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How will the future of the luxury cars industry be in terms of sustainability?

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How will the future of the luxury cars industry be in terms of sustainability?

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Oath of personal work

I undersigned Gabriel Eduardo MONSALVE CASTELLANOS declare that the following graduating Project is my own work. No part of this research has been submitted in the past for publication or for degree purposes. I am fully responsible for the truthfulness of this declaration.

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Abstract

The urgent necessity of changing due to the fact that industries are polluting so much has become a reality. Due to this, the automotive industry has started shifting their business models exploring different possibilities and possible solutions to improve and become more sustainable in general. The purpose of this research is to analyze the future of the luxury automotive companies in terms of sustainability and how they are managing the different challenges. Therefore, it is important to analyze the general impact of the automotive industry within the environment. However, Luxury automotive brands and in general luxury brands tend to see everything in a different way. Thus, it is necessary to discover what brands are doing, how they perceive the change and where they are heading to.

Keywords: Luxury, Automotive industry, Sustainability, Luxury consumption.

1. Introduction

1.1 Introduction to the business problem

The automobile industry is a market that is very changeable and what makes it very interesting is that people's interests and behavior is changing much faster than the market. Consumers focus on many things at the moment of selecting a car. Factors such as the brand, the purpose or needs, price, style, space, safety, comfort and impact towards the planet composed this extensive selection process.

On the other hand, sustainability is becoming increasingly substantial for the companies. Companies in different sectors are making efforts in order to adapt themselves in order to take care of the planet. Additionally, consumers have become more aware and taken into account the actions and initiatives that the companies have related with the environment and specially in the automobile industry where companies have to change several things coming from the manufacture until the after sales experience and life cycle of the products.

The luxury car industry is one of the segments with the highest revenue, however, just few companies have started to take into account the impact that each car that they produce has on the planet. Problems such as pollution, global warming have recently become topics that people are getting more and more involved in. However, due to the fact that the luxury automotive industry does not produce as much as the mass market automobile industry, it is important to start to work on those subjects.

People with the highest income are mainly the ones who buy this kind of product and for many of them it is more important to generate an impact to the planet than get more money or higher status. Because of this some companies in their luxury segments have started to focus on sustainability. It is interesting the approach that they had given but not all of them had succeeded.

The objective with this study is to analyze what has been made by the automotive companies in terms of sustainability and how the luxury companies have reacted to it, how far have they gone and how far are they willing to go with this initiative. Additionally, the fact that the automotive industry in general is changing and adapting to customers' demands and shifting to electric cars, detect if there is the possibility for the luxury automotive sector to also join these initiatives and if it will be beneficial or not.

In my opinion, it is a relevant topic to take into account because that might become in the future of that industry and companies have to start to make several changes in order to not fall behind against the ones that already adjust some of their characteristics. In addition to this some brands have started to make partnerships in order to get involved with that cause so it will be also analyzed to discover if it will directly or indirectly affect the luxury car market. The study will be a qualitative study in order to be aware of how the present and how might be the future of the industry in this specific feature.

In that context, with the completion of the research, it is necessary to study which are the sustainable purposes that the automotive industry is taking into account and the different plans that they have for the future. With this, the following question is posed: How will the future of the luxury cars industry be in terms of sustainability?

1.2 Justification

Global warming and air pollution by human made gases such as CO₂, is mainly done by the automotive industry that results in a great risk for human health. (Abro, Chandio, Channa, & Alaboodi, 2019). Cars have become an asset that people use daily in terms of transportation. This is why the demand for those is growing increasingly fast. For this reason, companies within the automotive industry produce as many cars as they can in order to be able to supply the demand.

The automotive industry has increased the weight of cars due to increasing people's luxury and safety which leads to consuming higher energy in the form of fuel and obviously increasing global warming and air pollution. The share of the automotive industry which is related to global warming in the form of CO₂ is roughly about 17%. (Abro, Chandio, Channa, & Alaboodi, 2019)

With this also comes consumer behavior within the industry. There are so many features to be evaluated from the side of the customer and it generates the companies have to develop and focus in so many different areas in order to first of all attract more customers and after that fulfill their needs and preferences that are changing along with the different trends and initiatives.

Additionally, this is a special challenge for the automotive luxury industry. The fact that the luxury sector behaves differently than the mass market sector makes it complex to assume certain changes. Luxury consumers are oriented and focus on different details such as craftsmanship, performance among. However, the fact that sustainability initiatives have become really strong and companies have started to shift towards them due to the consumer's demands, the luxury automotive sector has also to be aware of it and make changes.

For this reason, we see the need to evaluate more thoroughly how relevant are the sustainable initiatives for the luxury automotive companies and how they are managing this but at the same time considering that the luxury industry demands much more than just a product, the experience and the craftsmanship are crucial factors. The above leads us to analyse and understand how is going to be the future of sustainability in this specific sector.

2. LITERATURE REVIEW

2.1 Luxury

Luxury brands are considered as one of the fastest growing brand segments and also having a great profitability. However, the definition of luxury might vary depending on the experience and consumer needs. In this order, according to Hennigs N et al. “successful luxury brands compete today based on a close relationship with customers and their desire for pleasure and indulgence of the senses through objects or experiences that are more ostentatious than necessary.” (Hennings, Wiedmann, Klarmann, & Behrens, 2015)

The term “Luxury” also make reference to the variety of products ranging where is possible to find fashion goods where is possible to include leather goods, shoes, jewellery, watches, perfumes and cosmetics or products like private yachts, jets and luxury vehicles, the last one being the one that leads the sector in terms of overall value of the market. Also the term is associated with light because the root “lux” means that in Latin. Luxury is also associated with emotions, the emotional value and desire for pleasure is what most of the time motivates customers but the concept tends to adapt depending on the culture and society. (Brun, 2021)

The concept of luxury has been discussed a long time and it usually is defined through the products that you can find in the market. According to Wang, Y. luxury is directly related to scarce, expensive and exclusive products that are bought for wealthy people or the ones that can manage buying them and it is for this reason that because of the price and exclusivity it is possible to make the direct relation with wealth. However, luxury does not go only with this characteristic there is much more. A luxury product is also recognized for their craftsmanship, design and heritage. (Wang, 2021) Additionally, it is suggested that luxury is recognized by its rarity, uniqueness, exclusivity on a product that is available to few people but desired for many others. In addition to this, the concept of luxury can also be related with beauty because it can be denominated art applied to an item. It is believed that luxury generates added pleasure and engages all the senses with no time interval. (Gokhale, Mishra, & D.R, 2021)

When it comes to craftsmanship and design, it is essential to highlight the uniqueness of this kind of product. What makes a product to be special and have high prices are their qualities or features and also the fact that not everyone can have one of the pieces and sometimes the products are even made by hand to give an extra-detailed experience. In addition to this, there must also be luxury services such as tourism that must focus on the exclusive and perfect experience that they have to bring to the customers. In fact, exclusivity could be seen also as a sign of superiority because it is something that you have and many people want to have it and are not able to get it yet.

Luxury products might be seen as art pieces but the art perspective differs with the traditional art and it is seen more as a trend. Nevertheless, it is important that luxury products acquire this relation with art because it makes them more valuable and desirable and that effect ends up creating a strong consumer experience. (Wang, 2021) However, the definition of luxury might have different perceptions because it is necessary to consider the culture and context of the person that wants to define it.

Another possible definition for a luxury good or product would be one that has a positive elasticity of demand where an increase in price results in an increase in demand. However, luxury can have a different meaning to different people and one of the factors that leads to it is personality. With personality it can change how much they spend, age, nationality, education, background, all of them can determine a perception and define attitudes towards luxury.

Dubois et al, defined 3 possible consumer segments in the way that luxury is perceived. The first one is the elitist, that has a traditional vision of luxury and they are the ones that actually believe that luxury is appropriate just for a few selected people, also that a certain level of education is required to appreciate this kind of goods. Also they deeply consider that luxury products cannot be sold in supermarkets or average stores and even less be mass-produced and

for that reason those products are expensive. Secondly there is the democratic group that are the ones that consider that many people should own luxury products they don't believe that refinement is necessary to understand luxury. They are in favor of luxury goods as mass-products. Finally, the ones that are named the distance group represent the ones that have a view of luxury as something for other people. They do not have any attraction or interest in luxury goods and sometimes consider them too expensive or even useless. (Dubois, Czellar, & Laurant, 2005)

“The luxury market is characterized by being exclusive and selective in which only a small part of the population can access”. (Vargas-Hernandez & Guadalupe, 2015). It is essential when referring to luxury to also make reference to heritage and sometimes luxury brands or products are not recognized or popular for their attributes, but because of the influence and history. Luxury brands and products have stories and sometimes this is what gives them a higher value in the market. Luxury is a complex market and part of the experience is discovering what they are not telling you or what has happened through the time. (Bridel, 2010)

“In the luxury industry heritage plays an essential role in the brand's identity because it creates consumer appeal, contributes to brand and product differentiation and is associated with brand authenticity and reliability.” (Carvajal Perez, Le Masson, Weil, Araud, & Chaperon, 2020)

Heritage is a big challenge for brands, especially for marketing and design teams. There is a necessity to cooperate in order to succeed because innovation is necessary but for luxury brands respecting tradition in order to satisfy their customers. (Carvajal Perez, Le Masson, Weil, Araud, & Chaperon, 2020)

Innovation projects within the luxury industry must embrace objectives that are coherent with brand tradition. Tradition is a subject that cannot be left behind because of this, usually luxury brands have creative individuals that are in charge of maintaining the balance and protecting the brand identity but at the same time discover what should come in the future for the brand. However, the fact that heritage needs to be protected sometimes becomes an obstacle for creativity because it will create limits and barriers that cannot be explored because it could damage the brand image. For this, what is usually done is to enrich tradition itself where brands innovate over something that was done previously. (Carvajal Perez, Le Masson, Weil, Araud, & Chaperon, 2020)

It is important to understand the difference between luxury and premiumness because they are two concepts that might cause confusion. When referring to luxury it is related to how a product makes the consumer feel while premiumness talks about the quality of the product and how it is

marketed. This is why it can be said that luxury is more personal or internal while premiumness is more external and related with the product. (Bridel, 2010)

Luxury brands can be divided in two categories, first of all the ones that offer a symbolic value for the customers and tend to be more associated with lifestyle than for the function of the artifact and on the other hand, the ones that are actually known because of their technical characteristics. (Brun, 2021) Luxury is a segment like no other, and it is possible to see it with the anti-laws of marketing that are necessary to properly manage those brands because if luxury brands were treated like normal brands, they would not have anything different or special.

2.2 Sustainability

According Charlott Hubel et al, “Increasing societal and environmental challenges like poverty and climate change have moved sustainability and made companies to consider deeply their impact on those subjects”. (Hubel, Weissbroad, & Schaltegger, 2022) Sustainability is a concept that has become more popular and makes reference to satisfying the needs if the present, without compromise the resources of future generations. (Ramos-Hidalgo, Diaz-Carrion, &

Rodriguez-Rad, 2021) However, it was recently that the world started to discover the level of the deterioration of the planet and companies and organization started to get conscious about it and also because consumers and society in general was paying so much attention to this specific issue.

After this, there were some trends that became strong where it is possible to include the eco-friendly products, the tendency of buying green products and the causes that the organizations support towards the preservation of the environment. Additionally, those trends are directly related with consumption, where, basically it is an attempt of giving better quality of life and reducing in its minimum expression the usage of natural resources in every single good or service offered. (Ukko, Saunila, Rantala, & Havukainen, 2019)

In addition to this, sustainability will be necessarily associated with innovation and development because to become sustainable there are changes that are completely necessary, there will be generated new ideas, services, goods that are able to deal with the different environmental issues.

According to Jannic Horne et al, New ventures are a fundamental part in the sustainable innovation process and usually it is what motivates companies to change their business model. (Horne & Fitcher, 2022)

2.3 Sustainability in luxury industry

The meaning of sustainability might be different in every sector and this is also the case of the luxury industry, in this industry the sustainability is about preserve the know-how and the art but at the same time respecting the environment and recently, luxury brands have also discovered that become sustainable is beneficial for them and it will attract and retain more customers also. (Aybaly, Guerquin-kern, Madacova, & Van Holt, 2017)

Also, there has been a significant change in the way of purchasing in this specific industry and consumers stop just looking at the brand name or logo and they have become more interested in the product information, they prefer to have the complete knowledge of the product. This kind of behavior made the companies establish sustainability as a priority because it stopped being an option and it has passed to be essential to preserve the brand image.

It is widely believed that if a luxury product is eco-friendly or sustainable the quality is low and this is one of the subjects why luxury companies do not focus all their products in this trend and sometimes even if a customer sees this kind of sustainable products favorably, it does not mean that they will pay the same price for a product that now have different materials and different supply chain process. (Perez, I, Tevet, & M.M, 2020)

On the other hand, there was a mismatch between what luxury represents and what sustainability is looking for. For instance, usually luxury companies do not pay much attention to the cost if the quality is great while sustainability goes more with minimizing consumption that is usually investing few inputs that are the costs. Also luxury products are usually something that is not necessary but people want it while sustainability is based on necessity. Those two reasons are some of the reasons that there is a doubt whether to believe or not that luxury companies are actually becoming green or they are just doing greenwashing.

2.4 Luxury consumption

As mentioned before luxury is linked with features such as scarcity, exclusivity, high price and excellent quality, apart from this it is important to note that the motivation of buying luxury products must have a meaning. The motivation can be generated by different purposes, those purposes can be economic, emotional, intimate, among others. Usually because of its excellent quality, luxury products tend to be really durable which might be considered as sustainable consumerism. This is one of the main ways that has been possible to link sustainability and luxury consumption. (Hussain, Paul, & Koles, 2022)

Consumers today are looking for products that can provide functional value and emotional benefits but at the same time satisfy what they want.

(Veblen, 1899) was the first one to discuss luxury consumption patterns by the leisure class and he concluded that consumers use luxury products to signal wealth and status. These goods are usually recognized as belonging to the upper class of the society or the elite. According Nwankwo et al. (2014) “consumers are primarily motivated to purchase luxury brands due to

quality, uniqueness and exclusivity, they purchase luxury products to differentiate themselves from the group they belong to.” (Nwankwo, Hamelin, & Khaled, 2014) This can be also seen with consumers shopping at exclusive stores of luxury brands and having a completely different experience. Finally, products with limited availability or limited edition is one of marketing strategies for luxury goods as this may satisfy consumers’ high need for uniqueness and avoid conformity by using luxury brands. (Tak & Pareek, 2016)

However, the consumption might vary depending on the culture, because not in every culture luxury is seen in the same way and with the same purpose. For instance, in China, luxury is directly related with hierarchy and status because it is believed that consumers in Asia usually buy luxury to get social recognition and not to satisfy needs. “Consumers today are looking for products that can provide functional value and emotional benefits but at the same time satisfy what they want. A brand which succeeds in forming its own strong personality can attract and retain customers of similar personalities.” (Kastiya, 2016)

Luxury consumption has been changing through the years, trends like innovation and technological sophistication have caused it. Because people are always looking for something better and because of this, customers have become more demanding and essentially making emphasis in the experiential sector. Customers have started to buy more than just a complete

experience, it does not matter if the experience is online or offline, the point is that it must be something completely different and unique that motivates them to come back and experience it again and again.

It is believed that the creation and preservation of the value is directly related with customer satisfaction and loyalty and this is because the desire and the consumption of luxury brands involves how the customer perceived value in different areas such as financial, social and functional. Those perceptions are also related with the emotional needs of the customers. When making reference to the financial value, it is necessary to associate it with exclusivity and rareness that leads to a customer preference of a product and for this reason customers tend to associate high prices with high quality and at the end it is estimated that the more expensive, the more desirable and valuable it becomes. (Hennings, Wiedmann, Klarmann, & Behrens, 2015)

Now in respect to the functional value, it is basically making reference to what the consumer expects to obtain from obtaining a product from a luxury brand. It could be the quality of the product, uniqueness, the service provided with superior characteristics. In other words, the functional value of a luxury brand is driven by the thoughts and assumptions that the products that are offered are excellent and with a better performance than normal or average brands. Then about the social value, it is important in terms of consumption due the fact that luxury brands

usually address certain values and sometimes even display social status that has influence in social groups. (Hennings, Wiedmann, Klarmann, & Behrens, 2015)

Loyalty is a definitive factor specially for luxury brands and what is related with consumption because thank to this there is the possibility to have a strong word-of-mouth belief and due to the fact that not everyone but the ones who have acquire the product can actually judge if the product is what they expected or not and recommend it.

It is recognised that purchasing and behavioral intentions can be influenced by the perception of the products or brands. According to Bridle, B., there are mainly three variables that affect behavioral intentions that are customer satisfaction, perceived quality and expectations. Customer satisfaction makes reference to emotional reactions and experiences that usually is related with loyalty, expectations and price. Perceived quality was defined by Zeithaml as “a consumer’s appraisal of a product’s overall excellence or superiority” in other words, is how the consumer sees the product and its performance or quality. One of the differences between these two is that it is possible to perceive the quality without purchasing it, but it will be impossible to obtain customer satisfaction if the product is not acquired. (VA, 1988)

However, the perceived quality can be also directly impacted by the mood, previous experiences, products origin, brand and in luxury it is related with exclusivity. An example that in the automotive industry it is possible to link craftsmanship with perceived quality. And finally, regarding expectations that are directly linked with the brand image that the company might have created or feedback from people that confirm or disconfirm the quality or satisfaction with a product. (Bridel, 2010)

Additionally, something that was found from this field of research is that consumers, specially the ones that are located in developing countries usually prefer brands with a nonlocal origin because it is well known for the quality and the status which makes reference to the value of brand foreignness. (Bartikowski, Fastoso, & Gierl, 2019)

2.5 Automotive Industry

One of the industries that has a carbon-intensive manufacturing is the automotive industry. The production of the vehicles demands so much energy and also a big usage of raw materials. In

fact, most of the emission industries are involved in direct or indirect way with the process of manufacture of the cars, it comes from the extraction or production of the raw material. Cars usually involve metals, plastic, glass, rubber among others, all of this to accomplish the full process of manufacturing a car. After seeing this, it is possible to say that the automobile sector, especially the manufacturer, is responsible for the pollution in that sector and it is rising constantly because of the huge demand of cars worldwide. (V & Santhia, 2022) The automotive industry has increased the weight of cars in order to increase people's luxury and safety which leads to consuming more fuel(energy) and this becoming into global warming and air pollution. (Abro, Chandio, Channa, & Alaboodi, 2019)

It is a new trend that companies have decided to reduce their carbon-print and they have started to become environmentally sustainable. The problem with this is that only the biggest companies can do it easily because it requires big investments to change the business model and also to innovate in this sector. This is why top companies have focused their last efforts by exploring the electric market and also the hybrid one. This with the purpose of reducing pollution. Nevertheless, those efforts cannot be made only in the final product. The complete process of manufacturing, every single step has the necessity of rethinking themselves to add something to the big effort that the company is making. For this is that the circular economy model has started to be used and specially in this industry.

Additionally, the whole industry must start to consider if it is worth it to change the business model before doing it, because for one side there is the environmental impact but on the other side the revenue and some other metrics will vary depending on what they do and how much they invest. (V & Santhia, 2022) Lower emissions mean higher efficiency in production systems which will be considered as a competitive advantage.

The acquisition of a car is the best alternative that a customer has to purchase his favorite machine but there are different factors that can influence his decision. The first factor is the brand that can be the name, symbol or combination of both that identifies the maker of the product. Brands in specific have a very important role while the customer is deciding which car to buy and it is fundamental for luxury cars. The second factor is the social parameter or criteria, size of the family, vehicle use, lifestyle among other factors. The third one is about the roads and its infrastructure, it is a really important factor and so influential at the moment of buying a car. When considering buying a luxury car it is even more important because it is essential to know if the car passes through all the roads without injury. (Gokhale, Mishra, & D.R, 2021)

Another factor is the price, usually there is a potential budget established by the buyers. The budget tends to vary depending on the person and it is usually flexible according also with what

the seller offers and more often it happens in the showrooms where it is possible to get cash discounts, an extended free guarantee, swap incentives among other things. The fifth factor is style and this factor can even become personal because cars are meant to be personality extensions, usually the style is focused directly on fulfilling the buyer's expectations and not anyone else. Also fuel economy and performance is within the factor because with only one of them the buyer will not be completely satisfied, so the idea is to find the balance between both. (Gokhale, Mishra, & D.R, 2021)

The seventh factor is space; this usually influences people who are going to buy a car for the first time and the ones that already own one are seen as an upgrade. It is important to include comfort and safety, the higher the number of features, the better and it increases the value of the car. Then after sales service is another factor because the car needs to be checked and maybe some pieces will need replacements and it will create loyalty too. Finally, resale value for people who do not tend to have a car for a long time. (Gokhale, Mishra, & D.R, 2021)

Manufacturing within the automotive industry is something that has to be taken into account. At the beginning in the 1800s vehicles were powered by different energy sources such as steam, gasoline, electricity, biodiesel but it was so expensive. When Henry Ford appeared and with him, the assembly lines increased efficiency, production was growing fast and this generated that

automobiles became more accessible to the general public. Thus, the financial health of the automotive manufacturing industry was influenced by the cost of production of the vehicle that was mostly the raw material such as steel, iron, plastic, aluminum, glass and other materials. However, nowadays companies have started to shift from aluminum to steel in order to reduce the weight of the car and also increase fuel economy and with this production costs. (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

Within the manufacturing process there is a variety of chemicals that are used and they are considered as waste after their useful life. According to Gaona et al. Automotive manufacturing facilities can have a significant impact on the quantity and composition of the TRI chemical wastes they generate and manage through selection of chemicals used, their application, and the design of fuel-efficient vehicles. Fossil fuels are the main source of energy that is used to power first motor vehicles and also manufacturing facilities, sometimes this power is not directly coming from a fossil fuel but the electricity that is used comes from fossil fuels. “The fuel economy or fuel efficiency of motor vehicles also influences the quantity of fuel combusted and, therefore, the amount of pollution emitted.” (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

In the manufacturing practices it is necessary to include, metal bending, machining, assembling metal or plastic parts into finished products and these operations usually generate

scrap metal that usually is recycled or released to air, land and water in form or dust or waste. For this it is necessary to have waste management methods. One of the most common is recycling. It is applied most of the time to metals and metal compounds. (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

2.6 Sustainability in the Automotive Industry

There are several activities that contributed to the automotive industry progress in terms of sustainability. It is necessary to consider and look for practices against the pollution, it is believed that “pollution should be prevented or reduced at the source whenever feasible; pollution cannot be prevented should be recycled in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner” (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

The practice that is considered the most desirable is Source Reduction that mainly refers to the practices that reduce many substances from being released to the environment before recycling or other methods. It is necessary to make some changes among the equipment and the use of technology, also the process modification, sometimes having to redesign products or substitute raw materials. With source reduction, also some practices such as treatment and

recycling that have been implemented in the manufacturing life cycle of the automobiles. According to Gaona, S.D. et al, there have been “process and technology modifications implemented to reduce energy consumption and the amount of raw materials used; safer, environmentally friendly alternative materials substituted throughout the manufacturing process; recycling of metals and solvents to reduce environmental impacts after the useful life of a material or product; and fuel economy improvements contribute to reducing the industry’s environmental impacts by manufacturing vehicles that are more fuel efficient.” (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

Thanks to the compromise of the companies on sustainability, the sustainability reports where it could be possible to find an overview of sustainability efforts, accomplishments and goals. Also if it was possible to find data about the usage of water, energy and waste generated, it was made specially by the largest automotive companies. Another tool that exists in order to be updated in terms of what is happening with sustainability is the eco-efficiency score that is a comparison between the environmental performance and the economic output. With help of this tool it was discovered that the production of the materials used by the industry produces more pollution than the automobile production itself. (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

It was found that changes with processes and technology have the potential to reduce waste at all stages of production and when referring to chemicals, the solvents, lubricants among others become chemical waste after all. For this, source reduction practices, recycling and waste treatment can reduce this problem substantially. One of the possibilities is to improve the energy efficiency in the automotive production process because it will reduce the amount of fuel that is burned and at the same time will reduce the quantities of chemicals. Regarding the process improvements, decreasing cutting fluid, scrap and energy loss, especially within the process of motor vehicle manufacturing, will save production time, energy consumption and the usage of raw materials. (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

In the automotive industry, many different chemicals through the production process such as paints, coating, resins, adhesives and this make necessary the search of better and safer options for the ingredients to do the same processes. However, it is necessary to confirm that the alternatives are viable and cost-effective. For the paints and coatings, there were found alternatives such as UV-curable paint primer, a bio-based oil that could replace petroleum based solvents and water based refinish coating that helps to reduce metal sludge. (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

Regarding the bio-based materials, Gaona, S.D. et al mentioned that they have been use before to make different vehicle components, specially for details in the interior of the car, some examples are soy-based foams in seat cushions and natural fibres from bananas, jute, flax to do the in door panelling. On the other hand, for mechanical components, bio-based materials might not be as efficient and provide the durability needed but companies like Ford, Daimler and Goodyear have been able to implement them. Goodyear with a bio-based isoprene that replaces a petroleum-derived ingredient in the rubber for tyres. Daimler with air filters made from bio-based polyamide and Ford with brake lines and fuel tubes made by bio-based polyamides. (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

While modifying production practices is necessary, recycling has an essential role not only in the manufacturing process but also at the end vehicle life cycle. Starting with the metal scrap due to the fact that the body of the vehicle and mechanical components come from metal. With solvents, it is possible to recycle it but commonly paint solvents. Nowadays there are companies that focus on those services and they partner with companies that in the end it helps them to save money on disposal costs. As I mentioned before, the after life cycle of a vehicle is so relevant in terms of recycling. It is because even if the car cannot be repaired or only sold, some parts of the car can be reused in other automobiles, it can be engines or even doors. (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

Also the fuel economy is a concern from the side of the automotive manufactures and they have been able to improve in this areas with solutions such as “regenerative braking to charge hybrid electric vehicle batteries; hybrid electric and combustion propulsion systems; continuous variable transmission to allow engines to run at their most efficient rotations per minute; smaller engines that rely on turbo systems for power; and use of lighter materials and reduction of air resistance.” (Gaona, Keenan, Vallet.C, Reichle, & S.C, 2020)

2.7 Luxury Vehicles

The luxury car industry is one of the world’s fastest growing sectors in many years. (Apak, S., 2012) Owners have started to look for additional features that the luxury cars offer and this is why brands have the necessity of having an appropriate pricing strategy that correspond with the high service and product quality. (Apak & Gogus. G.G and Karakadilar, 2012)

The consumption of luxury vehicles is followed by the next criteria. First of all, the quality. Quality can be analyzed in different dimensions like quality of performance, quality of

conformance and quality of service. After this, reliability that is related with the durability of the product from the customer side and in this is included the after sales service support. Technology is another factor that influences customer preferences for the fact that is completely related with the environmental sensitivity but also the way of usage and the comfort and this creates a better experience, specially with the luxury cars. In addition to this, flexibility makes reference to the different models that are offered to customers depending on their necessities and their desire. (Apak & Gogus. G.G and Karakadilar, 2012)

For this it is believed that the strategy that is used in the automotive luxury segment is differentiation by delivering a product that is perceived as valuable and different. The strategy for the segment is targeting customers that are willing to pay higher prices, in this differentiation strategy must present attributes such as sophistication, prestige and quality. (Vargas-Hernandez & Guadalupe, 2015)

In the automotive industry the most important part is to fulfill the customer's requirements and needs in order to have the best product development process. Those requirements are basically focused on the attributes and in the value generation. With this it is possible to say that the Luxury automotive industry has a customer approach when referring to product development. (Stylidis, Rossi, Wickman, & Sodererg, 2016) Luxury vehicles and in general other luxury goods

for having certain features. For instance, Luxury cars can be seen for their exclusivity, design, heritage and their aesthetics.

According to Rosecky and King, many writers have explored the luxury car customer expectations and most of them get results related with consumer loyalty and brand change. This is due to the fact that these days' customers care more about wealth and the community and there is a need to know what the products they buy actually do. (Gokhale, Mishra, & D.R, 2021)

When referring to a luxury vehicle in marketing is a vehicle that offers luxury at an increasing, beyond the strict requirement, attractive and friendly features. (Gokhale, Mishra, & D.R, 2021) The luxury automotive industry seeks to win customers through fantastic engineering, a stunning and superior design, and all the time offering differentiation with the purpose of achieving the mobility necessity but at the same time offering exclusivity on their products. (Brun, 2021)

3. METHODOLOGY

3.1 Research Methodology

In order to analyze what is going to be the future of the Luxury Automotive market in terms of sustainability it is important to go in depth within the industry and for this it will be made an exploratory analysis of how it has been until now and how companies have approached this specific topic.

It will carry out a qualitative research which will be made from March 2022 until September 2022. This qualitative study will aim to understand what the Luxury automotive companies have been doing until now in terms of sustainability and the path that luxury companies are following also to become more sustainable.

It was decided to make interviews with professionals that are directly involved with the automotive industry because they have knowledge about what the company has been doing to achieve different challenges related with sustainability but also with the purpose of discovering what is their personal opinion about it and how they see it.

In order to explore this subject in the correct way, the interviews will be applied to a specific number of luxury cars experts that have been involved with sustainable projects. This is in order to make sure that they at least have a defined point of view about the sustainability in the industry and the future of it.

Therefore, after conducting all the interviews, the transcripts will be used for analysis purposes in order to detect what is missing from the literature review regarding the automotive luxury industry and the perception from the customers and the companies in sustainable initiatives.

3.2 Sampling and recruitment

To develop the interview, it will be conducted non-random sampling. It would be a judgmental sampling in order to provide a range of opinions and knowledge that ensure the quality of the information gathered. The idea of the sampling is to target people that are currently working in the automotive industry and also have a strong background in the same one because they have more knowledge to judge the actions and initiatives from the companies focusing on sustainability.

Regarding the size of the sampling, 10 participants will be selected to conduct individual interviews, all of them working directly in the automotive industry. It is necessary that they are involved and have knowledge about the sector in order to have some critical opinions about the sustainable initiatives or efforts that companies have established for themselves. People were contacted through personalized messages, letting them know what the purpose of the interview was and setting an appropriate date for it. The purpose of the interview was not completely explained from the beginning with the purpose of getting an honest and not prepared answer about the topic.

3.3 Data collection

For this research, the data was collected by doing semi-structured interviews due to the fact most of the people interviewed were located in different parts of Europe. There were used platforms such as Teams, Google meeting and WhatsApp. Despite that the respondents could respond freely to the different questions, it was still a structure to respect. By using an interview guide the purpose was to cover all the topics that are necessary to understand while responding with their perspective.

The interviews were separated in two sections; first it was asked demographic questions such as their gender, their origin, current occupation to make sure that the participant has the proper requirements to be interviewed. Then, the following questions contained information regarding information from the sector to check how well the participant was informed about the concepts explained in the literature review such as their experience in the automotive sector, sustainability, the luxury perceive on the automotive industry, consumption in the automotive industry, relevance of sustainability for the companies and customers among others. The interviews were conducted completely in English, lasting between 20 and 30 minutes and letting them know that it will be used for research purposes.

3.3.1 Demographic questions.

1. What is your name?

2. Where are you from?
3. What is your profession?
4. Where are you working at the moment and what is your role at the company?

3.3.1 Research questions

1. How long have you been working in the automotive sector and why do you like working at it?
2. Is sustainability important for the automotive industry? why?
3. Do you think that sustainability can be as important as craftsmanship and performance for the automotive industry? why?
4. How do you see the future of the automotive industry in terms of sustainability?
5. Do you think that sustainability has become a crucial factor in the decision making process of the customers?
6. Do you consider that automotive companies do enough to become sustainable?
Yes/no Why?
7. What kind of strategies are implemented or have been implemented by the automotive companies in order to become more sustainable?
8. What is your personal opinion about electric cars? Do you think that they are completely sustainable?
9. Do you think that the luxury automotive industry has to be concerned about sustainability? why?

10. As a personal opinion, would you buy an electric luxury car?
11. What do you think is the most important factor companies need to keep in mind when producing a sustainable premium or luxury car?
12. Do you believe that sustainability within luxury cars can impact the offer and demand?
13. What relationship do you see between sustainability and performance regarding premium and luxury cars?

4. ANALYSIS

After the qualitative research, it was decided to make the transcription of the interviews in order to facilitate the analysis of the answers and give a proof of their veracity. The analysis will be made following the order of the questions that were asked to the participants and making emphasis on the importance that they had with the topic that has been researched. All the interviews were made to people that are directly involved with the automotive industry. Within the industry there are different beliefs and thoughts about what sustainability is and if it is actually implemented in the automotive companies. Companies are working on their strategies especially in this area for different reasons, some of them have already implemented different strategies in the manufacturing process, others have just begun with the CO2 reduction with the final products with initiatives such as shifting to Electric cars. Every single effort is taken into

account but there is the doubt if the luxury part of the automotive sector is also taking responsibility for the planet and the environment.

4.1 Sustainability and the automotive industry

The main and most important topic of the research was asked at the first moment. It was necessary to know what the respondent thinks first of all about sustainability, how they see it and their personal understanding on the topic and with this move into how they see it in the automotive industry. In the first place, one of them considers that more and more people within the companies are taking more serious aspects with the environment and have good sensitivity about green energy, solar energy, energy saving among other topics and looking to implement them in the factories. Sustainability is a topic that has been introduced for most of the people in the industry recently as one of the respondents affirmed that a few years ago this kind of topic was not even considered for the companies. However, in the last 10 or 15 years it has become more present and considered at the company strategic level. It was seen as a challenge specially for this industry because it is one of the industries that pollute the most.

Sustainability in the industry can also be seen in two different ways, the first one is through electrification as I mentioned before that is how most of the companies are responding to this trend. But it was found that it is considered as a short or midterm solution same as hydrogen that

is still being developed due to technical challenges and the other way is the connectivity that the vehicles offer to people. Some companies are saying that they are having a sustainable business. What is affirmed by several of the respondents is that every single company within the sector is looking for CO2 emission reductions and also the use of the materials, it is important to keep in mind which resources have been used and how much because it will affect future generation.

4.2 The importance and the future of sustainability in the automotive sector

The questions about sustainability and its comparison with other characteristics and the future of it, were one of the most important since it is necessary to detect where the companies are going or what is the target. There is no business industry that avoids environmental purposes. Even though sustainability is a topic that has started to be discussed recently, it has become really strong and it has been the job of the companies to understand this term in the correct way. Some of the respondents consider that sustainability has become more important than craftsmanship and performance. The fact that younger generations such as the Z customers are becoming more interested in building experiences and also the sustainability topic. Generation Z is looking for a pleasant experience and a safe drive.

On the other hand, there are some respondents that consider that sustainability is as important as performance and craftsmanship but it will be considered more important in the following

years. Sustainability purposes are still being developed, new strategies have been released with the purpose of giving it the same level of importance as other fundamental features. It was provided by a respondent the example of Tesla, a company that manufactures nothing else than electric cars. The stunning work that Tesla has made in the last years is a clear example of the importance that E vehicles have. However, Electric cars still have a long way to go and especially in features such as the distance that this type of cars are able to go because the batteries are not still ready to travel long distances.

Regarding the future of sustainability in the automotive sector, for some respondents it is believed that the industry itself will not change, what is going to change is the components for the engine, the power, the battery or the energy. However, the minority of the respondents were the ones that considered that. Some others affirmed that there are different strategies that have been implemented but the missing point is still to share the strategy and the different initiatives with every single employee or at least let them know what has been done. Sometimes these topics are so far from the production line and it is important to involve every single stakeholder.

It is believed for several of them that it is important to start to look forward to the medium and long term. It is necessary to solve some equations and constraints. One of the constraints is regarding the technology and in this case the 3D Technology and this is directly related with the goal of making batteries last more regarding the distance that they offer to the vehicles. In addition to this, the infrastructure is essential to make this shift work. It is necessary to adapt and

build charging stations in several ways because at the moment people are starting to queue to charge the cars and most of the stations are private initiatives so it is necessary that the government start to analyze these factors if they are already charging different taxes to reduce the impact towards the environment.

On the other hand, the competition between the sectors is something that is in a way delaying the development of the batteries mainly. It is believed for some of the respondents that it is necessary to start partnership between the automotive companies and companies that have more experience in building or creating batteries because if each of the competitors try to create their own battery it will take a really long time until they get the expected result so with the previous analysis it would be profitable to establish partnerships as soon as possible.

One of the most discussed things that most of the respondents agreed on is the fact that electric does not mean sustainable. Electric cars offer a great advantage because it is really sustainable on the road but the production of energy will also become a problem. There are a lot of materials that are needed to produce the electric batteries, there are not enough materials in order to offer every single car on the globe with an electric battery. As mentioned Hydrogen cars are much more environmentally friendly but they are not prepared to transport passengers. Additionally, there are other areas where automotive companies have begun to improve such as the leather seats or the steering wheel.

4.3 Customers and the reaction towards sustainability.

Customer needs and satisfaction is a topic that is extremely important when you are dealing with products that offer a service. According to some of the respondents, they do not consider the different features of an engine, people tend to focus more on aspects such as pricing, if it is expensive for the insurance, the color, the equipment but the engine is most of the time one of the less important things. However, it is important to clarify that it depends on the segment which the company focuses on because the needs vary depending on that. The generation targeted also is relevant because not everyone is looking for the same purposes, old school buyers tend to think about the sensation and performance while younger generations are more aware about the present situation of the environment and take care more about the planet.

Nevertheless, People is turning to E cars but not exactly because they are willing to contribute with the environment but for example in France they receive around 6000 of incentive, so it shows that people is expecting something back in order to shift to electric cars and sometimes not even changing to electric but instead of it, just moving to hybrid cars where they also receive incentives and also they do not forget about prices and something that they can afford.

On the other hand, it is important to analyse the country where it is considered to sell electric cars that are the ones that have an environmental affinity. It is not a mystery that electric cars used to be the pleasure of the rich because as mentioned before it is more expensive than a combustion engine. For instance, it was explained by one of the respondents that if you analyse the market of these cars in Eastern Europe and Latin America, the purchasing power is considerably lower while if you analyze countries such as Sweden, Norway or The Netherlands that are rich countries the market is completely different.

4.4 Initiatives of the automotive companies towards sustainability

In the automotive industry, companies have started to do their best in order to become more sustainable. The first step to do it is going beyond and seeing how sustainability is present in different areas of the company from the manufacturing process until the car is on the road. The culture of the company is a characteristic that is necessary to transform and now a moment it is necessary that the company think with a green mindset while developing and defining the new strategies. It is impossible to say that companies within the industry have done enough because there is a lot to offer but until now, most of the companies have performed really well while responding to sustainability.

It is important to be aware that to be able to afford the change, it is necessary to have a big amount of budget. The need to invest to produce a better battery in order to succeed with the electric market and it is actually ongoing. There have been billions of dollars invested in order to manufacture a proper battery. However, according to one of the respondents, companies have to keep in mind that not everyone can afford an E car and it is important to find a way to reduce its cost.

Automotive companies have implemented several strategies to become more sustainable. Most of the companies focus their efforts now a moment on the CO₂ that is released due to the manufacturing and the final product itself. A goal has been established to become CO₂ balanced in the next 10 to 15 years. Reusing, recycling, using solar panels are some of the initiatives that companies have determined.

There have also been initiatives for the factories to become green, for example green roofs, it means garden on the roofs. This is with the purpose of keeping the building cooler so the air conditioning will not be necessary. The usage of energy is another fact that is important to focus when referring to the factories. This is why companies have decided to have someone in charge of the sustainability of the business and it is just one level below the CEO, this showing that is becoming one of the most important areas for companies.

4.5 Electric vehicles

This can be considered as a discussed topic because the opinion and beliefs over electric cars are balanced. The first aspect regarding electric cars is the problem with the distance that they can travel without recharging them. For long distances, at this moment, it is not useful to have an electric car because a trip is going to take longer than expected if it is necessary to stop along the road. Additionally, the fact that future owners must regulate the pace to be able to go farther and certainly it will become a disadvantage for the driving experience

Secondly, it is important to look for a solution of how to recycle batteries. All the respondents consider that the experience of driving an E car is amazing, they are comfortable, some of them even own one but they still consider that to become completely sustainable it is necessary to find a second life for the batteries or at least the proper way to recycle them. It is important to clarify that it is not an end game, there is a lot of space for improvement. It is believed that in the following years there will be technological advances that will allow more choices to replace the engine.

Electric cars are the perfect solution for sustainability in the short term and it contributes so much to the environment but there are still several things that need to be considered in order to replace engines fully.

4.6 Luxury Automotive Industry and Sustainability

The questions regarding the luxury automotive sector and sustainability are fundamental to understand the purpose of this study. That is what is going to be the future of this industry related to sustainability.

Luxury automotive companies have been obliged to shift also towards sustainability. The majority of them have not shifted their vehicles to electric ones because usually those cars are well known for the power and the engine so changing drastically can be harmful for the company. However, due to the different regulations that governments have created to protect the environment, they have been forced to change something within the company or even create hybrid cars even if they do not use the electric battery.

The performance is something that might cause uncertainty but it is proven that the performance will not be affected in terms of acceleration or the experience that luxury cars usually offer. However, one of the notorious changes would be the sound because without a big engine or with an electric car the sound will disappear.

Luxury companies have the obligation to shift to sustainability as I mentioned before. It is also because of the CAFE, the regulation that checks every single company within the automotive sector and makes sure that they are following the rules in terms of sustainability. Regarding the production process, luxury automotive companies are completely different from the mass market vehicles. The production line and machinery are special. Raw materials are an aspect that is important to work on because they have special raw materials that are used and usually those ones are more limited.

Considering that luxury automotive brands are well known for the experience that they offer behind the product, the feeling that it produces for example Tesla might make you feel a sophisticated person and even though they are electric cars, they can offer more speed and acceleration than many others. There is the doubt if luxury cars can have the same performance if they are completely sustainable and according to several respondents, shifting to electric cars will not deteriorate the performance of the car, it might even improve it because of the fantastic power of the batteries. The main problem with this is as mentioned previously is the sound because luxury cars are usually associated with an amazing engine sound. This special feature of the noise can become a drawback for the customer that is a main characteristic of their dream car.

According to everything previously mentioned, luxury companies need to keep in mind, first of all, raw materials and the usage of it and if it is possible start to look for replacements of the

components that are used. Secondly, it is important to fulfil the customer's expectations and maintain their value while being sustainable at the same time in order to offer the best experience but with the added value of sustainability.

4.7 Sustainability Affecting offer and demand in the Luxury Automotive Industry

Due to the fact that people that buy luxury cars are not worried that much about the price, new features on the product or trends such as sustainability have a good response. In this case, the great impact that sustainability has over people can increase the desire to buy cars that do not damage the environment.

However, for the companies it is more complex because shifting to a sustainable mindset and specially changing the process of different activities, it is necessary a big investment and it is important for the companies to find the way to be sustainable but at the same time be profitable and this challenge also includes the luxury sector.

Coming back to the customer satisfaction, it is believed by some of the respondents that if the luxury cars keep most of the features that they have and add the sustainable characteristic they will still buy the car of their preference, the issue would come if in order to make a car

sustainable it is modified other feature, it could affect dramatically the demand because there is a part of the customers that will not be interested on buying this type of cars anymore.

Experience is on the top of the luxury automotive industry, while they keep offering what the customers want and the features that customers prefer, they will maintain or increase the demand on their products because they are adding something else that is becoming a global trend.

5. CONCLUSION & RECOMMENDATIONS

Throughout this study it has been noticed the automotive industry is changing responding to the trends and preferences of the customers. The fact that sustainability is becoming stronger and stronger has made companies wonder what their position is regarding this topic. Companies have started to change several things within their companies, not only in regards to the products or vehicles that they released but also with the entire process of building a car. Several strategies have been implemented in order to respond to this trend.

In this first stage, it was found a short term solution that is electric vehicles, that have allowed at least to reduce the direct impact that engine vehicles generate that is reducing the CO₂ that is

emitted. However, it is just a temporary solution because there is the fact that electric vehicles are still many steps ahead to replace engine cars. First of all, it is necessary to improve the performance of these cars when making emphasis on the distance that they can travel because they are not ready for long distances. Secondly, it is necessary to develop better batteries and find a way to make them more sustainable or find a way to extend their life-cycle.

Thanks to technological advances it will be possible to find out different solutions and it would be much easier if automotive companies associate with companies whose core business are batteries. With this they do not need to think as much as they are doing now about the battery itself and they can start to focus on how to improve another area within the company to become more sustainable.

In addition to this, there is the necessity to have a look at the raw materials that have been used throughout the process and find out other options that can replace at least some of the materials. Hydrogen cars are more environmentally friendly but there is still a big gap in them in order to give them the right of transporting passengers. However, what companies have done until now is to improve in areas such as the leather seats or the steering wheels finding substitutes to make them less harmful for the environment.

It is important to mention that the rapid response from the companies would not be possible without the pressure of the customers, especially younger generations that are looking to help the environment and the planet as soon as possible and as fast as possible. However, there are still traditional buyers that are still looking for cars with big and noisy engines because it is part of the experience that they are looking for when choosing the car of their dreams. Looking at this specific point, the fact that E cars do not offer some of the characteristics that old buyers are looking for, they are offering other features instead such as an amazing acceleration.

Nevertheless, it is known that in order to shift to a sustainable business it is necessary to make a big investment, it means having enough resources or a great budget to shift the business towards sustainability and still be profitable and here is where it is possible to make emphasis on the luxury automotive segment. These companies are well known to have huge incomes and this creates the possibility to easily shift to sustainability. But the major problem that this segment has is that most of the actual buyers focus on specific details that can be modified while trying to become sustainable.

Luxury automotive companies have also to respond to the different regulations that governments establish in the sustainability area, so basically they are sort of forced to shift or at least try to do it and what most of them have done is transforming their automobiles with an hybrid function even if it is never used. However, what luxury automotive companies need to keep focusing on is the special details and the experience that only them can provide to the

customers. In this way, they will be able to change several things little by little but still keep the main idea of the vehicle, the amazing experience and also the performance.

Due to those different transformations there is the doubt if it can directly impact the offer and demand of the luxury cars and it has two different points of view. First, the first one is that it will not have a great impact on the demand because people that usually buy this kind of car are wealthy people so as soon as it is possible to maintain the idea and raise the price but still sell what they want, they will still buy it. But if the experience and the feeling or sensation is changed or directly affected, there is where the demand will be damaged. For the side of the offer, if they respond in the correct way, it will not change much.

To conclude the luxury automotive industry needs to start to think in several changes such as the manufacturing process and raw materials administration, at the same time, considering the possibility to find diverse solutions to bring sustainable purposes within their companies and be able to maintain their business and what they offer that is their amazing experience but being environmentally friendly. Companies need to go beyond what they are doing to generate an impact.

6. LIMITATIONS & FUTURE DIRECTIONS

Despite the results obtained after conducting the in-depth interviews, supplementary research is required in order to understand where are heading the automotive companies in general in a longer term, especially for the luxury segment.

Considering the number of interviews that was 10, it is considered as a small sample for the complexity and narrowness of the topic investigated. Even though they were completely involved with the automotive industry, most of them have knowledge about their expertise or about the area in which they are working. Additionally, the interviews were made to people that have the European perspective of the topic, it would be necessary to analyze if it varies and how much depending on the continent in which they live.

For future studies it would be convenient to also complement it with a quantitative study that would provide other useful information but also having the opportunity to at least interview people from different areas of the company to see if a topic such sustainability is seen in the same way for every single part of the value chain. It could also be beneficial to support the study

with a focus group where it could discuss some of the questions and at the same time generate solutions to several topics.

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