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# WHAT IS THE FUTURE WAY OF AUTOMOBILE CONSUMPTION?

Bachelor's Thesis

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<p>Abstract</p> <p>In the Thesis, the subject is about the evolution of the automobile market. The industry is today a key to the society in term of utility but also about the social link. The Thesis is inspiring by the current evolution of the offer in automobile industry but also by the development of all the society.</p> <p>The needs of today are not the same as yesterday and not the same as tomorrow, so the manufacturer has to think about the mobility offer for the next decade to continue at existing and not be replaced by the new actors in the market.</p> <p>That can be only possible with a new approach to the customer and more care about the relationship.</p> <p>For tomorrow the question is not only about the future mobility but also in term of a global new way to manage the city environment.</p> <p>To make the best plan for the future, the manufacturer has to listen more to the needs of the customer. It can be possible by a more satisfaction focus enlivens by a better customer need identification. The customer experience is the only opportunity to keep the interest on the car industry in a world where the people live in an environment hostile at the car possession.</p> <p>To conclude the study of the market the last point of the Thesis is the factors of pressure by the society. The security of the autonomous driving will define the success or the fall of this technology.</p>			
Keywords Automobile, Car, Industry, New technology, Future, Retail			

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# 1 INTRODUCTION

The future way of automobile consumption is a fascinating subject with a much crucial different aspect of the next global society. Today the automobile industry is an essential aspect worldwide because it represents the first solution of mobility more critical than the railway. The sector goes to its first big revolution since its creation with a new kind of property and utility.

I have chosen this subject for first of all my passion for this industry, in effect I have made my first long internship in this market, and I have notified the importance for every manufacturer of the selling part.

Secondly, this market is exciting now because the sector lives an evolution thanks to the new goal of society. The market knows now its first significant revolution on the retail methods. Since the beginning of the industry the model was similar but now the customer attends the new thing, and the retail has to evolve.

The third part of my decision was the customers now needed in personalisation, for responding to this demand the manufacturer adapts their products in all points, with a new range, using a new kind of production and a new retail concept.

Fourth importance aspect of this subject for me is the aspect of the current re-assessment of all manufacturers. The solution is not decided for a short-term evolution but also for the next 10 or 20 years. The long-term plan is an obligation in the automotive market because it needs much investment and the customer looks forward to a group in capacities to evolve on the future market, these new targets and opportunities represent a further aspect of growth for the current important group. Some company actors of the revolution looking for became new actors in this market as the companies of electronics supplier of the manufacturer, for example, the French company Valeo; the company from the high-tech environment like Intel, Nvidia and Samsung and finally entirely new actors like Dyson, Byton and Tesla.

The research processes for the project were influenced by the need for a global overview of the market. To respond to the problems the best way was thanks to quantitative research. The automobile industry environment communicates a lot on the research process about the mobility of tomorrow. This transparency is an obligation for the manufacturer by the presentation of a project car to analyse the market and the feedback of the potential customer. The second point of the benefit for the manufacturer to have a global view is the satisfaction of the shareholder to show the potential of the company. The disadvantages of research the information by the manufacturer is the lack of objectivity. So, to stay objective on the subject, the critical thing is to multiply the number of sources. To have a more objective point of view the key was the exploitation of articles written by independent media and the study of the recent actuality around the future challenge of the mobility.

In the Thesis, the point of view is very focused on the European and American point of view, is the culture I know and find the article in English is more comfortable so that the conclusion will be more oriented to these markets. The Asian market represents a significant opportunity for the automobile industry. In my point of view is most challenging to have a precise overview of that market, but a global summary is a breach in some aspect of the thesis.

A critical aspect is to analyse the evolution and history of the automobile industry to have a better understanding of the current market.

The automobile born in Germany and France in the late 1800's. First of all, the automobile creation was the unique work of artisan for a favoured customer, the manufacturer creates a model in a kit and the local artisan handmade it with some modification. The only two brands with built and a

commercial part was Bugatti and Rolls-Royce. After this born in Europe, the principal country of growth is the USA in the first half of the twentieth century.

The principal actor of this new market with a goal of globalisation was Henry Ford. This creator of the company Ford was for intent to create a car useful for the family, capable of serving the customers companies and all of this in a compact size. The real reason of the successful for Ford was the cheapest price compare to the other company. In the same time, Henry Ford gives a real priority for the Social aspect with the social syndicate and better condition of works.

To can propose his products at the lower price possible Ford have invented new parts and industrial method: the combustion engine, assembly line, mass production, or interchangeable parts. The assembly line consists for the worker to don't move from their working place, but the solution is to have the car at the right place in the right moment in the factory to pass all the step of creation. The interchangeable parts permit for the group to invest less in the research part with the reusing of some role, but the economy is not only in the research but also in the stock and this permit to improve the reliability of the car with upgrade parts.

Between the creation of Henry Ford and today the automobile industry became a success story and an essential part of life for everyone, now the organisation of the society is very focused on the automobile using.

For the report, the first global point is the Evolution of the owner experience, in effect the real mission for the automobile brand is to create or find a retail network of quality to respond at the customers demand. The retail system is the base of the relationship and the final point of all the process. Indeed, the creation of a new range of products can be only a success if the retail network understands the values of the products and pass it.

To clarify the experience and proposition is essential to look at from the customer's point of view. In this vision, the base is to identify the current offer available for the final customers to after looking at more the new opportunities and evolution of needs. The central aspect will be to understand the importance of the brand image and the development of perception, this by a study of the recent worry about the gasoline with the example of Volkswagen.

To continue the analyse is crucial to shedding light on the retailer point of view with the evolution of the customer's experience. Now a customer comes to the retailers with all the information found on the internet directly at home. Thanks to this new way of consumption, the retailers have to adapt their offer and have a commercial approach adapted. The communication needs to be more focused on the financial and guarantee aspect. In relation with this, the infrastructure is adjusted with more interaction and individualisation. The new principal value of the retailer is the loyalty of the customer, to create more visit from the target the retailer organises of event and action reserve to the loyal customers but also for the customers interesting by competitors to show the value of the manufacturer and to show off the products.

In all the previous point the current evolution is the needs of many people to have a personalise products and experiences. These new needs revolutionise the management of ordering the car and is the opportunities to reduce the working capital requirement thanks to the reduction of stock for the retailer. The chance of creating more personalise car respond correctly to the customer's needs with attending of differentiation. Study the opportunity to propose the more global solution is a key growth point for the manufactures to suggest maintenance and service. Now the customers looking for a car with a defined budget and are not ready to have a surprise in the monthly cost.

After studying of the owner experience, the other main point of the evolution is the new kind of property adopted by the customers. This evolution comes on after 100 years of an unaltered model where the customers directly paid the car in cash or make the loans to a bank.

A loans market is one of the most profitable markets for the bank, thanks to this analysis all the manufacturer decides to create their solution with the creation of a financial brand.

The new solution promoted by the retailers offer at the customer an opportunity to have less expensive loans and another answer very different than a standard mortgage. The best example is the leasing where the car stays the property of the manufacturer, and the customers rent an availability within the beginning number of kilometre specific and residual value.

The primary mission of the automobile industry today is to respond at the new urban challenge, is not possible to continue in a society where all people keep the property of their vehicle, the average user of the car is one hour per day, this is less than a smartphone user. For responding to this problem, the manufacturer creates a new solution as BMW with DriveNow that is a service of a rental car for a little utilisation. The current evolution is now only the beginning of the service development and the opportunities for every manufacturer.

However, to create new opportunities, the manufacturer needs to understand the new habits of the society. The base of my study it's to understand the new influence in the market and the new priority for the young generation.

The new more powerful company today are all in the technologic market; the principal one is the GAFA: Google, Apple, Facebook and Amazon so these actors are in a capacity to integrate a new market very fast with much investment.

The new central evolution of the market is the use of data by the manufacturer to define a target and to adapt the offer and product portfolio.

With the exploitation of this data, the manufacturer has identified a new trend of the society. For the young generation, the car became less attractive.

## 2 EVOLUTION OF THE OWNER EXPERIENCE:

In a manufacturer point of view, the communication is the main point of development.

In the past 100 years to create a car the manufacturer work in a secret to test and improve their models always with the goal to create the perfect new vehicle. This testing and improvement part needs a lot of research and a big budget. After the development part, to introduce a new model the manufacturer organises public event with some conferences in an international motor show.

For example, since the 60' the best way to sell a car in Europe or America was the reputation of the brand in motorsport race.

In the USA it was for a long time the Nascar competition born in 1947 who now represent the premier motorsports organisation. Ford was the first prominent manufacturer to integrate and win this competition join after by manufacturer like Chevrolet, Dodge and recently Toyota. In the USA this competition has enough importance to affect the sales of a vehicle significantly if it is successful in a race.

Nascar concern America but in a more international point of view, the FIA World Endurance Championship represent an opportunity for the manufacturer to communicate but also to test new technology. The WEC race represents the manufacturer the most challenging way of promotion, the track is very demanding in term of a financial point of view but also for the drivers for two reasons. First, all-race is in track very strict as Daytona (USA), Spa-Francorchamps (BE), Nurburgring (DE) or Le Mans (FR)

Secondly, because they have a different duration with from 6 to 24 hours of a race so is not only a question of speed or best drivers but more questions of regularity and reliability.

Their type of competitions gives an image of the manufacturing capacity to several millions of potential customers.

Now with the new development of the internet, the information come faster and from billions of people. For the brand is more and more challenging to keep the secret in their new model. To take care of the confidence, the manufacturer invests a lot with private test centre and adopt a policy of silence inside the company.

After all this work the manufacturer passes the mission of selling the car to the retailers.

The main point of speaking of the owner experience is to understand the customer. The purchase of a car for a customer is, in general, the second largest investment. This notice explains why this choice is so important and can be solved by the difficulty of decision in a market with an overmanned proposition. What the stress procure by this purchase is amplified by the rapidity of this purchase, in effect when a family buy a house is very long with a complicated process and they have plenty of time to take the final decision on the contrary of the car owner experience. To secure the trust of the customer the car industry has to improve this experience and transmit a better feeling after a purchase.

For improving this experience, the first main point was to identify where the customer fills losing in the process. After research the study main by Deloitte Digital and Adobe identify five points of stress:

- Information:

During the time of the decision, the owner has a multitude of information coming from everywhere and with contradiction. For an owner without automobile expertise the multiplication of the data sometimes incomprehensible it will be very complicated to choose with reason.

- Contact:

The image of the retail market is in pain about a bad reputation because in this market very often the customers have a feeling of influence in their choice. The target of the salesperson is to help in the decision but not to influence to keep the satisfaction.

The primary goal stays for the salesperson to aware of the customers' needs and what he or she is interested. It can be helped by the relationship the retailers have with the customers; if they arrive at create an environment of trust, it's easier to make a deal.

- Purchase:

The final step in the car decision is the purchase process. The stage is very demanding for the buyers with plenty of document and choice in a rush. During the purchase the buyers have to take the final decision, try to make some negotiation, signing the contract and complete all the purchase documents. All this step requires much attention, and the customer can feel losing.

- Handover

Buy an all-new car for a customer is always an experience, the benefit is to perfectly choose a model in link with their needs correctly, but after the purchases, the car can take several months to coming. The waiting period can be very stressful for the customer who not understand why the process is lengthy. The critical point for the retailer is to communicate to the customer all the step of the car production to offer the best experience possible.

- After sales

From regular maintenance to a big issue the after sales services can represent much stress for the customer. The buyers have very often a feeling of abandon and are scared of an overpriced repair. To resolve these feelings the retailer, have to take care of the communication with the customer to guarantee the satisfaction.



## 2.1 Evolution of the current market:

Base in the customer's point of view, the owner, has many choices offered to respond at their attend in this market. With the current market, the option is very open with old and new kind of consumption which is today complicated to differentiate. The primary target of the manufacturers is the communication to transmit a right image. To respond to this needs the company take care of the global evolution of the customer's needs.

In a usual way of consumption, the customers going to a retail place to choose a car new or used. For this old kind of waste, the customers except for reception of quality from a professional staff ready to support his choice. This work of advice is a base of the customer's satisfaction due to the difficulties to know all the offer and the opportunities of personalisation offered by the manufacturer. The new personalisation offer come from luxury and premium market, but now thanks to the social evolution are now available from all market. This new kind of consumption was already criteria at the beginning of the car industry where the automobile industry like Bugatti or Ferrari has made the car unique for all the wealthiest customer.

The first global manufacturer at propose personalisation offer for the mass market was Mini at the beginning of the 2000's after the purchase by the BMW Group in the goal to offer opportunities to the customers to create a car really in link with their needs and relationships with their personality. The choice can be by colour, stickers or shape more luxury or sportive oriented. Today this politic is retaken by more generalist manufactures like Fiat or the PSA Group to offer value in their car in the small range as the Fiat 500.



FIGURE 1. MINI Historia (2017.)

The choice is now also complicated thanks to the multiplication of the offer regarding option. The first aspect is the explanation of technologies offered for security, entertainment and assisted driving. The retailer has to understand the customer to provide the best option.

In a retail place, the customers profiles are very different, but all can be regrouped in five types common to all the industry:

- **Loyal Customers:** this represents the for the company the perfect pattern of the target. They are challenging to attract and need a lot of argument and advertising. After this part of the attraction, the customer loyalty is the key point to transfer a regular customer to loyal customer.

This type of customers is after the attraction part the less expensive target in marketing to convince. This customer is also the primary target if the retailers want to test new products and they can interact with these customers to have critical feedback.

- Discount Customers: this represents a specific target and don't match with all the company objective. This client only research product less expensive possible or with the best value. To attract these customers the company, have many possibilities to make promotions; loyalty programs with advantages or similar price promotion can works.
- Impulse Customers: challenging to manage but an excellent opportunity for the company. This type of customers is very sensible at the reception to procure by the staff and very looking for a product to obtain sensation. The challenge for a company is to be prepared for welcoming this type of customers, for this, they need the products available very faster and a great proposition.
- Need-Bases Customers: during a rush, it's a very complicated customer at manage. Their specific aspect is perfect knowledge of their needs, and an attend of fast service. In the automotive industry, these customers are very often. The retailer can recognise this type of customers easily because it is never impressed and he all-time know the specification. The only value at an offer for this clientele is a personalise welcoming and a quick suggestion.
- Wandering Customers: a significant percentage of the visit but a tiny percentage of the sales. These customers have difficulty to take a decision and need to compare all the offer. The customer can acquire the wandering profile after a bad experience. To satisfy the attempt the retailer has to take care of providing precise information and experience base on thrust.

The five profiles represent a challenge for the retailer, some brand doesn't have a potential customer in all the pattern but have to take care of satisfying all. For this, the retailer proposes a lack of the option to have a new base price and a top model with all technology and new features.

After all the profiles the automotive market also has two main group of customers with different needs:

- Utility purchase: the primary target of the mass manufacture, the investment is for the customer only a respond of a needs; the interest can be for a society or private use.
- Passion purchase: the customer of more premium brand, the buying decision are influenced by the vehicle by himself with plenty of technology and cars with high performance.

The response to all the attention is for the moment the creation of new offer. All manufacturer to respond at the market propose now SUV or Sports Utility Vehicle and offer of more sustainable engines. Evolution of market also completes the global development of products.

Since a decade most manufacturers have added an SUV offer to the portfolio. The reason of that is the new interest from the customer to this body shape. In most of the country, the SUV represents the first or second segment on the market.

Despite a look of off-roader the majority of the SUV never go outside the main road and are two-wheel drive, so the benefit is in another aspect.

- The storage place, the SUV procure to the family the best offer in term of storage.
- More comfortable to access, the high ground clearance offers access with less effort, less pain and more dignity.
- Versatility, the SUV can be used in all environment as city, country-side or stressful situation.
- It looks, if the customer is a family, the SUV is the only offer to procure a nice-looking car.

The creation of SUV in the portfolio doesn't concern only the mass manufacturer. Today all luxury brand creates an SUV in the range, the pioneer of this was Porsche in 2002 with the Cayenne. The launch of the first Cayenne for the brand help to multiply by two the sales and to touch new market. The SUV model is viral in America first but also in a new market as Asia, Middle East or Russia. After the success of Porsche other brand have created a similar model to Land Rover, Bentley or more recently Rolls Royce and Lamborghini.

For all the luxury brand the goal is to touch the new potential customer. The number of young millionaires increase very faster and are the perfect target for this type of offer. Brand as Ferrari and Lotus will follow the other manufacturer to offer a proposition of luxury and sportive SUV.

The benefit of the new trends in the premium German brand. BMW, Mercedes-Benz and Audi represent 80% share of the global luxury car market. Products of quality with high reputation can explain the success of his brand, but the real reason for the success is the customer's experiences. The manufacturers listen and respond to the customers need with the most significant portfolio of products with recently a lot of SUV proposition.

In addition to the SUV proposition, all manufacturer proposes now a new initiative to have more sustainable vehicle adapt to all mobility. Most people using a car for mobility needs and not passion, so the advertising now is based on the consumption or the emission than the performance of the vehicle.

New diesel or petrol engine: the manufacturer invest a lot to reduce the consumption and the CO2 emission of all the vehicles. The reduction can have two areas of benefit; the first one is the sustainable impact of the car. We all know the influence of the car emission on the environment and reduce them is a priority. Secondly, the coast of the vehicle in a long-term view, refuelling a car is in most countries with high taxes very expensive. In addition to that especially in Europe, the state adds charges during the purchase process base on CO2 emission so reduce them reduce the fees and help the car to be more competitive.

New electric vehicle's: Popularise by Tesla with the Model S in 2009. The technology growth very fast and must of the manufacturer research on that way. Some government in China will obligate a percentage of electric car sells for every manufacturer.

The advantages of the technology are:

- Replacement of the Gas dependence: Gas resources are limited, and the consumption continues every year to grow. The use doesn't come only from the automobile industry, but it's a big part, so find new solutions of power for the car industry will resolve a lot of social and economic problem.
- Save Money: For the moment the coast of possession of an electric car are significate lower than a typical car. The beach per miles is smaller thanks to the price of the electricity compared to the gas. Finally, for the beach, the taxes are very low and in most of the country the state help buyers of an electric car.
- No Emissions by the car: The car by itself reject any emission during the using process, for the city environment, this can be a solution for a green city.
- Low needs for Maintenance: The electric car doesn't have a mechanic motor, so the car doesn't need any maintenance except the consumable as tyres and brakes.
- City-friendly: Thanks to a low noise volume the car permit to create a more pleasant environment and as mention, before thanks to the electric car the city is now breathable.

The disadvantages of the technology are:

- Dependence of recharge points: The electric car has still a low range so for a long trip, stop is obligated. For the moment volume of an electric vehicle is near to 5% of the market, so the infrastructure is still in deployment.
- Payment of the electricity: The Electricity for the moment have a shallow coast for recharge car, but in the future, the state could add taxes. For the moment the road infrastructure is paid with

the gas taxes but if too much people use an electric car the electricity for an automobile use will be taxed.

- Time of recharging compare to a refuelling: Electricity technology are very young and for the moment the recharging time is very long compared to a gas car.
- Buying price: the technology is not mature, and the base price of an electric car is very high compared to a low-price gas car.
- Electricity production: The last significant problem of the electric car is the production of the electricity. In effect to create power some country still uses coal or gas, so the environmental interest is low but if the voltage comes from solar or wind technology the carbon impact is non-existent.

New hybrid solution: Introduced by the Toyota Prius in 1997 to the mass market, the technology is based on the combination of the two previous techniques. The fuel engine stays to offer at the car capacity to make a long trip, and the electric motor is here to provide a sustainable opportunity for the short trip.

## 2.2 Evolution of the retail

The customers' expectations and interest can explain the evolution of the retail experience.

The goal of a retail place can be spare in a very different step where the customer needs to have an experience of quality.

To understand this market a SWOT analysis is perfect:

<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>- Guarantee, the manufacturer-retailer offers a guarantee of quality in service and maintenance. The warranty of high-quality product is also an obligation in the used market where the retailer-manufacturer provides two years guarantee.</li> <li>- Monopole, in the new car market the manufacturer retailers have a monopoly of the offer, but in the used market the value is the service offer.</li> </ul>	<p><b>Weaknesses:</b></p> <ul style="list-style-type: none"> <li>- Price, the retail has concurrence from a lot of new actors as the import company who import a car from the country where the rate or the taxes are lower, so the standard retailers can compete without other value. Besides, the retail has to fight with a private seller who sells the car without any guarantee on the vehicle and the payment.</li> <li>- Competition, entirely new actor creates a market where the retailer is not useful anymore, the future can be a total transformation of the retail market.</li> </ul>
<p><b>Opportunities:</b></p> <ul style="list-style-type: none"> <li>- Newmarket, car mobility knows much evolution, and this creates a new market where the retailer can respond. The key to taking profit of this is the adaptation and the respond to the customer's needs.</li> <li>- Service offer, the new needs of the customer have created opportunities for a full package where the retailers sell a car but also all the services in link with the vehicle.</li> </ul>	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>- A new channel of distribution, the retail structure is challenging to integrate, all around the world, the retail group became bigger and bigger, so the market is no very close for new small actors.</li> <li>- Customer expectation, the customers became more and more selective, so the retailer has to put in place strategy of communication.</li> </ul>

### 2.2.1 Sales

The first relationship with the dealership is in the majority during the sales process. The first contact is the most important.

For responding to this pressure, the retailers have to take care to the presentation of the vehicle. The visual part needs an adaptation in link with the brand and needs to have a goal of responding to marketing process:

- Targeting: In the automobile, industry retailer is interesting by all type of customers, but all manufacturer has the main customer target at taking care. To touch this opportunity all point is

essential, to manage the presentation the retailer have to choose a different type of car to respond to the needs. To reach the target, the retailer can select the different channel of marketing to attract people. For the mainstream brand, the primary way to attract customer is the essential advertising with publicity campaign base on price attraction. The second way of communication for this type of brand is the organisation or the attendance at a local event like the trade show. For the premium brand, it's very different way of communication, in effect the brand organises national advert to promote the product by sensation and not base only on price comparison. Secondly, the premium brand in a local environment organise a special event for selected customers; all this process to keep significant loyalty level.

- **Segmentation:** In the offer, retailer proposition has to select a segmentation. In all brand, the portfolio responds to a different segment, and it's the role of the retailer to propose a clear overview of all the possibility and advice in the best choice for everyone. In the retail place, this can be notified by the clear separation of all the offer. Most of the prominent automobile manufacturer posed much different brand without a shared segment. So, the retailer who represents a group as Volkswagen has to separate all the brand to offer a service in link with all brand. It notification reside on the creation of real limits, in effect if the retailer who represent the group Volkswagen he has to separate the brand Audi from Volkswagen at Seat and Skoda.
- **Positioning:** In the creation of the showroom a retailer has to think about the local target. In effect, the positioning responds to the brand demand, but this is not enough. In fact, in the ordering process, the companies have to analyse the region habits and think about which product match with the local customers. The best example for this is the difference between the American and the Asian market. The American market research only big vehicle with a powerful engine so for this, the market is concentrated on the S.U.V vehicle. On the contrary, the Asian consumers look at for sedan or small S.U.V with a small petrol engine and the premium car. The middle class from Asia look at for long base vehicle with driver in a city where driving doesn't mean pleasure.
- **Product Strategy:** For the retailer, it's essential to propose a massive panel of a new car, but it's also necessary to suggest different solutions and products for the potential customers. The presentation of the products has to give a clear message to the customer. In this point, the focus is in the commercial practice. The brand has to adopt the selling methods to the target. In general, the manufacturer can create with retailer partnership a clear strategy with a functional capacity of evolution for every need. The retailer has to analyse the customers to know if they are more interested inabout the financing of the new car, the new technology or the sport's capacity of the vehicle.

All the previous points are only possible if the sales team have a good understanding of the retailer goal and if the club is efficient.

To procure the same experience for all customers, the manufacturer organises a section of formation mandatory for everyone.

The customer experience is a big focus for the premium market, and now the customer attends a quality of service very high. The work of retailer has moved to a regular market where the sales were in the centre of the preoccupation to a market of service where the retailer offers one to one experience.

### 2.2.2 Customer experience:

- **Establishment of the new roles to respond effectively to changing customers' needs and new technologies:** The customer looks at for total new experience. According to the research of the EY company 80% of customers use multiple devices to research a vehicle purchase, and 52% visit the dealer's website during the purchase process. Now the retailers have to take care of the

internet reputation and visibility to touch a most significant target. Must on the used market customers now have clarity around all the country, so the retailer has to show a difference compare to the competitors. The respond of this by the manufacturer is a label of quality imposes at the retailer.

- Improvement of the customer experience at the dealer: The Future of the retail will stay with human relationship, in most of the case the crucial fact after a buying experience is a relation with the seller, but the retail environment and service can help this. Now the retailer proposes much distraction for the customer in the buying process but also in the aftersales services. The context of retail has known many upgrades with more accommodation. In the package of the premium brand, the customer has now lounge area where they can wait with TV, internet connection and coffee. In my experience, the most critical moment for the customers was the delivery process. To organise the delivery the retailer has now a showroom where the car is cover up and where an assistant presents all the features of the new vehicles, all of this enliven by a little gift like champagne, chocolate, flowers or all other attention.
- Significant data management to respond to the customer's needs: To understand their target the retailers use data information to follow the market. A situation of the automobile market has published all mouth with the sales volumes, and the specifications of the vehicles sell so thanks to this the retailers can notify the evolution and new trends to make the excellent decision of purchase and to target the right goal.

### 2.2.3 Aftersales:

- Customer satisfaction and loyalty: The aftersales are the most crucial part of the retailers in term of satisfaction and loyalty. In effect after the sales process, some troubles can happen, or just the maintenance part need to be a success. After the sales process, this part is the only relation with the customers left. The assessment of the aftersales is the needs of perfect quality service possible with a formation and clear communication with the customer. An excellent aftersales service can help a loyalty program.
- Leverage mutual potential of sales and after-sales touch points: An excellent service in sales can be dissociated to a high quality of aftersales. The two department of the retail has a synergy together, so the roles of the manager are to combine these two aspects to work together.
- Improve the choice of personalisation by accessories: A decision of a car can be tough in the selection of the options process. To respond to the mistake in the configuration must of the manufacturer propose a solution of personalisation of a car and aftersales option. , and the offer is vast with some high-performance parts to give at the customer an opportunity to have unique personality car.

### 2.2.4 Retail network:

The retail system is very organised, and with the new customer expectation, the investment is too crucial for private possession. Now the market is hosted on group policy where the retailer is a member of a group with enough power to can have a favourable relationship with the manufacturer combine to a global group point of view to create synergy between all the retailers.

- Multi-channel approach: Group of retailers have enough financial power to put in place new website where the potential customer can see the group offer and policy. The power of a group

can also be the organisation of the event to improve the customer loyalty to show the products and keep the communication with the actual consumers.

- Offer mobility as a service: A group can offer a solution of service in a local area. For a big city, the initiative can be leading by the manufacturer directly, but in a smaller town, the key is the knowledge of the market. The retailers can be a part of the community by the creation of city mobility with for example proposition of just-in-time rental.
- Training and coaching: The opportunity of a retail group is to organise more personalise training to adapt the management to the local area. The importance to stay with a high-quality service can be possible with a micro-management of the team where all manager knows very-well the attend and the capacity of everyone.

Some brand tries to revolution the market like the example of Tesla.

As in the figure on the bottom, the retailer place of Tesla has a very original format. The usual retailers have an essential area of the showroom place and many sites to stock the all-new car. In the contrary Tesla work in just-in-time policy to never have stock. Thanks to this Tesla open retail place in a commercial centre or on the city where the potential customer can see only one car in real complete by a complete configuration of the vehicle with screen and the help of a seller.



FIGURE 2. Auto dealer groups escalate battle against Tesla stores (2018.)



## 2.3 Respond to the customers' needs

Now the retailer and the manufacturer have to work together because the customer expectation will evolve more in the next decade, so the work now is to create an all-new model and not just make evolution on the current one.

- **Managing trust and customer cycle:** The faith was a big problem in the automotive industry since the decade. Some profiteer has transmitted a lousy image of the sector with an issue of delivery, inferior after sales and any care about customer satisfaction.  
The best communication for a retailer is the customer recommendation, people with good-experience can give a feel-back to their friends or family, but this is stronger on the contrary, in effect, an unsatisfied consumer has very high importance.  
To reconquer the trust of the customer the key is the communication and the clearness of the offer. For a customer is very frustrating never to know if he has made a good deal or not. To respond to the problematic premium brand as BMW or Mercedes-Benz never made significant discount but can cause some offer on financing solution or upgrade.
- **Digital experience:** The opportunity for evolution in the future can be for the automobile retailer the digitalisation of the experience. As for a many market car industry know a real expansion of internet buying. The principal way of communication for most of the retailer is in the professional platform to propose vehicle. However, the next step well coming soon and are already possible for any manufacturer is the buying online of an all-new car. A company like BMW i propose today at the potential customer to go on a unique website where people can configure and directly order a vehicle. The best example of the new experience possible is the BMW i Visualizer app where the potential customer can look thanks to a smartphone the configuration of the i3 in the condition comparable to a real observation.
- **Redesigning the retail place:** To respond to the rapid change of customer expectation the retailer will have a politic more oriented to the flexibility to can follow all trends. The future of the retail place can be the transformation to a test centre where the customer comes after having chosen a vehicle on the internet to take the confirm of his choice. In the new environment of sales, the infrastructure will be more oriented to the personalisation of the car with digital experience where the customer will be able to see the car configuration in life.  
However, what does the future proposition offer by the retailer:
  - **New distribution formats:** Install new retail place more original can permit to touch new customer like Tesla with retail on commercial centre.
  - **Hybrid experience between real and virtual:** The retail place will be having some model to show car in real, but an opportunity can be with virtual reality to teach at the customer his future vehicle with all the options.

The key for the retailer is in the future to have more relation with directly the manufacturer.

However, now the market will know a revolution with new powerful actors of distribution like Alibaba.

Alibaba is a very known internet retailer in the Chinese market but now also all worldwide with low-cost products and fast delivery.

It can be difficult to see why a company as Alibaba are attractive by the automobile retail but for the moment it was a market very close, so the opportunity is significant.

For the first initiative in retailer industry, the group have chosen to make a partnership with the American company Ford.

As mention in the previous point, the future of retail is test centre in combination with website interface; this is precisely the policy of Alibaba. The offer is an opportunity to make a three-day test drive with a choice of more than 100 vehicles.

The politic of the company according to the Alibaba website is "redefine the consumer journey and user experience for automobiles".

To create more interaction, the customers not just pick up the car but also thanks to the Alibaba application they can have more information about the model and can ask a question to a helping centre. To only have exciting people a symbolic paid is demanding.

The second application of Alibaba for the manufacturer is a broad portfolio of the customer with a very detailed profile. Thanks to the data Alibaba can help the brand in the target focus and also can transmit the customer expectation.

The experimentation of initiative as this one in the Chinese market represents a lot, is a very recent important market with continued growth and the new retail methods can help the integration of the automobile in the every-day life.



FIGURE 3. Alibaba first Ford test drives (2017.)

Initiative comparable exists in Europe and to be more precise in Germany. In effect, Lidl propose a solution of a retailer for the premium brand.

Lidl is a discount food-retail brand created in Germany and now implemented in a majority of the European country. A partnership between the group and premium manufacturer can look strange but today is the case.

The contract is oriented to the detail of the company cars, so this means used car with low mileage and very recent for a price reduction around 40%.

The partnership is for the moment with Audi and BMW.

The crucial advantages offer by brand as Lidl is the network of sell point within German 250 stores on the program for a minimum volume of 10,000 cars per year.

In all the previous examples the retail format is in peril, and the evolution of the automobile business can be in the integration of entertainment on the autonomous car.

The new challenge on the next Century can be to offer quality time on the mobility solution so to respond at this needs company will provide the experience of diversion.

The example of the new opportunity is integrating on the project car Mercedes-Benz F 015. Is a total autonomous vehicle with an interior very comparable to a saloon?  
In the interior as a digital living space, the passenger will watch a movie, listen to music or surf the internet.

The most stressful part when customers buy a car is usually whom to pay for it? A car is expensive, often the most valuable thing a family own. However, it was not always like that, why the car is so pricey?

As mention in the introduction, the first mass-produced car was the Ford model T. In 1908 this car was sold for \$825. Year after year Ford improves their line and their efficiency to reduce the price thanks to this in the last life of the model T the price was \$325. With a comparison to the actual dollars the amount of the model T beginning in 1908 at \$23,000 and finish at \$4,300. Henry Ford, thanks to this politic, create a car whom everyone can offer. This combined with the new industrialisation create a middle class. In the 50's the USA was in a very dynamic movement, the Post-war economic boom doubled, and even tripled wages compared to 1938. When adjusted for inflation to today's money, the median income in the USA was around \$52,000. Like today in the USA the most demanding vehicle was the F model pickup from Ford, in 1950 it was the first one to sell for \$1300, or about \$14000 for today. For a base F model by Ford, the price has nearly tripled in its 70-year history.

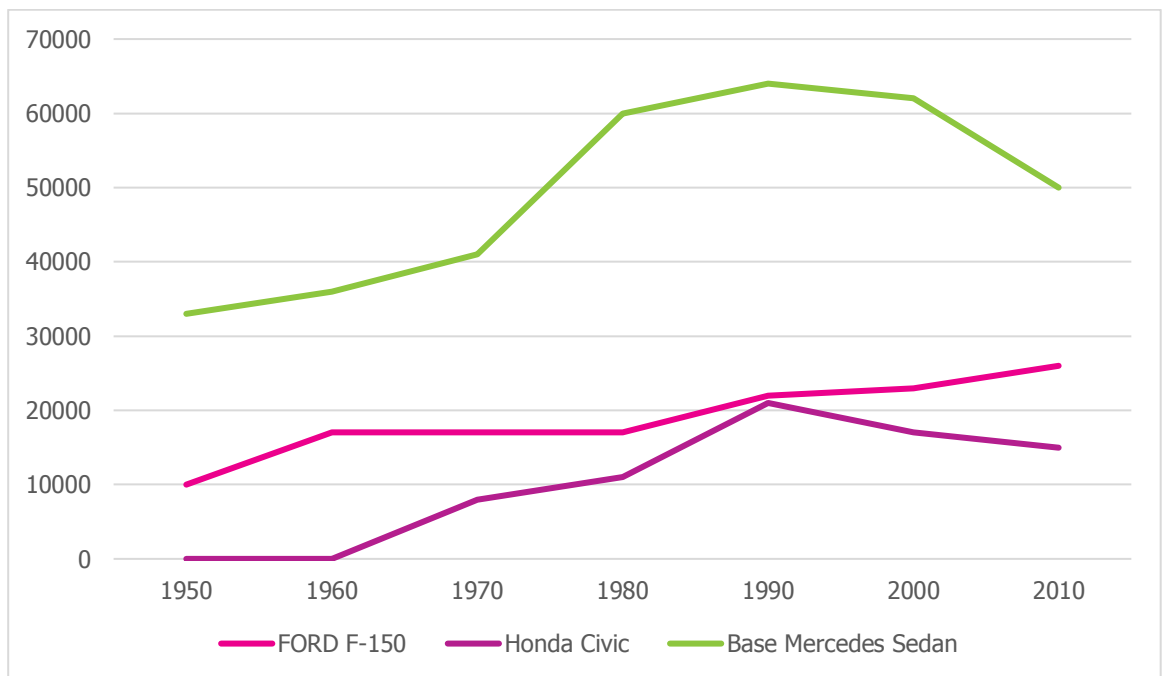


FIGURE 4: The base model price for an F series truck (Dollars Adjusted for Inflation) (2017.)

This graphic show that the case of the Ford is not unique, pretty much every model of car has seen an increase in price about double. The change of the expectation can explain it from the customers the Ford F-1 in 1948 had only 95 Horsepower and was not delivery with some hight features as the radio or air conditioner, but today a base F150 have an automatic transmission, a V6 engine of 290 HP, power steering and of course air conditioning.

The security features are also the critical point of explanation for the increasing price of the car. Old cars were horrible on safety. The old vehicle completely collapses in a collision when the modern car has a definite structure incapacity to absorb the shock, combine to the air-bag the driver and passenger are insecurity in a recent car.

To have an example of what the essential car have today the perfect example is the cheapest car in the American market: the Mitsubishi Mirage. This car has in series features like touch screen, rearview camera and attractive chrome grille accents. All of this for \$14000.

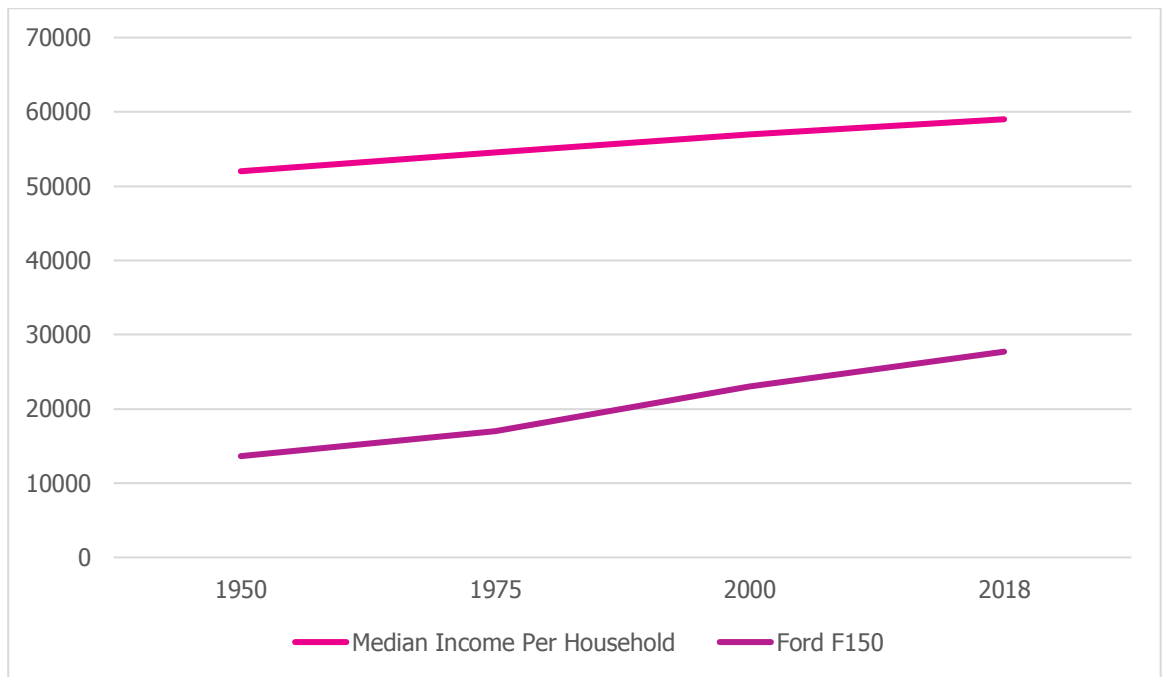


FIGURE 5: Median Income per Household and base price Ford F150 (2017.)

When the median income was increased by \$7,000, the base price of an F150 was increased by \$14,069. In comparison buy an F-150 in 1948 cost 21% of the annual median income but today the same operation cost 47% and if an American customer buy the F-150 super crew cab a model more adapt to the family this cost to us 61% of the annual median income.

The response to this in the USA is a more common using 74 months loan and now loans also up to 96 months.

According to the Credit Union of USA, 31% of the loans in 2016 are for 73 months or more when it was 12% in 2009.

It is the respond of the USA market, but another solution exists?

### 3.1 New financing methods

As mentioned in the introduction of this point, the financing is one of the most challenging decisions made by the customer. Now the majority of the customer look at financing methods when they think about buying a car. According to the website [debt.org](http://debt.org), 85% of new car purchases and 53% of used car purchases use a loan in the USA for an average duration of 69 months and \$30,294. The acquisition represents a necessary amount of money, so the solution of financing is limited. When customers finance a car, the critical thing to remember is if they buy a car at \$30,000 they also paid methods of funding so finally the car cost is near to \$36,000.

The historical and most used currently kind of financing is by loans. This offers to the customers the opportunity to finance a car faster and easier than other methods. When a customer wants to go to the dealership, the critical thing to do is to study the capacity of monthly budget and the duration of the potential loans. Now 46% of the buyers' research solution of financing directly on the internet.

The different kind of solution:

- Banks: they represent still 33% of the market, but now the banks are very more selective to attribute car loans and ask for a strong guarantee. If the customers have an excellent financial situation bank financing stays the more natural way for a further car.
- Credit Unions: Many people are a member of a union, and this can give an opportunity to have loans at a lower rate than the regular bank. According to [debt.com](http://debt.com), the credit unions solutions touch 21% of the financing methods.
- Online Lenders: Now a big part of the customers go on the Internet to find the best offer of loans for these new needs some sites were created as LendingTree, MyAutoLoan or Clearlane. They offer to the customer a global point of view in all the offer to make the best choice for the best price.
- Car Loan Comparison: When families decide to take loans in most of the cases they define a budget for a monthly payment, and they choose of the duration, but the result is not the car budget but a global budget with taxes, title, fees and interest. In the choice of this budget, they can be helped by a company to decide on the best option for their profiles and in consequence to know the exact car budget.

When the monthly budget and duration are fixed, customers have to decide between a New or Used car because the loans specification can change a lot.

When they buy a new car, the difficulty is the loss of value in the first year. When comes the moment of the delivery the vehicle already loses between 10 and 20% of their value. After this, during his first year, the car loses again between 10 and 20%. The challenge of this it's to repay the bank in case of a problem because after one or two years the owner has paid less capital than the loss value of the car. That can encourage to buy a one-year-old car with already a depreciation of 20%.

The advantages of buying a one year old car in a manufacturer-retailer are the guarantee very similar to the one offer for an all-new vehicle.

Finally, the benefit to buy a used car is the net loss after the loans. When a customer buy a new vehicle with credits of six years the value of the vehicle represents only 30% or 40% of the initial value while a used car value after the loan represents 50% or 60% of the initial purchase price. To study the loans solution more in detail the better solution is to look at the offer of a manufacturer here the example of the BMW Group:

Now all the car manufacturer has a financial services division to propose at the customer a solution of financing directly in the purchase process.

For the BMW Group, the division is BMW Group Financial Services.

As all the group the division show an interest in the customer loyalty, in the premium market the critical aspect of development is in the first point to gain the reliability of the customer to secure the market before the target of conquest the customer of another brand. For this mission, the group employ 8,000 employees worldwide to take care of the customer satisfaction.

For the private purchase, the customer is taken in charge by the BMW Group Financial Services with a solution of financing and leasing for all the automobiles and motorcycles of the group.

For BMW this activity represents today 4 million of contract worldwide in 54 countries and 20% of the total Group profit. In the total sales, 45% of the purchase is with a financial solution.

For the purchase of one series for examples the Group propose different solutions:

- **BMW Select:** the contract is based on a first deposit defined by the customer. Follow by a monthly payment between 24 and 48 months for a new car and between 30 and 60 months for a used car, and finally, the customer has two solutions buy the car for a price of a used car define in the contract or just ending the contract. The agreement offers to the customer flexibility and low monthly payments. However, when the customers calculate is essential to don't forget that the car is not their possession at the end. Another difficulty in the contract is to define the average mileage; it's critical to the agreement to have this information to determine the value of the car after the deal.
- **BMW Hire Purchase:** A regular loans as can offer a bank, but this not represent the original offer of the Group subject to a harder competition than the other proposition. What the advantages of this offer compare to the BMW Select is the lack of mileage restriction, and at the end of the monthly payment, the car is totally paid and the possession of the paymaster. As for the previous methods, the contract is between 24 and 60 months, and the customers needs to pay a deposit in the beginning. The main advantages of this offer are the simplicity.
- **BMW Contract Hire:** As the BMW Select offer the contract is based on a monthly payment for a define average mileage. The difference is for the deposit first because in this case is a first-month payment more expensive to replace it and secondly in this contract the customer doesn't have the opportunity to buy the car at the end.

The financing part is today essential for the manufacturer and represents today a key point of attraction of the customer thanks to the communication campaign.

In addition to all this financing solution, BMW also proposes a solution of assurance and maintenance to offer a global package for the customers to assure a perfect tranquillity during all the financing time.

PERSONAL CONTRACT HIRE

BMW 520d M SPORT  
SALOON.

**MONTHLY RENTALS  
FROM £369.**

(plus initial rental\*).

[Explore this offer](#)

BMW (UK) Ltd is a credit broker.  
\*£6,819. Terms and conditions apply.



FIGURE 6: BMW Finance Offer (2018.)

The BMW Group also propose more solution for the professional customer with the Brand Alphabet specialises in fleet management.

The goal of Alphabet is not only managed the financial offer but offer a global suggestion of business mobility to respond to specific company requirement. As all the group Alphabet has the only goal the customer satisfaction, the professional market is more difficult to satisfy and gain the loyalty need much effort. To can respond to all demand the brand of BMW can offer a solution with vehicles of any manufacturer even the competitors of the parent company.

The offer is a divide in three aspects:

- Tailor-Made services, all the customers have a personalised service to adapt and respond to the challenge of everyone business.
- End-To-End consulting, to help the company at responding to the mobility challenges like sustainability, possession coast and ethics.
- Offering manufacturer-independent products, to have a more global offer Alphabet propose all the vehicle available in the market to provide the comparable products.

Alphabet proposes a full-service portfolio to the company, the management of a fleet don't only mine the financing of a car but also organise the maintenance and more global services with for example the fleet electrification offer where Alphabet propose electric vehicle with after the funding help to put in place the infrastructure needed.



### 3.2 New kind of trip

As mentioned in all the previous points, the possession of a car represents an essential budget for all the household. To respond to this challenge new solutions are used to reduce or abandon the property of a vehicle. In this point, the goal is to show the original actors of the mobility base on the utilisation of the automobile.

In a car-sharing point of view, two types of industry have known a recent significant growth: The service of a driver by demand and the car-sharing between private customers.

To present the service of a driver the most significant company is now Uber. The goal of the company is "Creating possibilities for riders, drivers, and cities". In the sentence created the group, all the business model of the company explains.

More than usual car-sharing the new term invented for this type of service is ride-hailing, the word defines the fact of order a driver for spontaneous needs with a regular taxi or with service as Uber thanks to an application.

The company Uber base on an application offer network where the customer can ask a driver for a ride. The service of driver exists since century thanks to the taxi, but the creators of Uber Travis Kalanick and Garrett Camp wanted to propose a more natural and cheaper experience to the customers.

The driver of Uber are not employees of the company but a professional register in the application to propose a service, in each ride made by the driver Uber take a commission.

For the driver, the benefit of this is the visibility and the flexibility to use a new way of earning money. The company present worldwide have created one billion connections.

The benefit for the customer:

- **Easy to book:** when a customer book an Uber on the application he chooses the destination, and he directly have a proposition of the nearest driver. When customers are in a foreign country, they don't have any more problem with communication to give the address.
- **Cost control:** when customers order a taxi they never have the idea of the final coast, for Uber they have an estimation precise of the travel coast and when the ride is finished they can check if the driver has taken the cheapest way.
- **Security:** thanks to the application customers can share the localisation with their family or friends. The localisation also integrates the first name driver and the car using.
- **Driver Profiles:** in the application, the customers can have access to the driver profile with a graduation base on the feedback from the previous customer. The information includes the number of trips realise by the driver, since how many he drives, language speaking and finally the grade on a scale of 5.
- **Multiple Destination:** if customers take a ride with their friends or colleagues they can take the same Uber to many destinations and the application automatically sharing the coast.

Now Uber respond at needed of mobility but also to the delivery of package and food.

Between 24 and 44% of the people in Europe consider car sharing a viable option for vehicle ownership, this new kind of revenues can come from a company like Uber or BlaBlaCar.

Uber is now also an actor of the carpooling with UberPool where a driver can accept 2 or 3 different customers in the same way to sharing the coast, but the leader of this in Europe is BlaBlaCar.

BlaBlaCar is a French company of carpooling privately. The goal of the application is to help the contact between two people who want to make the same ride to sharing the cost. The first mission of this service is to complete the offer of the public transport as the train, the bus or the plane. For most of the people, the carpooling represents a quicker provide and less expensive solution. The communication of BlaBlaCar is based on sharing an experience with other people, and the financial aspect is only shown as a compliment.

For the long-distance carpooling BlaBlaCar is the leader for average distances of 300 km for the 60 million members for 18 million travellers every quarter.

The rent car service represents the manufacturer a big market and a great way of communication. The actors of the market are limited and come as new actors are now tight.

The primary image of the rental car is the little shop in all airport where customers go to beginning their holidays. This type of consumption of the rental service stay acutely focus on this, but the market evolves quickly.

Now the rental car became a real alternative to the automobile possession. In effect for the big city have a car represent an important budget and a complicated thing to manage. For private use or for a company the advantages of renting a car is the flexibility, the agencies propose all type of products to respond at all needs in link with the customer needs.

The best example of diversification in the rental industry is the company Sixt.

The critical communication of Sixt is the opportunity for customers to experience the freedom of riding. The company went to change the relationship with the customer for the moment when they rent a car is more utility than pleasure. The goal of the Group in the future is to offer mobility safe, efficient and comfortable to transform all the experience into a unique feeling of freedom to gain the loyalty of the customer.

Thanks to this new policy the group know historical result despite a challenging market with 2.41 billion Euro revenues in 2016 for a progression of 10.7%. The group represent 215,800 vehicles in more than 100 countries with more than 6,000 employees.

Sixt offer:

- Sixt rents a car: The core business of the company with a core presence in all the most important airport. Now the company try to expend the offer to a pleasure renting for a weekend or a specific event.
- Sixt MyDriver: To complete the offer Sixt create in 2013 Sixt MyDriver to propose airport transfers and premium business offer. The business market is significant for Sixt because it represents the marge of evolution and the loyalty in this market is the key to the development. The base of the service is the quality of the offer, and now the service is only available in few countries but will be conquered worldwide quickly.
- Sixt Rides: As the model of Uber the group Sixt propose an alternative of the taxi more oriented to the transport to the airport with a premium vehicle and a personalised experience to satisfy the potential customer of the other offer by Sixt.
- Sixt Leasing: Finally, the group have a service of leasing at its portfolio. Sixt began the activities in 1967 with the goal to offer the mobility solution for everyone. Today the service in Germany is the leader in vendor-neutral, non-bank leasing providers. What the value of Sixt compare to the competitors is the global view on a fleet with many manufacturers possible, a robust IT solution to improve the control of the vehicle, a top-quality service network and strong customer loyalty.



FIGURE 7: SIXT Advertasing (2018.)

To conclude on this, point many company offer solution of mobility, and finally, the purchase of a car is not still an obligation. Thanks to this new consumption new opportunity can exist, and the roles of the manufacturer are to follow the latest trends or create a new solution of mobility with still the same goal, simplify the automobile experience.

### 3.3 Evolving of the society

To understand the evolution of the automobile industry the best way is to study the development and the influence of the society by a PESTEL.

#### 3.3.1 Political

Today the automobile industry has to manage much different challenge with new political regulation. Since the beginning of the century, the people understand the terrible impact of the car emission and more particularly in the city. For responding to the problem of air quality the occidental town has to organise a solution to replace the mobility from car to public transport. In addition to this in the example of the Europe commission the politic voting for regulation in the emission of the recent vehicle name Euro5 since 2009 and Euro6 since 2014.

However, all this measure knows an acceleration cause to distrust to the manufacturer after the Volkswagen diesel gate, that scandal choc the public opinion.

In 2015 a study lead by an American University revealed a critical gap between the emission data give by Volkswagen and the test in a real condition of using. After an investigation, the problem comes from an illegal software integrate into all the diesel car of the group to limit the emission during the usual protocol of testing. After the revelation of this scandal worldwide Volkswagen has modified all the vehicle but have lost the thrust of the customer and political.

After this, the critical city lead by Germany put in place restriction of aches in the city centre. The process changes between the city. For London or Stockholm, the solution was to integrate toll on the city centre to ask for a contribution between 13 and 24€ per day. For London and between 1.10 and 11€ per day for Stockholm, this can contribute only to allow the people to come with public transport and leave the car in parking outside the city centre. The second solution adopted by most of the city is to make a selection of the vehicle allow a base on the emission thanks to the European emission regulation, in the town as Frankfurt or german other towns the diesel is prohibited before the Euro4, and the recent news are more for a prohibition from the Euro6.

All of the political decision can appear worth and to selective, but the healthcare is engaging in these measures. For example, in Paris, 65% of the nitrogen oxide come from the road traffic.

To complete the measures of restriction must of the European state allow help to the citizen to buy a more sustainable vehicle. The decision to help the buying of zero-emission vehicle rally lunch the market of an electric car and permit to all the manufacturer to develop an electric range of the vehicle.

#### 3.3.2 Economic

The global economic climate affects a lot the automobile consumption, in effect the market represents a spend of pleasure for most of the household. The example of this influence was evident in 2008 after the Sub-prime crisis. In America, one group suffer a lot of the crisis General Motors.

The 2008 crisis was for GM the most challenging mission since the 100 years of existing near to be fatal for the group. Until 2008 the group was the worldwide leader with 9 million car product each year, and it's why the crisis takes significant proportion.

During the crisis, the primary target of GM the light trucks lose 35.5% of his volume, explain by the crisis but also by an essential increase of the oil price.

After four years of restructuring, the group find a new dynamic to go back on profit, but he groups loss in this period \$80 billion.

The Economic atmosphere of each country affect a lot the sales habits so to respond the manufacturer have to offer substantial offer with much flexibility. Also, to limit the loss of value the manufacturer work in just in time policy to restrict the stock hence the capital requirement.

### 3.3.3 Social

In a social point of view the automobile market represent the essential opportunity of work with high qualification. Forgive and example a group as General Motors employs 234,500 people.

However, the new vector of employment in the automobile industry is the research in link with the autonomous car, just in Arizona, the research employed 45,000 people. The technology is very, and a lot of high-quality employees are needs to revolution the market.

The point was in how the car industry influence in a social point of view, but the social aspect also affects the market and indeed the manufacturer choice.

Growing market is a key to development for most of the manufacturer within leading the Chinese market. It represents the first worldwide market now and still has a vital capacity for growth. The manufacturer to sell in China have to make a compromise, in the country is an obligation to have a partnership with a local company but if they want to be essential in the market the right way is to make an investment with factory and produce model reserve for the local market. The German brand adopted this policy of investment and now the Volkswagen group, BMW and Mercedes-Benz have some locals factories with a production of long wheelbase sedan focus for customer look in for a car and a driver.

Another point of the Social influence is the new way of consumption from the people. In fact, now the family travel more and need to bring more think in a car so thanks to this unique social aspect the retailers have developed a range of SUV for responding at the needs of freedom of the customers.

### 3.3.4 Technological

The technology impact on the automobile market has two very different influence.

The first one is in a right way, technology permit today at the manufacturer to create more sustainable car more comfortable to drive. The new technology development permit at the manufacturer to make a revolution in term of offer. Now a car is an incapacity to correct the little mistake of a driver and to offer at the passenger a very new experience with comfort and entertainment.

The technology also appears on the utilisation coast of a car, thanks to the new technology the new vehicle consumes less, and new solutions of propulsion are possible.

However, all the evolution in technology create needs for the consumer incapacity to change the requirements of possession.

According to the New-York Times, the question is: "For a teenager a car or a smartphone? / The iPhone is the new Prius?"

The question shows a real revolution on the global market. The median price of a smartphone has known a critical increasing and for most of the youth generation also called the millennials the budget goes first on a smartphone before the mobility solution. In a big city, this new trend has a

consequence a reduction of the percentage of peoples with a license so, in fact, a limitation of the potential customers.

### 3.3.5 Environmental

Learning for sustainability transition through bounded socio-technical experiments in personal mobility.

The customer has now worldwide a high care of the environmental impact. The communication about the ecological care for a decade was very high and mighty and finally most of the customers beginning to understand the effects of their consumption.

Thanks to the realisation customer now look forward more sustainable car not only during the using process but also in the production.

The brand with the combination of both are BMW I, and in particular, the model i3 with a production of the car in a factory feed by renewable energy and part of the car like the inside is created with the renewable matter. For the reduction of the impact during the using process the new solution is the utilisation of an electric vehicle in combination with a user of a solar panel or wind turbine.

To conclude the life of the electric car the recycling is the key. For keeping, a good impact on the environment the car will need a recycling cycle principally focuses on the battery, for the moment solution of Telsa, Toyota and BMW use the battery again to stock electricity as a power bank.

### 3.3.6 Legal

The main restriction from the legal influence is the development of the autonomous driving, the speed limit and the security problem.

For all states, automobile regulation represents a big challenge and a big debate. Worldwide the decision is different and not common rules are deciding, so some countries are very safe for driver and other not.

The section of a speed limit is deciding in link with the infrastructure of the country, but some nation goes further away from Germany with highway part without speed limits.

The legal decision of all country will be in the future decisions of the development of the autonomous car. The manufacturer will be work in pair with the state to put in place regulation. A partnership is already made between some countries in USA and manufacturer, but now the technology has to touch Asian and European market.

After the identification of the recent evolution and opportunity, it's easy to identify the problem of mobility and the challenge. The global society understands what is a need for the development, but the question is who have to invest?

Today all the car manufacturer but also other type of company is interest in the automotive revolution. This assessment shows the problem in the creation of a global solution, in effect, all the project is not in a link, and the selection of the best plan will be complicated.

To adopt a new solution significant as the mobility revolution the society needs the guarantee of feasibility and a market with clear regulation.

The modern society lives today a revolution similar to the introduction of the automotive industry at the beginning of the twenty centuries. The opening is a little bit anarchic, and the application is not a full success. However, since this introduction the automotive had not known real revolution, this creates today a kind of disorientation and interrogation. The phase of test can take a lot more time than we expected.

To respond a this problematic of cohesion some group begin to make an association to propose a universal solution with enough power to be applicable.

Th best example of this type of organisation is a joint-venture in the service part of BMW Group and Daimler (Mercedes-Benz).

The joint venture is based on few points of development:

- Create today sustainable urban mobility for the future by innovation.
- Create unique customers offering service of quality easy to use.
- Create an ecosystem for on-demand mobility to purpose car-sharing, parking place or charging place in the principal city of the world.
- Innovate for a sustainable and better quality of life in big cities by emission reduction.
- The joint-venture concept will ensure the expansion of digital business models at both companies.

With the example of BMW Group and Daimler, the customer sees a unique perspective of evolution, but the developers need to come also from a global view of the city of tomorrow.

## 4.1 New urban mobility

In all the previous point it was an image of the current market and the opportunity in the short term. The automobile market is very challenging for the manufacturer, so the company have to make a long-term plan. The construction of a model can take ten years of development. To respond at the market of tomorrow, the manufacturer doesn't only think about their evolution but also of the growth to all the city. A company today very focus on "The City of Tomorrow" is Ford.

The city environment is the most challenging for the manufacturer with difficulty of parking, congestion and painful driving but the market is huge, half of the population live in an urban environment. The City of Tomorrow have to manage the expansion, and this is only possible with a partnership with a manufacturer to propose more accessible and sustainable solution.

For Ford, the future of mobility is autonomous and electric vehicles using as a private possession, ride sharing or ride-hailing. However, now the problem of the autonomous car is the cohabitation with the average car and the basic infrastructure.

The response to this challenge for Ford is to create interaction between all the vehicles and infrastructures to create a secure and efficient environment. To manage this in the future the company as Ford have to make a partnership or pass convention with all the essential city to create the interaction. The significant benefit of all of this it's if the car possession reduces a lot the capacity of parking can be, and the congestion can be reduced if finally, all people not going to work on the same time and going with three other colleagues to the workplace.

More than an automobile revolution it's more a global evolution to go to cities healthier, easier to get around, safer and more productive. In the vision of Ford, the car is not the only solution but need to be helped by another transportation model as fast mass transport, drones in the city to replace the delivery truck and layout with a place for cyclist and pedestrian.

In most of the cities for a car user, the challenge is the last miles. In effect when peoples go to a centre, the challenge is to find a parking place near to the objective. To resolve the problem in the city of tomorrow, they can park or live the car before the goal and finish the way with complement way of transportation as E-bike, public transport or any other solution.

For the moment the project is acutely focused on the American market because the city is more able to welcome this type of project. All the infrastructure and road are more recent and ready to appreciate new technologies.

In Europe the integration can be more difficult all the capitals are full of history and the infrastructure can behave difficulties to integrate the old city.

In some countries in America or Asia where the city is more modern, the opportunity is more significant and can be enjoyed the town of tomorrow before the old town in Europe.

However, the partnership has also to be between the manufacturer, for example, the new partnership between BMW and Daimler.

The two German manufacturers would like to work together to create the urban mobility of tomorrow with a proposition of new solution.

The solutions are focused on 31 major international cities with a combination of sustainable and mobility solution.

Both groups have in its range electric or hybrid plug-in vehicles, so a typical application will be put in place to give the localisation and the access to 140,000 charging station and parking places reserved.

The base customer of this two group represents 13 million ride-hailing customers for a park of 20,000 vehicles available in car sharing.



The advantages of the joint-venture are a combination of the strength of each group and financial power to accelerate the deployment. The goal of the future will be to offer opportunities in all medium and large cities for the people in research of new mobility solutions.

To create a safe city, the future autonomous car will need to communicate with the existing infrastructure. The base of this is with the red-light, a human can predict and adapt the speed of a vehicle in approach to a red-light, but for an autonomous car, the information needs to be sent. To stay with a smooth driving style, the ultimate way of transportation without the driver will have to know in advance when the red-light will pass at the red to predict a stop or not. According to the Gartner prediction 250 million cars will be in the capacity to communicate each other and with the infrastructure for 2020.

All of this solution is for the moment focus on the future of the city but what is it possible for the other environment?

For future mobility in all environments, the car will need to be adopted at the city but also in the countryside.

In the car industry, the car needs to be adapted for all the environments, and the more demanding one from the customer is the highway.

Autonomous cars and highways are already near to be a reality. In the current market, the customers have the opportunity to ask for driving help in capacity to correct the human mistake. Companies like Tesla or the three premium German brands: BMW, Mercedes-Benz and Audi have a solution with another level of help. Now, these brands have an answer ready to keep a car in the line and to follow the traffic.

The example of this opportunity is by the BMW Group is a project named DriveNow.

The company offers to people with driving licenses an opportunity to borrow a car for short-term use in a city environment. The project is already a real company with implementation all around Europe including Finland with Helsinki.

The system is based on an application with a registration where the customer borrows a car for all-inclusive and returns the car any time and almost anywhere.

However, the question stays about the cohabitation between the autonomous car and the human driver. In the period of adoption, the autonomous vehicle will be only possible in the road adapted for and for a small city or small highway the driver will have to take back the control.

The human intervention will be needed still for few decades, and the extinction of the driving license is not for today, but some markets will be evolving a lot, and new opportunities will be created for convert and contribute to the city of tomorrow.

The compromise can be in an urban environment new solution of consumption. As seen in the technological influence the smartphone usage begins to replace the car purchasing. To respond to the market change Volvo, propose an all-new offer of subscription comparable to the smartphone model. The model for introducing that is the XC40, very oriented to an urban use the model creates a revolution for the brand with an all-new orientation. The millennials research a car unique and in link with the new habits. For this, the XC40 propose a subscription package where the customer can have a monthly rate with no surprises and the global maintenance include.

The young customer like to think simple, so Volvo add proposition of insurance and 24/7 concierge.



FIGURE 8: New Volvo XC40 (2018.)

Actors in the subscription market will be soon Porsche with an initiative of a retailer in Atlanta. The model lunch by the retailer is a little bit different than the Volvo proposition. Porsche proposes a vast range of the sportive vehicle to respond at all the utility. The customer has difficulty to choose the perfect car to react to all the needs. To combine these two facts the proposition is to pay a monthly payment of \$2,000 or \$3,000. Thanks to that the customer can use the vehicle they want when they want in link with the specific attends, the offer combines little sportive vehicle with the 718 and the big SUV of the brand the Cayenne in a version plug-in hybrid in a programme call Porsche Passport.

## 4.2 New technologies:

In all the previous point the feel-back is an obligation for the car industry to evolve. The evolution is based on the customer experience and the driving assistance. All manufacturer and equipment manufacturer work on the new technology, but the concretisation can be only possible with the development of the Artificial Intelligent and a better worldwide internet network with the 5G.

The Artificial Intelligent have a benefit of the learning capacity, in effect without A.I a software have a fixed potential, and only manual update can improve it. On the contrary the A.I learn from the experience and strengthen their capacity to discern and recognise the environment.

In automobile industry A.I have two potentials.

First the human to machine interaction, already using, A.I in the car industry work as a personal assistant. The group Daimler shows the example of his capacity since the revelation of the all-new Mercedes-Benz A-class with Mercedes Me. Comparable at Google assistant it is in capabilities to interact with the driver with a smooth sentence and with a significant role of improvement to answer customers about destination, place to go or driving a decision.

The type of utilisation uses work today as an example to help the adoption from the customer, but the next step will be more difficult to adopt for the government of each country and from the society in general.

Secondly the driving assistance capacity, in experimentation today the autonomous driving opportunity is only possible if the A.I acquire a perfect knowledge of all the driving situation. To be close of that the vehicle from a company like Uber, Google or all automobile manufacturer has to go on the traffic for many millions of mileages to experiment the reality and learn the potential reaction of a human.

For the manufacturer the A.I will become a standard in the next five years for the first time as a potent help for the driver to grow in the future the only source of the decision.

The next step will be to create a network of a car with a combination of learning. In effect, the A.I performance is for the moment stock on the vehicle and the learning experience is different for all the car. To create a safer solution the A.I knowledge will be available directly on a cloud platform where the car will be able to send and acquire the knowledge of the other vehicle.

Communication between the vehicle is already possible thanks to the experimentation of the Valeo technology.

To exchange information and data analyse the future conned car will need more interaction to be more efficient and safer. For this upgrade, a unique solution has to be created where the manufacturer could find an opportunity to communicate with all the market.

The kind of solution to respond to the needs of communication can only be an offered by the manufacturer supplier and the one incapacity to make that is Valeo.





















The first step for Valeo will be to create a solution to overtaking more safely with interaction with the car at the front to know if someone come in the other way but the next step will be to create communication between all the vehicle to predict congestion or all other loss of time.

The solution is already created but needs the support of new technology base on an all-new communication network. In the previous example, Valeo has work with Japan's leading mobile operator NTT Docomo to use 5G. It is the next step of the mobile internet network, for the moment the 4G is very oriented to the basic usage of the internet with video, information and social media but are not ready to welcome the critical amount of information exchange.

The new network of 5G is planning to be developed in 2020 and be more focus on the interaction between the objects including a car with a high speed of transmission and with a reduced the frame.

However, this will be only possible if the company of the two sectors work together and use the respective expertise to propose a universal solution.

TABLE 1. Contributors of the 5G Automotive Vision in the European Commission (2018.)

Category	Logo	Organisation
Automobile Manufacturer		Volkswagen AG
		Volvo Car Corporation
		PSA Peugeot Citroën
Automotive Supplier		Robert Bosch GmbH
Telecom Operator		Orange SA
		Vodafone Group R&D
		DoCoMo Communications Laboratories Europe GmbH
Telecom Vendor		Samsung Electronics R&D Institute UK
		Qualcomm
		Nokia Networks
		Alcatel-Lucent Deutschland AG
		Ericsson AB
		Huawei Technologies, European Research Center (ERC)
Research Institute		Centre Tecnològic de Telecomunicacions de Catalunya (CTTC)
		King's College London
		National and Kapodistrian University of Athens
		Eurescom
		Technische Universität Dresden
Other		ERTICO – ITS Europe
		InterDigital Europe, Ltd.

In the previous table is the perfect demonstration of the diversity of company with interest in this new technology. The 5G represent the next big challenge but also a significant opportunity for development in term of business and influence for the telecom company.

To finish this point with a crazy idea a project from Elon Musk the creator of Tesla is to create a new network under the big city with his Boring company to propose at the owner of Tesla or also usual passenger opportunity to cross a town at 200 km/h. The base of this project is a network comparable to an underground but build by a private company for public transport use. The primary mission of the project is to reduce the time travel, the congestion, the coast and the environmental impact.

The initial important project test is for the East Coast of America in the city of New-York, the project can be possible in the USA because the current public transportation is very poor.

### 4.3 Security problem

The first challenge of new technology is the security problem. On a great adoption from the customer, the technology in charge of the mobility need to be sufficiently reliable. A customer doesn't care if the all-new screen has some latencies sometime but if the passage of an autonomous car can't trust at 100% the technology the market can't be mass using.

For the moment the situation is very complicated after some fatal crash by vehicle from Uber and Tesla.

In Arizona, a woman involved in the first fatal crash caused by a self-driving automobile operate by Uber.

The circumstances of the crash are particular; it happens by night in the middle of a city where a pedestrian with his bike across all the line. The car doesn't react after seen the woman, so who makes the fault?

The manufacturer of all the detection hardware communicate the fact of there has seen the pedestrian, so the problem comes from the decision of the software created by Uber. The question here is not if a human will be in capacity so react but why the car doesn't have taken the right decision?

However, Uber was not the first company involving a crash for his driving assistant; it was also the case for Tesla.

Tesla was the first manufacturer with an offer to propose real advance driving assistant incapacity to take the total control of the car without any assistant from a human, but the regulation and the low maturity of the technology obligate the driver to stay focus. What the problem created by the technology was an excess of thrust from few drivers provoking a fatal crash.

At the beginning of the commercialisation Tesla has communicated a lot in an event where the autopilot saves the life of the driver but thanks to this the American customer has acquired a too essential thrust in the capacity and leave the car without attention.

The result of this excessive thrust is two fatal central crash.

First, one in June 2016 where a Model S control by the Autopilot in the USA involved in a crash, the communication sent by Tesla was oriented on the reliability of the system with before the crash 130 million miles in Autopilot control without grave mistake. The second aspect of communication was the difficulty created by the environment in the impact. It was on a highway crossed by another road where the car doesn't have detected a truck was coming in the other way.

The second one was in March 2018 involving a Model X with again the Autopilot mode activate. The crash happens in California where the car crashed into a roadside barrier and caught fire. The Model X asked the driver to take back the control several times.

One time again Tesla communicate about the Autopilot as a driving help but not an autonomous system.

The cases of Tesla are not comparable to Uber because the system of Tesla keeps a need to have attention from the drivers with a request to stay the hands of the driver on the steering wheel.

All the previous fatality crash was created by software problems to gain the trust of the potential customer the automobile industry will need to improve the reliability of the driving assistant. The decision of the car need to be perfect, and the solution needs to be entirely without control from the customer. The final goal is to transform the driver as a passenger.

However, the decision needs to be controlled by the manufacturer, but most of choice ask some Ethics problems.

Two ways can decide the Ethics decision for the autonomous car. First, the manufacturer can take the decision individually, or the state can make some regulations to create harmony in fact.

The autonomous car doesn't have the very human thing like the judgement, where a human can decide with appreciation and adaptation. The autonomous vehicle only makes for what it was made. The problem will be the adaptation to the traffic because if the car takes too much care of the security, the experience can be lost in fluidity.

The most Ethic problem for the future autonomous car will be the decision process. In a situation of risk, the car will have to decide to keep the security of the passenger or the pedestrian. The future can be to organise the global regulation of the autonomous car decision.

The software hack of the car can be a potential risk for the new autonomous vehicle.

Security of the new network will be the next challenge because the car capacity is only possible in link with the software. Like all the latest technology the sensibility is the potential hack.

Hackers have already taken control of a conned car.

In San Francisco, a car was controlled from few miles of the vehicle with only the help of a computer. The vehicle was a Jeep Cherokee with a lot of driving help, but without proper safety, so the hackers have found a breach in the system and have taken the entire control of it. In the video, they demonstrate the capacity to turn on the car and drive it. The two men were security expert, and the video was made to alarm the group Fiat-Chrysler but in the future, all people will not communicate the breach and can maybe use it.

The new high-tech cars have a lot of little technological thinks, and the security problems come from this. The solution for the manufacturer will be to create one important central management of all the high-tech secure by a society specialise on this.

The security can come from the network using:

The protection is necessary to prohibit access to a car to control it but also to not keep the personal information of the users. To offer opportunities for security, the future vehicle will need to have some multiple sources of data with a part directly integrate into the software of the car and a more global part host by the manufacturer.

The central management is only possible if the manufacturer respects necessary things of security:

- Protected connection, to access the information from the car or distance a secure system identification can be put in place and only accessible from the user.
- Privacy protection, as seen in the beginning the privacy are a crucial point of work. To guarantee the total security, the only solution is to offer like Apple a product where the confidentiality stays stock and doesn't go to the cloud.
- A possibility of evolution, the security software to be efficient in a long-term point of view need to have a chance of development, the example of this is Tesla with car incapacity to make software upgrade during the night without human intervention.
- Cryption of all the data, the data created by the car need to be used only by the vehicle and the manufacturer if the customer gives the right. To guarantee that the manufacturer has to put in place solution of encryption understand the right people.

The market has to follow the evolution of which manufacturer to guarantee security at the customers.

Needs of connections for the future autonomous car will become a real problem, in effect for using the cloud the excellent internet connection is needed.

In a meteorological point of view, the autonomous automobile was for the moment testing in the best condition possible. The American cities where the car running is the perfect condition for the captor without a lot of raining or snow.

In countries like Canada or the Scandinavia country, the adoption of the autonomous car will be very complicated and only possible in the summer.



## 5 CONCLUSION:

For the future, all depend on the support from the customer to the new project of mobility. Many revolutions in term of technology know a limited success due to a project launch too early with a customer not ready and a product not reliable. The politic of all the manufacturer is to launch the new kind of mobility soon as possible, but it will be better to wait maybe a market ready to welcome it.

The driver needs a pure experience, and the autonomous driving is only possible if the driver can't have to stay attentive to what the car has done. In my point of view, the market doesn't have enough maturity, and the test will have to continue longer and with the testing place more diversify.

In the thesis, I'm was concentrate in the market simple for me to understand, so it is the market I know like Europe or the market with much information about like North-America and Asia. This choice gives a point of view more focus on the current central market, but the growing other demand will represent the future evolution for all manufacturer.

The conclusion I made is a future with a solution adapted to all market. The major city worldwide will have an answer of mobility offered by the new actors in the market. For all the other city manufacturer will have autonomous car solution in service or with a monthly payment. Finally, for the countryside and the growing demand, the answer will be vehicle very similar to the car of today with more driving help to offer more security. All the market will know a revolution and where today the retailer provides the opportunity to buy a car tomorrow the solution will be more oriented to an offer of mobility service.

To conclude more in a personal point of view an objective more personal than scholar motivated my work. The Thesis represent an opportunity to research a subject useful for my future. Actually, in a Bachelor program, my goal is to integrate next year a master's degree and for this, I need to apply to new school. To transform an obligation as an opportunity, I choose to study a subject in link with my specialisation targeting. Thanks to the Thesis I'm now in capacities to have a more long-term vision on the automobile industry, and I'm sure this can be an essential value for the recruiter.

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