the senses. Furthermore, perceived premium, level of complexity, convey a message, conscious design choices and inviting & functional lightning.

The fulfilment of the eight listed guidelines will contribute to a more qualitative impression of the car interior and are key factors for the users to perceive the car as premium. The combination of all the guidelines will enhance the quality and perceived premium.

7.5 Future

Future work would be to evaluate if the designed concept proposals aligns more with the guidelines than the existing interior of the Lynk & Co 01. In order to do this, a more detailed prototype needs to be constructed. Preferable thoroughly enough to be able to visualise lights, sound and the visual appearance in detail, also to make the user tests as similar to the ones performed in the project as possible. The concept proposal should then be further developed after the testing with potential users. Iteration is required to reach a final concept that fulfils the guidelines and the needs of the target group.

A recommendation from the CMF designer/premium expert was to visit places the target group visits. Specifically, selecting places with a lot of premium interiors such as fancy hotel lobbies, restaurants and premium department stores. This in order to get inspiration on how a vehicles' interior design could reach a premium perceived quality level in a similar way. If an evaluation of the designed concept shows that a higher level of premium is needed, visiting these places could be a method to get inspiration and tips on how to develop the design so that it would be perceived as more premium. Further the CMF designer stated that the quality of the premium product is just as important as the design of it itself. Therefore, choosing very carefully amongst the manufacturers is highly important. Researching which manufactures would be most suitable for each component should also be a part of the future work. Moreover, if a product starts manufacturing, thorough quality management is crucial.

The process of choosing specific materials will require additional research regarding possible materials for the different components in the interior of the car. The new choices of materials should be lighter to help reduce emissions and fuel consumption as stated in the research section of material quality. Furthermore, materials that are not harmful for humans or the environment is a preferable choice and possible since there is a lot of development in this area according to the attribute leader of sustainable materials. Moreover, since there are lots of new materials

entering the market in terms of recycled textiles, this would be something to look into and investigate further the possibility of implementing these kinds of textiles. When a detailed specification of materials is reached it will need to be tested and evaluated with potential users to ensure it will enhance a qualitative appearance and premium feeling. It will also need to be evaluated whether the chosen materials support the guideline of being perceived as clean, minimalistic and hygienic since this is important according to the poll when sharing the car.

The guidelines and concept proposal contain ambient light sources to support the feeling of spaciousness and to enhance the functionality. As stated in the research section of illumination lights can be used to evoke positive feelings and personalize the experience. Therefore, it is an important aspect to develop when it comes to reaching a design of the car interior that are perceived as premium and qualitative as well as leaves a good first impression. The light needs to be designed carefully with consideration to the functionality of it and the surrounding environment of the interior. As mentioned by the light designer it is all about finding the right colour of the light in connection to the lit surface, for the intended target group. Therefore, it will be important to investigate the light aspects connected to the specific target group and its combability with the surrounding design. Different light settings will need to be tested and evaluated in the same way as the material with potential users. Moreover, both the material and light needs to be evaluated regarding there haptical, visual and audible attributes in order to appeal to these senses since this is one of the guidelines.

7.6 Sustainability

The new design was created to meet the users' needs – it was designed with a human centric perspective since that was established in the research phase to be important. When a design has high usability one can assume that people will use it for a longer time since they at least will not throw it away because they do not like the functionality of the product. If the human centric design approach could lead to a vehicle with high usability that would be appealing for a longer time to its users, that would be beneficial from an environmental sustainability perspective since the demand for new products would decrease and so the number of manufactured cars.

With the new design, there would be less parts to manufacture for the IP since there should be less different surfaces and therefore also less parts for a more coherent and minimalistic appearance. Depending on the manufacturing techniques, this could be a good alternative since it could create an opportunity to use less moulds and tools etc. Moreover, the complexity of the geometrical forms has been reduced since there are lot less curves and complex intersections, which will improve the manufacturing set up.

From an environmental sustainability perspective, human health perspective and ethical point of view are the choice of materials crucial. The guidelines suggest that design choices should be consciously made and that the design should convey a message. This opens for the possibility to create designs that aligns with the guidelines, are sustainable both ethically and environmentally and conveys a message that they are doing so. Furthermore, the decrease in number of materials will also be beneficial for a manufacturing perspective and environmental aspect. Along with better material choice that has a lower environmental impact due to being made from recycled or lighter materials.

There is also the concept of car sharing itself which supports both the environmental and social sustainability. It means that if the design of the car interior offers a good first impression and appeal to the target group, would probably increase the usage of sharing service rather than individual owning. It would decrease the number of vehicles in urban areas and make room for other more social activities and institutions. Furthermore, since the car sharing company is responsible for the maintenance of the vehicles, there would probably be serviced regularly and at the end of its lifecycle be recycled or reused in the best possible way. Since less vehicle would have to be manufactured, the amount of required material would be reduced. This would further decrease the amount of transportations required to ship materials and finished products from factory to customer, along with the waste from both the manufacturing and dismantle after use.

8

Conclusion

The project work has been extensive and included a lot of different and variating methods in order to investigate and find the answers to the project's purpose and research questions. The purpose – to investigate which attributes in the interior of a car it is that affects the users first impression of it has been identified through the user studies with participants within the target group. Also, the first research question regarding what the users look for when entering a vehicle was identified through the observations and first impression journey mapping during the user studies. The results for these two were compiled in the section of the results from the mapping of the guidelines, were one of the identified areas was the most significant aspects of the driver's area. This area is what caught the user's attention when entering the vehicle and affecting the qualitative impression of the interior. Thus, fulfilling the purpose and research question. This driver's area was used as focus area for the visualisation of the eight guidelines in the concept proposal, since these are key for the first impression and to attract attention.

The eight guidelines present the factors which contributes to the qualitative impression. The guidelines are presented in the order of how they were valued in the poll that was sent out. The ones that have a higher placement received more votes in the poll and can therefore be considered the key factors for the users to perceive the car as premium and when choosing a vehicle for car sharing, fleet service or taxi usage. The most important guidelines were *clean, minimalistic, coherent & spacious* and the second and third most important were *qualitative appearance* and *attractive to senses.* Meaning that these three are key factors when designing the interior for sharing the vehicle with others and create a sense of premium.

The conclusion is that the purpose and all the research questions have been answered through the theoretical research, market analysis, user studies and evaluation. All of the results from each question are present in the guidelines and concept proposal.

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Appendix

Appendix 1.

Interview

Car Dealers

Brand:

Is it OK to take pictures and publish them?

☐ YES

☐ NO

Car Dealer interview

- What are the most common questions buyers asks about the interior?
- Which are the most common add-ons buyers purchases for the car interior?
- What is the most common complaint regarding the car interior?
- If a customer is choosing between two models, what are the determining factors in most cases?
- Which are the most appreciated features in the car interior among the customers?
    - Materials
    - Illumination
    - Colors/Surface finish
- How are the cars displayed in the showroom?
- How do people interact with the car? Please describe the most common things people do (start the engine, test the lights etc.)
- Which models of X are perceived as most premium and most common?
  (Audi, Volvo, Mercedes, Mini Cooper & BMW)

Appendix 2.

Interview
Light Designer &
Car Illumination Expert

Profession:

Work experience:

Process analysis pt. 1

The purpose of this is to provide an overview of the tasks that should be taken into consideration for achieving a good quality working process and result when designing lights. Briefly describe the process from start to finish in about five to eight steps. *[levels, distribution, shadows, reflections, glare, color light & surface, temperature*]

1.

2.

3.

4.

5.

Process analysis pt. 2

The purpose of this is to provide a detailed understanding of key factors in the process, how they should be performed and what mistakes should be avoided.

- What are the key factors in the process of designing lights?
- What are the mayor elements you must know and keep track of during the light designing process?
- Important mistakes to avoid when designing light?
- Do you include users in the design process?
  - If yes, how?
- What methods do you use to find what suits the different users?

Detailed knowledge

The purpose of the this is to provide details and examples of cognitive elements of expertise when it comes to designing lights. [Literature tip?]

- What distinguishes good lighting from bad lighting? Any specific characteristics? Any specific attribute (color, material etc.)?
- Can you give an example of what is important in the big picture for light design?
- How are the different types of light (ambient, task, accent) structured when designing a complex artefact such as a car?
- How do you evaluate if the lights are well designed?
- Important factors to consider for ambient/task/accent lighting in cars?
- Efficient ways to use light to achieve a premium feeling?
- Efficient ways to use light to draw attention to certain features?
- What are mistakes to avoid in the design of light?

Trend analysis

The purpose of this analysis is to provide guidelines for current and upcoming trends within lights.

- Where are the trends heading within light design (specifically for cars)?
- Is the trend coherent regardless of which type of product the light is a part of, or does it differ between different segments?
- Are the lights in focus e.g. aesthetics feature or in the background and more functional?
- Trends regarding the mounting and placement?

Interview

Premium Designer

Profession:

Work experience:

Process analysis pt. 1

The purpose of this is to provide an overview of the tasks that should be taken into consideration for achieving a good quality working process and a premium result. Briefly describe the process from start to finish in about five to eight steps.

1.

2.

3.

4.

5.

Process analysis pt. 2

The purpose of this is to provide a detailed understanding of key factors in the process, how they should be performed and what mistakes should be avoided.

- What are the key factors in the process of design premium?
- What are the mayor elements you must know and keep track of during the premium design process?
- Important mistakes to avoid when designing premium?
- Do you include users in the design process?
  - If yes, how?
- What methods do you use to find what suits the different users?

Detailed knowledge

The purpose of the this is to provide details and examples of cognitive elements of expertise when it comes to designing for perceived quality and premium. [Literature tip?]

- What distinguishes premium from ordinary when it comes to design? Any specific characteristics? Any specific attribute (color, light, material etc.)?
- Can you give an example of what is important in the big picture for a premium design?
- Is the big picture or details in focus when designing premium?
- How do you evaluate if something is perceived as premium?
- Which human senses do you focus on when designing premium?

Trend analysis

The purpose of this analysis is to provide guidelines for current and upcoming trends within premium design. [Evaluate pictures of car and pin-point premium features]

- Where are the trends heading within premium design (specifically for cars)?
- Is the trend coherent regardless of which type of product, or does it differ between different segments?

Interview

Attribute leader sustainable materials

& Attribute leader material

Profession:

Work experience:

Process analysis pt. 1

The purpose of this is to provide an overview of the tasks that should be taken into consideration for achieving a good quality working process and result working with materials. Briefly describe the process from start to finish in about five to eight steps.

1.

2.

3.

4.

5.

Process analysis pt. 2

The purpose of this is to provide a detailed understanding of key factors in the process, how they should be performed and what mistakes should be avoided.

- What are the key factors in the process of working with materials?

- What are the mayor elements you must know and keep track of during the material process?
- Important mistakes to avoid when working with material?
- Do you include users in the process?
    - If yes, how?
- What methods do you use to find what suits the different users?

Detailed knowledge

The purpose of the this is to provide details and examples of cognitive elements of expertise when it comes to choosing materials for the car interior. [Literature tip?]

- What distinguishes high quality materials from low quality materials? Any specific properties?
- How do you work with the composition of different materials in the car interior?
- How do you evaluate that it is the right material for a specific setting?
- Important factors to consider when choosing materials for the car interior? (sustainability?)
- Efficient ways to use materials to achieve a premium feeling?
- Efficient ways to use materials to draw attention to certain features?
- What are mistakes to avoid when choosing materials?
- Which are the most common materials you work with? Why these?
- In what way are materials important for PQ? Literature tip?

Trend analysis

The purpose of this analysis is to provide guidelines for current and upcoming trends within material design.

- Where are the trends heading within material design (specifically for cars)?
- Is the trend coherent regardless of which type of product the material is a part of, or does it differ between different segments? (e.g. interior)
- Is the material in focus e.g. aesthetics feature or in the background and more functional?
- Trends regarding the composition of different materials?
- Are there any trending materials that are more sustainable than the ones used today?

Appendix 3.

COLOUR	PLACEMENT	REASON
		
		
		
		
		
		
		
		
		
		
		

Appendix 4.

Walk Around – look, listen and feel

Participant:

Lynk & co

First impression

- Open the car and tell us what the first thing that comes to your mind
- What caught your eye?
    - Why?
    - What are your thoughts about it? (positive or negative)

Task

- We would like you to mark that which catches your eye with a blue post-it, the post-it's are numbered so place them in the order of which it attracts your attention.
- Mark that which you liked the most with a green post-it, please specify by writing a caption on the post-it.
- Mark that which you disliked using a red post-it, please specify by writing a caption on the post-it.

Follow up questions on a scale (1-10)

- How inviting and welcoming do you perceive the interior as?

  What is the cause of this? (because of detail or overall impression)

- How innovative do you perceive the interior?

  What is the cause of this?

- How high quality do you perceive the interior?

  What is the cause of this?

- How balanced and matching do you perceive the interior?

  What is the cause of this?

- How simplistic and minimalistic do you perceive the interior?

  What is the cause of this?

Audi e-tron

First impression

- Open the car and tell us what the first thing that comes to your mind

- What caught your eye?

  - Why?

  - What are your thoughts about it? (positive or negative)

Task

- We would like you to mark that which catches your eye with a blue post-it, the post-it's are numbered so place them in the order of which it attracts your attention.
- Mark that which you liked the most with a green post-it, please specify by writing a caption on the post-it.
- Mark that which you disliked using a red post-it, please specify by writing a caption on the post-it.

Follow up questions (1-10)

- How inviting and welcoming do you perceive the interior as?

  What is the cause of this? (because of detail or overall impression)

- How innovative do you perceive the interior?

  What is the cause of this?

- How high quality do you perceive the interior?

  What is the cause of this?

- How balanced and matching do you perceive the interior?

  What is the cause of this?

- How simplistic and minimalistic do you perceive the interior?

  What is the cause of this?

Interview with test users

- Which car would you choose based on your perception of the interior? (why)
- Is anything bothering you in the interior? (how and why)
- Which three features in the interior are most important for your choice of vehicle?
- How do you perceive the colours? (is there anything you would like to change?)
- How do you perceive the lights of the interior? (is there anything you would like to change?)
- How do you perceive the materials? (is there anything you would like to change?)

Appendix 5. First Impression Lynk & Co

First look=5p, Second look= 4p, Third look=3p, Fourth look=2p, Fifth look=1p

Design attribute	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**	**P11**	**P12**	**P13**	**TOTAL**
Steering Wheel	5	1			5	4	3	5	2	4	2	1	3	35
Infotainment system	4	5			1	2		4	5	5	3	5		34
Dimmer	3					3		1			1	2		10
Gearshift module	2				3			2	4			4		15
Driver's seat	1		5	4		5	4		3		4	3		29
Side mirror		2												2
Red stitching		4												4
Patterned trim-surface		3	4		4									11
IP & infotainment				5										5
Centerstack				3		1			1	3			4	12
Driver seat viewed from rear seat			3	2										5
AC					2					2				4
Logo on steering wheel										1				1
Ingress							5				5			10
Right doorframe				1			2							3
Door (close to window)													5	5
Handle on door								3					2	5
Backseat													1	1

Green post-it Like		Orange post-it Dislike	
Design attribute	**Nr of post-its**	**Design attribute**	**Nr of post-its**
Steering Wheel	5	Trim-detail	6
Logo on steering wheel	1	Not spacious	1
Infotainment system	8	Seats	3
Dimmer	4	Floor in front of seat	1
Dark colour material	1	Surface on the left side of the steering wheel	2
Centerstack	2	Buttons on left side of the steering wheel	1
Driver's seat	6	AC	5
Driver seat viewed from rear seat	1	Chrome around AC	5
Driver's seat front	1	Gearshift	2
Light in sealing rear door	1	Centerstack	1
Charging module rear seat	1	Charging module in the rear seat	1
Sunroof	1	Seat adjustment control	1
Gearshift module	1	Backside of the driver's seat	1
Chrome details on door handle	1	Ceiling	1
Pockets on the side of the seats	1	Red stitching	1
Door	1	Chrome detail steering wheel	1
Ingress	1	Handle	1
		Piano finish	1
		Frame around dimmer	1
		Infotainment	3
		Steering wheel	1
		Dimmer	1
		Groove in lid on centerstack	1
		Speakers in doors	1
		A-pillar	1
		Airbag surface	1
		Ingress	1

Appendix 6. First Impression Audi

First look=5p, Second look= 4p, Third look=3p, Fourth look=2p, Fifth look=1p

Design attribute	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**	**P7**	**P8**	**P9**	**P10**	**P11**	**P12**	**P13**	**TOTAL**
Steering Wheel	5			5	4	2	2	5		2				25
Infotainment system both displays	1	2	3		5		1	3		5	1		3	24
Dimmer	2							4		1	4			11
Gearshift module	3				1			2	4		2		2	14
Driver's seat		3					5		2				1	11
Side mirror camera	4	5	4	4	3	4		1	5	4		5	5	44
Centerstack				2										2
E-tron light door						5			3			4	4	16
Upper infotainment display				3		3								6
Alcantara material door					2									2
Ambient light lists			5	1										6
Ambient light list centerstack									1	3				4
Speakers			2											2
Black reflective surface on IP		4												4
Ambient light seatbelt		1												1
Passenger side													2	2
Backseat													1	1
IP												3		3
Ingress/space											5			5
Rear-view mirror							3				3			6
Floor							4							4

Green post-it Like		Orange post-it Dislike	
Design attribute	**Nr of post-its**	**Design attribute**	**Nr of post-its**
E-tron light door	1	Two infotainment displays	3
AC	1	Hole/gap in centerstack	4
Infotainment system	5	Cap above dimmer	1
All black interior	1	Gearshift module	3
Ambient light	7	Lower infotainment display	2
Side mirror camera	3	Mirror camera display	1
Speakers	2	Driver's seat	3
Driver's seat	1	Surface on left side of steering wheel	1
Alcantara material	1	Door handle inside	2
Dimmer	3	High gloss pianolack	3
Steering wheel	2	Infotainment displays	2
Material door	1	Ventilation mechanics	1
Centerstack	1	Headrests	1
E-tron emblem on IP list passenger side	2	Rear seat display	1
IP	2	Ambient lightning	1
Surface on the left side of the steering wheel	1	Material inside door	1
Gearshift module	2	Chrome details	1
Door	1	Steering wheel	3
Corner of door that goes up	1	Pedal support	1
Camera display	1	Handspike left to steering wheel	1
Ingress space	1	Rear-view mirrors	1
Buttons in overhead console	1	Armrest in centerstack	1
		Windshield	1
		IP	1
		Floor	1

FIRST IMPRESSION

LYNK & CO

Tittar på instrumentbrädan, det man ser som förare när man sätter sig i bilen.

Väldigt sportig med de röda sömmarna. Lite sportig med det röda.
Röda/svarta färgkombinationen förknippas med gaming stolar.
Röda sömmar och sköna säten. Sätena ger bra första intryck.

Känns trångt, kanske det är högt upp. Jag behöver trycka ihop mig men samtidigt mysigt och ombonat. Kändes mindre när jag kom in i den, ser inget framåt.
Spontant känns det lite trångt. Lite högt insteg. Känns som man har mycket plats

Skärmen lyste upp och spelade en liten välkomstfilm - trevligt. Skärmen drar igång.
Det första man såg var skärmsläckaren som startade på displayen. Det var snyggt och oväntat.
Att skärmen lyser upp. Stor skärm, inga kanppar. Ser bra ut. Skärmen fångade blicken.

The interior was full of stuff, textures, different materials.
Mycket krom. Väldigt mycket detaljer, lite för mycket för min smak.
Plottrig, mycket som händer. Plastiga detaljer på konsolen.

”Oj vad var det? Okej det låter jättekonstigt i dörren. Det måste vara det här handtaget”. Ganska kass ljud vid dörröppning.
Ljudet från handtaget lät plastigt.

Looks at materials and surfaces. Stilren och enkelt.
Den har väldigt rena ytor som ej blänker. Fräsch ej smutsig.
Inbjudande att sätta sig i.Tänker mer på material och hur det känns

Väldigt svart, känns lyxigt.
It feels quite dark inside, does not like it.
It feels muscular and thick.

Loggan står ut. Schysst ratt. Ratten.
Ratten - loggan. Väldigt fin pga kromloggan.
Kollar på ratten automatiskt, ratten ser bra ut och rejäl.

Känns redan lite gammaldags men som en vanlig bil.
Omodernt.

FIRST IMPRESSION

AUDI

Sätena ser sköna ut.

"Oj det var en kamera där". Looks at the cameradisplay, uncommon. High-tech känsla med display och kamera.
Upptäckte kameradisplayen. "Oj den här var spännande" (kameradisplayen) Digitala backspeglar. Backspegelar.
Kameran är cool. "Gillar att de valt att gå på något ingen annan, förutom Porsche tror jag har gjort". Backspegeln.
Backspeglarna känns konstiga. Varför tänds dem nu? Borde starta först när man stänger dörren och sitter i
och har startat bilen. "Jäklar vad är det här" (kameradisplay). Kameran hamnar lågt men kan vara en vanesak.

Mittkonsolen (p-knappen) gör att man blir nyfiken
och undrar hur det fungerar.

Ögonen dras till det som aktiveras och lyser upp - skärm och backspeglar.
Känner sig välkommen in i bilen.

Ser e-tron lampan i marken. Belysningen mycket bättre än Lynk & Co
e-tron lampan som lyser på marken. "Oh lysande säkerhetsbälten"
Looks at the e-tron light on the ground, it is interesting and like it.
Lampan drog fokus till dörren istället för att titta på det "vanliga"
ex föraområdet. Egentligen lite töntigt med e-tron ljuset.
Kollar på allt som lyser, coolt med belysningen.
Mycket som händer och mycket som lyser.

Doftar ny bil.

Första tanken är att det är mycket skrämar, de fångar. Den har två skärmar tror jag.
Tittar inte så mycket på displayerna men lägger märke till den, inte intresserad, tänker
att det kommer bli smutsigt på blanka ytor och skärmar, gillar inte de blanka ytorna.
Som ett flygplan, blir mycket med belysningen och skrämar.

Ratten fångar blicken, sticker ut.
Materialet på ratten är samma som Lynk & Co, ser bra ut.
Förutom ratten, och loggan på ratten som också fångar ögat.

Känns väldigt hårt på något sätt.
Det här känns mer kvalitet direkt. Det här är future och lyxig bil. Lite hårdare i sin stil. Kaxig.
Känns som det händer mycket, det var mycket som fångade blicken. Mer modernt och innoativt.

Var väldigt annorlunda, platt och rak. Helt annan design
vid golv och insteg. Trevligar ljud vid dörröppning. Känns rymlig.
Tittar snabbt om jag kommer få plats. Tittar på föraområdet.
Fräck instrumentpanel, sportig. Det ser ut som en keps över dimmern.

Alcantaran ger ett gammalt intryck.
Morfars bil hade kunnat se ut såhär när man var liten.
Nytt med alcantaran, ej bekant med materialet.

It is very dark in the interior, feels like Star Wars (which is positive).
There are clean lines and following curves. Gillar Audin bättre färgmässigt.
"Okej den här var ännu svartare (än Lynk & Co).

Appendix 9.

INVITING & WELCOMING

LYNK & CO

Är som en vanlig bil, inget som utmärker sig i dess design.
Ser ganska modern ut, go ut att köra, rejäl och robust.

Stolen hade kunnat vara mjukare och sittytan lägre.
Stolarna ser sköna ut, men jobbiga vid lång resa.
Formen på ryggstödet i framsätet är inbjudande.
Hade kunnat hoppa in och sitta länge, bekväm.
Sätet ser skönt ut och man vill kliva in och sätta sig.
Sätet känns inbjudande. Comfy seat thanks to padding.

Färgen svart gör att man inte är orolig att smutsa ner.
Känns lite aggressiv och farlig, med den här svarta färgen.
Even if the colour is quite dark, it is everywhere so there is consistency.

Välkomstvideo på skärmarna. ”Displayen drar in mig”
Skärmen är riktad mot föraren vilket känns välkommande.

Stor öppning men tröskeln är så hög att man tänker att det är jobbigt. Mycket som händer med mycket detaljer så det upplevs tajt. En clean design hade nog varit mer inbjudande. Det känns lätt att sätta sig. Mycket yta, inga problem.
Stort, roominess, luftigt man vill sätta sig men det ser stökigt ut.
Men balken går åt vänster, vilket gör att det känns inträngt.
Kändes lite trångt men mysigt.

Appendix 10.

INVITING & WELCOMING

AUDI

Nice men hårade med linjerna. Formen är kantig.
Den är också kantig och kaxig i sin stil. Känns hård.
Ej inbjudande pga antalet skärmar, händer mycket samt upplever kanterna som hårda.

Armstödet var negativt.

Materialet, alcantara är mjukare.

Känns lite mer öppen - spacious. Bra utrymme.
Öppningen känns större än Lynk & Co.
Dörren är fasad, vilket ger en känsla av rymlighet.
Den ser rymlig ut. Som en grotta man kryper in i.
Feels like I have more space. Mycket utrymme.

Vill ha det mer mysigt. Inte supervälkomnande.
Skärmarna lyste inte och lockade ej in. Inte så mysig.
Blanka och svarta ytor är ej välkomnande. Lite för cool.

Quite nice due to the dark colour everywhere.

Mycket som händer och lyser upp, mycket intryck får man, känner mig ändå välkomnad.
Något som drar ner är att det upplevs mycket när allt tänds. Gjorde mycket att dimmern tändes.

Händer inte så mycket. Mycket cleanare, tror det har stor betydelse.
Känns lite jobbigare än Lynk & Co. Lite bulky.

Bekvämt att sätta sig. Mjuka och bulkiga säten. Sköna säten.
Högt säte och det har ett trögt material (alcantar). Känns trevlig men sätet känns inte lika skönt att sätta sig i.

Appendix 11.

INNOVATIVE

LYNK & CO

Ser inget nytt i bilen, allt man ser har man sett innan. Inte mycket som är innovativt.
Solutions from cars decades ago, except the screen. Nothing special otherwise.
Känns som en typisk bil, inget speciellt. Inte jättemycket, inget nytt, vanlig bil.
Ej banbrytande utan ganska nutida. Fortfarande en vanlig bil, inget wow.
Inget som sticker ut jämfört med någon annan, som man förväntar sig, varken mer eller mindre. Inte så nyskapande, känns som dagens bilar.

Det känns som att de har övertänkt designen pga ex randigt & mönster på yta i dörren, mycket inknuffat och mycket små detaljer.

Bara skärmarna som är innovativa, känns nytt och fräscht.
Allt annat har man sett förut. Men skärmen drar upp betyget.
Skärmen och växelspaken kändes innovativa annars ganska traditionell med kanppar. Skärmarna kanske är för sin tid.
Dimmern är det som är mest innovativt i förarmiljön.

Inte så mycket som är unikt men nice med trådlös laddning,
sett det mesta innan men den mörka stilen känns innovativ.

Känns lite out of date

Appendix 12.

INNOVATIVE

AUDI

Tänkt till med lampor, skärmar och lagom med antal knappar.

Växelspaken är innovativ och känns bra, även så backspeglarna (kameran).

Fler detaljer som inte ”vanliga! bilar har. Fler skärmar, digitala backspeglar, formerna (i förarområdet/instrumentpanelen) är futuristiska och lite rymdskepp över det. Färre reglage än Lynk & Co. Känns bättre än Lynk & Co.

Känns mer innovativ än Lynk & Co, de har tagit det steget längre med ljusdetaljer, förlängd skärm och många nya element.

Riktigt bra. Mycket nya grejer men inte 10 för det är inget revolutionerande.

Ganska högt ändå. De har ändå inte gjort något jätterevolutionerande, de var inte först ut. Traditionell bil.

Kameran, spaken, helheten med belysningen, säkerhetsbälten, panelen, två skärmar, dimmern men fortfarande ganska standard.

Two screens and cameras, apart from that it is a normal car.

Överanvänt belysningen, försöker för mycket.

E-tron lampan och backspegel inte så snyggt. layouten vid fläktarna. Växelspaken är coskå ganska annorlunda.

Försökt göra något nytt, endast fokuserat på att göra något nytt men fungerar det för alla är frågan.

Blir splittrad, två skärmar och backspegel ger höga poäng men material och hårda kanter känns 90-tal.

Appendix 13.

QUALITY

LYNK & CO

Trim-ytan drar ner betyget. Det som sticker ut är fläktarna och trim-ytan. Sätet ser nedsuttet ut, lädret ser gammalt ut. Gillar inte plastmötet på vänster sida om ratten mot förardörren.

Ej plastig känsla.
Materialvalen, plasten och ratten hade kunnat förhöjas med andra material. Ser gediget ut i materialet. Litar på att det ska fungerar. Inget wow. Hade kunnat se mer lyxigt ut. Känns välgjort och ser inga brister.

Överlag känns den bra. Schyssta material, känns bra att ta i och sitta på. Ytskikten ser fräscha och fina ut, långsiktighet i hur det fungerar över tid därmed svårt att bedöma.

Robust och rejäl, ger ett kvalitativt intryck. Der ser enhetligt ut. Känns dyr och välarbetad. För mig innebär kvalité lite mer stilrent och snyggt. Bra kvalitet på bilen.

Not high, but medium. Lines are not matching, feels clumsy. Gaps and an unfinished feeling. It is the small details that contributes to the perception of the quality.

Väldigt blandat. Vissa detaljer mycket bra och så förstör man genom att ha något fult bredvid. Vissa plastdetaljer och kromdetaljer drar ner.

Man har försökt men inte lyckats hela vägen.

Först hög (7) men ju mer man tittar så går det ner (5), går ner hela tiden.

Appendix 14.

QUALITY

AUDI

Pianolack känns fattigt - man ser allt, små skavanker det kräver att ytan är perfekt.
De blanka ytorna känns kladdiga. Pianolack drar ner ser plastigt ut, gillar det inte.

Känns bra, tysk kvalitet som Audi - mental modell sedan innan.
Lynk är ju nytt brand. Varumärket spelar in. Audi gör bra bilar.
Har en tidifare erfarenhet av att Audi har hög kvalitet och tänker att det är tysk ingenjörskonst. Man vet att märket är bra - Audi.

Mycket bra.

Jo den känns kvalitet, den har Bang Olufsen högtalare, allt är slätt och fint. Vet inte vad som skulle dra ner det.

Kan inte bestämma mig gällande kvaliteten på stolen.
Ratten drar ner betyget, känns billig den är inte mjuk.
Premiumbilar brukar ha biffigare, den känns tunn.
Kan inte bestämma mig gällande kvaliteten på stolen.

Den har hög kvalitet men lite brister, ex samlar smuts. Välgjord, high tech features, materialval och detaljerna ger intryck av bra kvalitet.
Mycket ny teknik med belysningen, skärmar och kameror , kommer allt samarbeta?

Lite plastkänsla vid reglagesidan av stolen, mer arbetat i mitten av bilen - centerstack.
Except the more common plastic material in the door, the material deels quite expensive and thick. Platspartierna och att dessa känns tråkiga.
Känns bra. Lite plastigt vid sidan av stolen.

Har inte de plastiga detaljerna som Lynk & Co så högre kvalitet än den.
Känns som bra material, ser ej plastig ut, flashig.

Appendix 15.

BALANCED & MATCHING

LYNK & CO

Det röda (orange) går igenom överallt, ja balanserad får man säga.
Färgmässigt fungerar det röda, är genomgående.

Finns en balans. Kromen återkommer. Behagligt att titta på. Inte så mycket färg. Det röda återkommer. Svårt att säga att något skulle vara perfekt, kan alltid bli bättre.

Kromdetaljerna lyfter upp det gråa, bra balans mellan metallen och de gråa plastpartierna. Sömmarna hjälper till och matchar trim-detaljerna.
De röda detaljerna förstör, passar inte ihop riktigt men bortsett från det bra.
Bra förutom mönstret på trim-ytan.

It follows the same patterns and designs.
Det är återkommande former och kurvor. Enhetligt.
Ser inget som sticker ut, formerna kommer igen och genomgående liknande material.

Beige tak går inte ihop med det svart/röda temat, bilen är tvådelad.
Splittrad, en annan designer som gjort taket.
Racing-känsla i sätena vilket krockar med centerstack. Bilen ser ut som en racerbil inuti men är en familjebil.
Stökigt, mycket grejer som att en jobbade på dörren och en annan på taket utan att de pratade med varandra.
Inte så matchande. Mycket färg, material och delningslinjer. Visserligen enhetligt men fortfarande mycket.
Lite rörig, lika aspekter - AC och infotainment är bra men mycket olia material.
”Harmonisk? Nej verkligen inte. För mycket som händer. För mycket färger/nyanser.

Appendix 16.

BALANCED & MATCHING

AUDI

Ganska mycket blandade material och blandade former. Inte skandinavisk design.
Materialfinishen är väldigt varierande och lite spretig.
Klaschar lite i materialmöte men annars bra.

Samtidigt har de färre material - sätet två och ratten ett.
The materials are consistent.

Blänket störande vid e-tron emblem.
För mycket blanka ytor.

Färgmässigt matchad.
Bra balans. Hela interiören är mörk men materialen glänser på olika sätt.
Exteriör och interiör matchar i färgerna, vilket ger en snygg balans. Den svarta pianolack, krom och det gråa är ett lagom antal färger och material. Känns enhetligt.

För mycket svart.
Ganska välmatchad, kanske lite mörk.
Väldigt mörk så på så sätt matchad.

Mer stilen som rör till det, blir konfunderad. Nej, smackat på det mesta de kan hitta.
Känns som en del är futuristiskt, men sen gammalt armstöd och säten, de passar inte in.
Nytänkt och futuristisk känsla är genomgående i hela bilen, dem gör det bra.

Olika knappar stör, mittparti gentemot dörren.
Inte så balanserad då det är mycket hack och nivåer.

Feels balanced. Shapes follows the same curves everywhere.
Inga problem att somna om man sitter där bak under längre resor. Stör att lamporna i dörren inte går hela vägen ut.

Appendix 17.

SIMPLISTIC & MINIMALISTIC

LYNK & CO

Inte alldeles för mycket knappar, ser tydligt vad allt är, rimlig mängd knappar och reglage.

Clean, inte massa onödiga knappar, händer kanske lite mycket vid ratten.
Baksätet får full pott.

Finns färg och mönster, beror på vad man lägger in i begreppet.

Inte alls.

Samma anledning som balans.

Nej det är den inte i jämförelse med Tesla. Tycker det är mycket reglage och trim-detaljerna gör den mindre minimalistisk.

Relativt clean. Rena ytor. Anledningen till att den inte får högre betyg är att det finns en hel del knappar och reglage.

Ratten, knappar och dimmern gör att det ej känns minimalistiskt.

Finns fläktar och så. Mycket som händer som hade kunnat vara mer nedtonat. Många former, vilket dock är vad jag förväntar mig av en bil. Hade velta ha mer modernt och ännu mer cleant.

”Jag vet inte om jag tycker att den är så minimalistisk”. Det händer mycket överallt. Hade kunnat ta bort det ljusgråaa i dörren för att få mer minimalistisk känsla.

Den är lite rörig. Inte så minimalistisk egentligen. Detaljerna som trim-ytan gör att den känns flashig. Hade önskat minimera antalet komponenter och slå samman saker. Inte skandinaviskt stilrent.

Det händer väldigt mycket, många kanter, former och kurvor. Det händer för mycket, många former samt linjer som går in i varandra och på varandra.

Not minimalistic at all due to different materials, gaps, stitching and a lot of variating things.

Appendix 18.

SIMPLISTIC & MINIMALISTIC

AUDI

Simpel. Man förstår vad knapparna gör men det är mycket info, displayer, kamera och ny typ av växelspak. Den känns digital och uppkopplad.

Passagerarsidan är ganska minimalistisk. Väldigt enkel, inga detaljer/utsmyckningar.

Inte för mycket knappar, vet vad man ska göra och interagera med.

Pga småsaker, första anblick var att det var få reglage men sen är det ändå en del i dörrar och spakarna, två skärmar. Modernt med skärmar men det blir mindre minimalistiskt. Tycker den känns i balans i färger och material.

Jätteavancerad, mycket text, är livrädd finns för mycket saker (spakar, skärmar etc.)

Vet ej om det är bra eller dåligt, behöver man alla de här prylarna? Känns lite onödigt.

Det händer mycket, när displayen tänds kommer det hända ännu mer. Formerna är spetsiga vilket gör att de poppar mer. Kromdetaljerna är tunna/smala gör också att det poppar mer. På förarsidan händer det mycket, inte så minimalistisk.

Mindre minimalistisk än andra Audi-modeller. Händer ganska mycket i den.

Super high-tech. Ger tvärtemot minimalistiskt intryck. Den är mer high-tech och modern än minimalistisk. Det händer för mycket i mittkonsolen.

High score thanks to the consistency in the lines, however, there are still a lot of stuff going on in the interior. Lampor/knappar/skärmar överallt som sticker ut.

För mig innebär det väldigt slätt, färgerna bidrar till det cleana. Minimalistiskt i en bil för mig är Tesla - slätt, rakt, inga knappar och en skärm. Här är det knappar, reglage osv blandat med haptiskt.

WHICH CAR WOULD YOU CHOOSE?

ANYTHING BOTHERING YOU?

Välja Audin, känns ny men skrämmande samtidigt, men har mer helhetskvalitet och uttänkt. Valt Audi pga helsvart interiör.
Audin – helhetsintryck, mer genomtänkt, en genomarbetad interiör med-för känslan att den är mer genomarbetad under huven.
Audi. Faller mer i smaken utseendemässigt. Mer high tech och påkostad.
Väljer först Audi, blir osäker och ändrar till Lynk pga skärm och mittpanel men på Audin gillas material, ytskikt, finesser (lampor, Bang Olufsen högtalare, lampor i säkerhetsbälte, växelspak), gillar även space/rymlighet i Audin så eftersom den har flest positiva aspekter väljs den tillslut.
Skulle välja Audi pga helhetsintryck. Lynk & Co känns sämre kvalitet. Audin har skandinaviska drag som gillas. Gillar dock sätena i Lynk & Co.
Audin känns fräschare och nytt i Lynk&Co finns det inget nytt man har sett allt innan.
Audin känns mer innovativ. Ger ett mer modernt, digitalt och kopplat intryck. Och rymligare.
Chooses Audi. More sporty feeling, due to material, shapes and low seats. Likes it.
Lynk är lite billig jämfört med Audi som känns mer genomarbetad och premium, väljer Audin.
Lynk har snyggare design men kvalitén känns mkt bättre i Audin. Hade därför valt Audin.

Designen på ratten i båda bilarna, Lynk – för liten och matchar ej resten av bilen. Audi bra storlek men spakarna matchar ej futuristiska temat.

Audi – dubbla skärmar och stora hålet. Audi – två skärmar istället för en stor och ratten.
Audin – gillar inte dubbeldispalyerna och att de har olika vinklar. Känns krångligt.
Audi – för flashig, Audi - Skärmen för kameran på vänstersidan är för nära.

Lynk - söm i helt annat färg Lynk - röda trådar Lynk - röda sömmar
Lynk – röd/svarta detaljerna, racingfeature i en familjebil 40-plus varning.

Lynk & co – mycket som händer. För mycket knappar, krom, mönster och allt
Lynk – hexagonmönstret Lynk – plottriga, trim-detaljer Lynk – trim-detaljerna. vad det är.
Lynk & Co – de röda hexagonformerna stör intrycket. Ej enhetligt.

Lynk - svårt att sätta fingret på det men känns nyare och fräschare och mer inbjudande.
Skulle välja Lynk & Co. Kändes mer inbjudande att sitta i. Audin är något min pappa skulle ha, mer manlig och sportig.

Backspegeldisplayerna på Audi, de ligger fel

Audi – the cheap material.
Lynk - de enklare materialvalen.
Lynk & Co - Materials and shapes are cut off.

Inte designat för alla förare i båda, och Lynk – pga smalt säte.
Lynk - växelspaken, mellanstorlek skulle behöva göra den större eller mindre.
Lynk & co – plastdetaljerna mot växelspaken Lynk - växelspaken. Audi – stor växelspak.

Audi – blanka ytor och svarta ytor.
Pianoblack kanske är nice när det är mörkt men på dagen syns blänk och smuts.
Audi – högglansigt material inte fint, inte premium.

Blev lite opersonligt när det blev så futuristiskt och minimalistiskt. Hade behövt Lynk & Co's välkomstfilm.
Små grejer på båda. Behöver leta efter negativa aspekter. Inget som påverkar helheten. Audi – sätena och armstödet.
Audi – skrämmer mkt, riktad mot prylfixerad 50 årig man som vill visa att han är inne och med.

Lynk – placering av lampor är lite här och där,
Lynk & Co – light and lines and are not following through.

COLOUR MATERIAL ILLUMINATION

LYNK&CO AND AUDI

Bra generellt. Mörk interiör är nice. Bättre i Audi. Audi – mer komplett.
Lynk känns mörk men Audi känns ännu mörkare, dock rymligare. Gillar färgarna, att det är mörkt och svart känns tufft. Mer modernt med svart än grå-dassigt. Gillar det svarta.
Both are quite dark. No stitching in Audi, it is more simple and clean. Like the piano lack.
Generellt mer medvetna färgval/utstickande färgval i Audin. Mer standard i Lynk.
Audin är bättre och mer matchad. I Lynk & co är det för mycket olika färger.

Båda var väldigt mörka, van vid att det är mörkt inne i bilen hade varit trevligt med ledljus – varit en positiv upplevelse om funnits.

Lynk – känns billigt, ljusgråa delen i dörren känns konstig, blandning mellan plast och syntetisk textil.
Audi – likes everything besides the plastic. Lynk – plastig, båda är delvis det.
Plast i bägge men på något sätt känns alla plastdetaljer bättre och finare i Audin.

Audin känns inte lika rymlig, det är svart. Om en accentfärg ska finnas så vill man att den ska vara tydligare så att den poppar (mer än i Lynk & Co).
Audi – hade behövt någon detalj, bara grått och trist. Audi – för mörkt.
Lynk - intetsägande pga svart och grått. Audi - försöker piffa men fortfarande svart och grått. Tycker inte att det så viktigt dem är plain och svarta.

Snyggt med Lynk-skärmen, På Lynk & Co drogs man till skärmen
Lynk - Trevligt med ljus & att det tänds upp när man kliver in.
Inte lika mkt i Audi, bättre välkomst ljus i Lynk pga skärm.

Lynk - Trim-detalj kunde ändras "Inte så nice".
Kanske inte ha något mönster i en solid färg.
Lynk - does not like the trim-details due to the colour and pattern.

The same, Audi feels a bit brighter and roomier.
Audin kändes ljusare och även rymligare.
Lynk & Co kändes mörkare.

gillar mer lädret i Lynk. Lynk – sätena.
Föredrar sätena i Lynk & Co, de känns smidiga. Lynk & Co – like the seats
Tycker om materialet i stolen på Lynk & Co
Audi - skönare säten då materialet känns mjukare & gosigt.
Audi - sätet passar en gubbe i Merca på 60- och 70-talet.

Lynk – gillade ljust tak och bra med variation med krom.
Gillar ej det röda sportiga, grabbigt. Men trevligt med ljust tak.
Båda är ganska mörka, speciellt Audi. Funkade bra att bryta av med rött i Lynk.

Lynk – "fanns det något ljus där" märkte ej av det.
På Lynk & Co märktes inte ljuset av så mycket, det är för lite. Hade varit kul med något som syntes även på dagen
Audin är bättre. Det dova känns lagom. Gött med svagt ljus när det är mörkt ute. På Lynk märktes inte ljuset. Tänkte inte på ljus i Lynk förutom i skärmarna som lyste upp.
Lynk & co - tänkte inte på ljuset i övrigt (utöver skärmen som lyste upp). Hade uppskattat när man inte kör eller när det är mörkt ute att det finns ett diskret ljus, för att det känns mysig, modernt och nytänkande samt att man kan se vad som gömmer sig i hörnen.

Lynk – missmatch röd/svart grund mot beige tak, två olika personer som gjort det.

Audi – färre material ger ett cleanare intryck.
Audi - känns som någon annan gjort den, matchar inte med resten. Lynk – mer enhetlig och känns nyare.
Positiv upplevelse i Audin pga mer enhetligt. Tycker det är bra att det inte är så många material
Olika material och finnish ger en trevlig dynamik men det kan bli för mycket. Vill ha en balans, en mix av modellerna.
Lynk – mer enhetlig och känns nyare.

Vill inte förändra. Lynk - Kanske inte hade valt den röda honeycomb detaljen, stör mig inte på den är van men hade varit snyggare utan.
Tyckte inte om färgen på sätena i Audi, kändes dammigt.
Gillade färgvalet, i alla fall på sätena i Lynk & Co.

Audi – väldigt bra, roligt att kunna välja färg, olika vit färg på infon i skärmen och knapparna, inget störande endast noterat.
Gillade LED-detaljerna i Audin samt skärmarna och e-trontexten på marken.
Audi – snyggt/nice med LED listerna, e-tron i marken lite coolt men ej nödvändigt.
På Audin var det kul med linjerna i dörren, roligt att de har ljus runt bältesfästet. Kul grej och det hjälper när man ska hitta dem.
På Audin så drogs man till ljusdetaljerna.

Föredrar Lynk pga mjukare ljus än Audi. Lynk – känns lite mysigare och varmare.
Bättre i Lynk, Audin känns mörk trots mkt belysning, (likt ljusexperten sa om upplevelse av mörkt/ljust).
gillar Lynk bättre då det är färre ljuspunkter. I Audin lyser det överallt, vet ej om det är nödvändigt hade kunnat dimmas.

Krom gillar ej att hålla i men lyfter utseendet.
Lynk - Materialet på reglage för fläktarna var nice (krom).
På Audin känns kromen mer metallisk. Lynk & Co – kromen känns plastig.

Lynk – stökigt, mkt material nära varandra
Mer robust i Audi. Audi – helheten och materialet i dörren,
Audin har fler detaljer med högre kvalitet men Generellt bra material i båda.
Materialet känns bra i Audin, hade inte klagat. Bättre än i Lynk & Co.
Audi - bättre kvalitet på helheten Lynk & Co – sämre kvalitet

Lynk - materialet i växelspak känns inte premium
Audi - skön växelspak,

Audi – skulle varit bättre. Materialet på ratten bättre på Audi.
Lynk – materialet i ratt känns inte premium

i Audin men på skärm och pianolack blir det många fingeravtryck, Pianolacken är plastig och ser smutsig ut, fingeravtryck och damm syns.

Appendix 21.

Poll on guidelines for car sharing

We are writing our master thesis together with the Perceived Quality group at CEVT. This poll is part of the user studies for our thesis work where we have established guidelines based on collected data. We would now like to ask for your help to understands the connection between these guidelines and the concept of car sharing.

We appreciate your contribution!

It includes three steps:

1. *Please rank them from 1-8 by putting a number in front of the name – where 1 is the most important, in terms of qualities a vehicle should inhibit for car sharing.*
2. *Please mark with yellow the statements that you ranked as 1 and 2. At the end of the poll, describe and motivate why you chose these two.*
3. *Please answer the question at the bottom.*

At the end of the poll you can leave a comment if you would like to add something that you consider important about a vehicle used for car sharing. The study is limited to the interior of the car.

Qualitative appearance
The interior should have an obvious qualitative appearance, it should be perceived as precise and a plastic appearance should be avoided to create a good and qualitative first impression.

Convey a message
The interior of the vehicle should have sustainable materials and a thoughtful design where ethical living & wellbeing have been considered. The appearance of the design should convey a clear message through the choice of materials, lights and geometries. The brand identity is also very important for the impression of the vehicle.

Clean, minimalistic, coherent & spacious
The design should be coherent and consistent throughout the interior to create a precise and minimalistic appearance. It should have a hygienic, spacious, harmonious and clean appearance.

Attractive to senses

The design should attract and appear appealing towards the visual, haptic and audible senses, in this specific order.

Level of complexity
Many high technical features attract visual attention, but it can be too much and lead to a frightening feeling, therefore the visual amount of new technology should be moderate.

Conscious design choices

It is crucial to make conscious design choices in terms of materials, functionality and design of the car interior. The materials should both be friendly for the environment and humans.

Inviting & functional lighting

The lights in the vehicle should be welcoming, and first and foremost meet functional needs rather than only being decorative.

Perceived premium

Perceived premium lies within the details and balance between different elements in the interior, it should be distinguishable that everything is thoughtfully designed and chosen. Therefore, it is key to choose materials carefully and weigh the price versus quality.

Describe why you chose these two specific statements (1 & 2):

Would your choice of the two statements be the same if you were to purchase the car instead of sharing it? If no, why?

Other comments:

DEPARTMENT OF IMS
CHALMERS UNIVERSITY OF TECHNOLOGY
Gothenburg, Sweden
www.chalmers.se

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