

MARKETING AND PRODUCT DEVELOPMENT IN THE AUTOMOTIVE INDUSTRY GLOBALLY

МАРКЕТИНГ И ПРОДУКТОВО РАЗВИТИЕ В АВТОМОБИЛНАТА ИНДУСТРИЯ ПО СВЕТА

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Abstract: Many social, economical and technological trends begin to work together in order to transform the mobility and to create new urban models for the next decades. The trends coming from the technology development will revolutionize the way the automotive industry responds to the changing consumer behavior. Building new partnerships will lead to transformational change. The connectivity and the automation will fundamentally change the automotive industry. The expected operational ecosystems include e-hailing mobile applications for shared electric vehicle, infotainment services and personalization inside the autonomous vehicles, connectivity to the infrastructure and provision of various services due to the Internet of Things, which will grant safe, sustainable and reliable transit.

Keywords: MARKETING, PRODUCT DEVELOPMENT, AUTOMOTIVE INDUSTRY, MARKETING INNOVATIONS, MARKETING STRATEGY

Introduction

At the present moment the human mankind is challenged to develop the global transformation of the human-machine connection. The focus goes mainly to the safety and social changes. The automatization naturally will change the labour market and will increase the unemployment. From other hand, it will help reducing those 94% of the accidents caused by human factor (KPMG, 2013), and will provide opportunity for the disabled or older people to move freely. It will also provide opportunities to the families with low incomes for savings, instead of buying and servicing cars, which they anyway use rarely. Depending on the location, landscape, climate conditions, the cities will be developed in more advanced way with the respect of the choices which people make as an investment in this technology.

It is a personal choice for this technology. People will be able to choose not to drive if they will, or to have the safest option for travelling, if they prefer driving. The autonomous vehicles and the smart transport systems will be able to provide information how people use the infrastructure. Still there is a nostalgia for the travelling – people love to jump in their cars and to travel faster and longer when they want. (Parment A., 2014). However, the present tend to be different. The roads are crowded and congested, the travelling time is becoming longer. People try to options to cut time and distance when they travel, and stress and fatigue respectfully. Now the current generation travel longer as time compared to the previous generations. (Warren T., 2016). The development of the technology and Internet of things (IoT) changed significantly the consumer behavior and the product development in many industries, incl automotive. The consumers live in a connected world and expect their important devices to perform in the web and in a network. The IoT is developing rapidly and the vehicles will be part of this connected ecosystem, thus creating ongoing relationships between companies and consumers. (Mohammed J., 2015; Stevenson J., 2017)

The trends

The automotive industry is in a process of the technical revolution. Shared vehicles, electrical vehicles, autonomous vehicles, telematics, personalization, augmented reality, driver assists, infotainment. The automotive companies should develop a strategy before starting to transform. **Four main directions for strategies in the digital world** are offered (Stevenson J., 2017):

- Talking to broader digital landscape – the technology and the digital wave impact all industries and the automotive companies should follow best digital practices in all industries, learning and adapting.
- Recognizing customer expectations – this means strategy for the entire consumer journey and experience; as becoming more

connected, the consumers require more personalization, services and opportunities for purchase via smart device/web.

- Laying groundwork for future agility – the companies not only should predict the future, but to predict how it will happen in practice; this is the way companies to become innovators.
- Expecting digital disruption – at all levels of the value added chain; using the generated data to facilitate the decision making; having a flexible plan to expect changes.

The trends are naming the new cars as “connected and smart”. There are several critical dimensions, which the automotive industry should consider and to be able to manage – **macroeconomic forces, new personal mobility and stricted regulations.** (Hirsh E. Et al. 2016, PwC)

The long life cycles and the serious investments make the planning in the automotive industry a complex factor. Over the last decade all automotive companies were after the sales volumes, in order to improve the profits during and after the crisis, aiming at larger economies of scale if and where possible. It will be very challenging for the companies to satisfy all specific local requirements. Among them are the quotas, taxes, preferences for types of engines, climate, design, cultural factors etc. This requires solid presence with factories, or near by factories, and strong dealer network.

The connected and the smart vehicles are only the beginning in the future development of the automotive industry. Their impact is very strong on the way the companies reorganize their businesses. These vehicles shape a future which was unbelievable a decade ago. At the present moment, two separate industries consolidate in order to create and develop these new vehicles – the automotive and the technology. The industries bring in different cultures, different product development models and business operations. The participation of high-tech companies brings the necessary knowledge to develop technology which includes the critical components for the connected, autonomous and communicational capabilities of the vehicles. From other hand the automotive business is something which is done best by the automotive companies. This synergy has the potential to create the future cars.

Despite of the fact that the autonomous and electric vehicles are the future, it is expected that their sales will be difficult. (Hirsh E. Et al. 2016, PwC). The conventional engines will be dominating in the next couple of decades until the volumes of the traditional and the smart vehicles on the road become even (Litman T., Victoria Transport Policy Institute, 2017). In this situation the newer vehicles will differ mainly by their innovative technology and features such as driver assists and global web connectivity.

Despite of the fact that the automotive industry should focus on new mobility features in the vehicles, the stricter regulations on the

CO2 emissions are on their way and the automotive companies are dependent on this too. To meet the new standards, significant changes in the engines are necessary in the short term. Having in mind the life cycles of the models, it would mean that still today we should see maximizing the fuel efficiency and minimizing the CO2 emissions, as well as further use of the alternative resources and renewable energy.

The tendencies which rise by the technologies will revolutionize the way industry responds to the changing consumer behavior, new partnerships will be created and will bring transformational change. (Gao P et al. 2016)

Today the economies are changing rapidly, prompted by the emerging markets, the accelerated rise of the new technologies, sustainability policies and the changing consumer preferences for the ownership. The digitalization, the rise of the autonomy and the new business models have revolutionized the other industries and their impact is imminent for the automotive industry. These forces lead to four technology-driven trends in the automotive industry (Gao P et al., 2016), defined as disruptive: **diverse mobility, autonomous driving, electrification and connectivity**. These four trends will enforce and cherish each other, and the automotive industry should be prepared for the new disruptive technology and should reshape its value proposition. Based on these trends, the authors present **eight perspectives** on the automotive industry in 2030:

- The profits in the automotive sector will increase and will diversify based on the mobile-on-demand-based services and the data-based services. The connectivity and the autonomy will allow the vehicles to transform into a platform for the driver and the occupants, and to use their travel time to consume new media formats and services or to enjoy other forms of entertainment in their free time. The raising speed of the innovations, especially in the software industry, will introduce upgrade opportunities in the vehicles, similar to smart devices.
- Despite the shift towards shared mobility, the new cars sales will continue to grow but with lower rate, at around 2% per year. This drop will be led by macroeconomical factors, as well as the new mobility services, car sharing and e-hailing.
- The consumer behavior for the mobility is changing which will result in 1 out of 10 cars sold in 2030 to be a shared vehicle, and the rise of the fit-for-purpose mobility solutions. The consumer preferences, stricter regulations and the technology disruption, bring fundamental change in the individual mobility behavior. Multiple modes of transportation to complete their journeys are used by the modern consumers. Nowadays the consumers don't go after goods and services - these are delivered to them. Dense urban environments proactively discourage private-car use. The traditional new cars sales model is expected to be complemented by diverse on demand mobility solutions. The consumers will choose the best solutions according to their need. It is expected over 30% of the mileage of new sold cars to be from shared mobility by 2030, and 1 out of 3 cars to be used for shared rides in 2050.

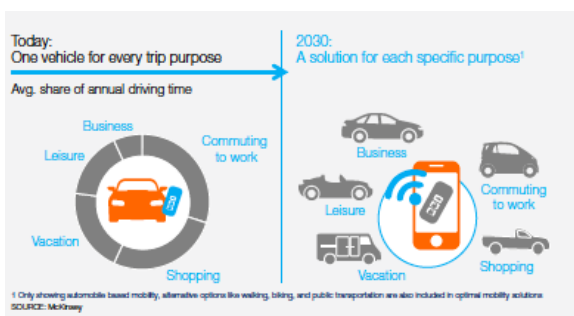


Fig1: New vehicles market in 2030., Source McKinsey&Company

- The city type will replace the countryside or regions, as most relevant dimension for segmentation. This will define the mobility behavior, as well as the speed and range of the automotive revolution. The new solutions market potential will be based on the segmentation of the cities according to their density, economic development and opportunities. Consumers' preferences, the regulations and the policies, and the cost of the new business models will differ based on these criteria.
- Once technological and regulatory issues have been resolved, up to 15 percent of new cars sold in 2030 could be fully autonomous. The fully autonomous vehicles will hit the market not earlier than 2021-2022. Until then the main role for preparing the regulators, companies and customers will have the advanced driver assists, which could take over for a while and under certain conditions.
- The electric vehicles are becoming more competitive and they are gaining speed, however their adoption will vary at local level. Stricter regulations on the CO2 emissions, lower costs for batteries, developed and available charging infrastructure and the increasing adoption by the consumers will create conditions for serious penetration of all types of electric vehicles. Various forecasts predict different share of new electric car sales by 2030, which vary between under 10% up to 50%. Most of the sales are expected in the cities with very dense population, having strict CO2 emissions regulations and offering strong incentives in the purchase of such vehicles – subsidy by the state, low or no taxes, reduced price of the electricity. The opposite is expected in the countryside, with less developed charging infrastructure, longer travel distances and dependency of the range. By constant improvements of the technology and the batteries' prices, the differences will be overcome and the electric vehicles of any type will gain bigger share, on the expense of the conventional vehicles.
- Within a more complex and diversified mobility and industry landscape, the companies will be forced to compete simultaneously on multiple fronts and cooperate with competitors. The paradigm shift in mobility as a service, and the newcomers on the market, will force the traditional automotive players to compete with everything which provides solid user experience in travel as well as alternative ways to spend their money instead. The mobility services suppliers (Uber), high-tech giants (Apple, Google), and especially the manufacturers (Tesla) seriously change the competitive landscape. The traditional automotive manufacturers which are put under constant pressure to reduce cost, improve fuel efficiency, reduce CO2 emissions and keeping financial stability, will be in the middle of diverse situations in the evolving automotive and technological environment, which will lead to consolidations and various forms of partnerships and alliances. The software competences are becoming one of the key factors for differentiation in the industry. The software is critical for the assists, the safety, the infotainment, connectivity and IoT. The cars are integrating in the world of connectivity and the manufacturers have no other choice but to be part of the new transport ecosystems, which appear as a result of trends in the changing consumer behavior and technological development.
- New market entrants are going to target initially not only specific economically attractive segments and activities along the value chain before exploring further fields. Besides the most popular players, many new entrants outside the industry are also expected, bringing new influences and trends – start-ups and tech companies with capital. The big Chinese automotive manufacturers could also play serious role in changing the landscape and new technologies' penetration at global level.

The autonomous technology

The potential benefits, which the advocates of the autonomous technology predict, are significant convenience, safety, congestion reduction, fuel economy, pollution reduction. Human mistake lays in 93% of the accidents on the road, and the autonomous vehicles will reduce these accidents by 90% (KPMG 2012; Fagnant u Kockelman 2015), inc. system mistakes, ("death by computer"), cyberterrorism (Bilger 2013), will offset the risk by the people behavior on the road (especially when they feel safer) and the side effects such as increased traffic by faster or cheaper mode of transportation. (Ecenbarger W., 2009; Fung B., 2015; Kockelman, et al. 2016; Lin 2013; Ohnsman 2014). If people are feeling safer, the occupants could use the seatbelts less, the others on the road could become less careful, the vehicles could operate faster and closer one to another, and human-drivers will be part of the autonomous vehicles groups on the road, which will provide new risks and requirements. Millard-Ball (2016) supposes that the pedestrians will be less careful and less responsible because of the autonomous vehicles. Detailed analysis by Sivak and Schoettle (2015) concludes that the autonomous vehicles could be less safe compared to an average driver, and they even could increase the number of crashes when there are both autonomous vehicles and human-driven vehicles on the road. The estimated cost reductions for congestions and parking, energy economy and CO2 emissions reductions, are still not clear mainly because of their contradictory nature and effects. The opportunity for working and leisure in the cars will make some users to choose bigger cars, which to serve as offices and bedrooms, and to travel longer distances on yearly basis. The autonomous taxis and self-parking cars will possibly have more empty travels. Despite of the benefits coming from the increased travels and mileage, the autonomous vehicles could increase the external influences such as cost for and by congestion, parking, liability and third-parties risk, carbon emissions and energy. Some stargeies such as platooning could be limited to some highways and roads only, and the vehicles with human-driver could increase the congestions on the regular roads. The autonomous vehicles could reduce the public transport use, but new ways to travel could appear, which require bigger range and total mileage. The autonomous vehicles could be programed to optimize the comfort of the occupants. Le Vine, Zolfaghari and Polak (2015) made a research on the matter, as the occupants are more sensitive on acceleration than the drivers, and since they are going to use their time in the car as they will, it is possible for the sake of comfort they to program the vehicle to accelerate and brake more smoothly, in comparison to the conventional cars. However, this could result in reduction of the road capacity.

The increased cost for the production of autonomous vehicles are still not clear too. Sensor, computers, processors, controls and software are required. Their cost are in thousand USD, but naturally their prices will drop when they enter into mass production. (Silberg G., KPMG 2012).

It is stated that the autonomous technology and possibilities will result in more shared vehicles – sharing personally-owned vehicles and shared taxis. (Fagnant and Kockelman 2013; Schonberger and Gutmann 2013). Sivak and Schoettle (2015) estimate that if one household's vehicles serve to many users, it would reduce the ownership with 43% and to increase the total mileage with up to 75%. Despite all, it is difficult to predict the exact effects. There are many reasons people to prefer owning a vehicle. Status, convenience, luggage, mileage, and a personal driver. Yes, the autonomous vehicles could reduce the cost for the personally owned vehicles. However, the effects could also be insignificant. Especially for the taxis the maintenance and keeping them clean, the personal comfort and peace, will be important. An important matter is vandalism and the costs occurring with it.

Vehicle-to-vehicle (V2V) communications and connectivity to the infrastructure (Ninah et al. 2015) could be on the market in couple of years, making the autonomous vehicles smarter and safer. These new rule for connectivite between the vehicles will additional

provide new trends in the autonomy, as well as they will energize the automotive and the tech industries for new customer-oriented solutions and personalizations. This will impact not only the cars, but also buses, trucks, trams, all public transport. It is expected the autonomous technology to reduce operational cost with up to (Naughton K, Bergen M., 2017)

Despite of the big progress in the automotive industry, significant improvements are required to reach Level 4 and 5 of autonomy. (Simonite 2016). In the present moment most of the new cars are Level 1, Tesla's models could be considered Level 2 due to certain features. Couple more years are needed for testing and development before the authorities and the potential consumers to be sure that Level 4 or 5 to operate in all conditions. (Bilger B., 2013; Schoettle and Sivak 2015).

An analysis on the future fleet on the road predicts, that to have predominant fleet of autonomous vehicles in 2035, most of the new car sales after 2025 have to be autonomous, as well as the new cars sales levels to triple, so a renewal of the fleet to happen in just a decade instead of three decades. This will require most of the drivers with low and middle income who choose used cars or cheap new model, to spend a lot more money to buy new vehicle with autonomous features. In addition, a lot of other conventional vehicle have to be scrapped because of the lack of such features. (Litmann T., Victoria Transport Policy Institute, 2017).

The autonomous vehicles could raise the prices of the cars with thousands, and will require additional investment by the users for subscription fees for special navigation, maps, online services etc. Despite that the autonomous technology will offer great benefits for some users, it is not clear what part of the drivers will accept the value of these benefits in additional costs. There is ageneral support of the concept, but there are also significant preoccupations about privacy, personal data and safety, as well as very low readiness to pay additional amount for the autonomous features in the vehicles. (Schoettle and Sivak 2014). In the beginning, the autonomous vehicles will present small part in the total sales, with a market share which is growing in the following decades, when their performance is improved, prices fall and the benefits are more visible for the mass consumer. Within time, naturally the autonomous vehicles will increase their market share in the overall fleet, until becoming mainstream their mass penetration after 2050. (Litmann T., Victoria Transport Policy Institute, 2017).

Product offerings

The autonomous vehicles begin to make a move from the labs to the showrooms. **Tesla, BMW, Daimler, Ford and Volvo** announced that they will have fully autonomous models on the road by 2021-2022. Google's **Alphabet** presented its project called **Waymo**, and along with **Chrysler** launched the autonomous Pacifica minivan, which to hit the road in 2017. Besides, the company is in negotiations with Honda in order to integrate the technology in their models too. (Naughton K, Bergen M., 2017)

Google's autonomous project gathered huge attention, as during the last seven years, more than 2 million kilometres were logged in testing. Similar to Android OS, **Waymo** could also develop a software for autonomous vehicles, to license it for the automotive manufacturers and to earn from the services and data. After quitting its **Titan Project** and car development, **Apple** is also taking similar approach.

At the present day (spring 2017), people can have a glimpse on the autonomous driving on the backseat on a **Uber** taxi (Volvo or Ford) in couple of US states, or eventually to have a look at Chevrolet Bolt's test rides. GM is also testing the vehicle in carsharing Lyft's fleet. The main point is that the customer should get used to the technology and potentially buy such vehicle one day. The company is working on more autonomous system called Super Cruise via Cruise start-up, which will allow literally hands-free driving on the highway. The decision for initial integration of

technology in the shared vehicles does make sense, as the LIDAR sensors for monitor the environment are still expensive, and economy of scale is required. Still, the experts in the automotive industry don't expect to be profitable selling this or next generation of the technology. **Ford** is also in the middle of testing and should launch its autonomous vehicles up to five years. (www.autonews.com)

Tesla is the main disrupter and accelerates the autonomy since it is equipping all its models with systems which allows a robot to take on the wheel. It is expected the technology to be available for the end users very soon, which puts serious pressure on the rest of the big players. Instead of working step by step, the company launches the technology and the rest should catch up. **VW Group** presented in April 2017 its concept models form main brands in the group, which integrate driverless features. **Mercedes** is working on its systems, sensors and maps for couple of years, and announced that by 2020 will launch autonomous taxis on the road. **BMW** is also a key player.

Regarding the electric vehicles, the manufacturers are also under serious pressure to electrify their offerings, in order to meet the more and more stricter regulations on CO₂, especially in Europe and China. The main issues is the availability of battery cells in the next decade, in order to respond to the great demand by the companies. The most active companies are **VW Group, Daimler, BMW, General Motors** and **Ford Motor**. **VW Group** is leading for now. The company expects to sell between 2 and 3 million fully electrical vehicles per year up to 2025 r. (Gibbs N., 2017). **Tesla** has a plan to sell 1 million such vehicles per year globally. Only in Europe, **Nissan** forecasts 20% of its sales to be electric vehicles. **Ford** expects 15% to 20% of the Chinese market to consist of electric vehicles. If as destination point is considered 2025, **Mercedes** forecasts that 15 to 25% of company's sales globally will be of cars with batteries. **BMW** has the same forecasts, but it includes also the plug-in hybrid models in this number. **Ford** intends 25% of its global sales to be full or partial electric vehicles. (autonews.com)

In 2016 **GM, Renault** and their main battery partner **LG Chem**, removed one of the main obstacles for the successful sales of electric vehicles – the range. GM announced that Chevrolet Bolt/Opel Ampera could go for 500 km with a single charge, and Renault announced the second generation Zoe to have a range of over 400 km. The next big leap regarding the range is expected around 2019. (Gibbs N., 2017)

Conclusion

The introduction of the autonomous vehicles could be slower and more complicated compared to most of the forecasts. Technical challenges could be more complicated to solve too, so the autonomous vehicles to be available on the road not before 2030-2040 (Litman T., Victoria Transport Policy Institute, 2017). They could have higher production cost and prices, and their benefits to be less than forecasted, and the negative effects – more. The technical issues, the issues with privacy, data protection and personal preferences could decrease the consumer adoption, and the fleets to continue to consist mainly human drivers, despite of the changing consumer behavior on the mobility and the positive expectations. The faster adoption will require faster production, integration and renewal of the overall fleet, in comparison with previous innovations and their mass production. It is a field which requires continuous research and analysis.

Despite of the above, the industry is at the threshold of launching. It is not a matter of proving it, but a matter of selling the technology to the manufacturers, taxi companies, ride and share companies and end-users. The success in 2030 will require the automotive companies to be in constant expectations of new market trends, to research alternatives to the traditional business models, and to develop new business models and successful strategies serving their businesses and especially the consumers in the digital world. The industry is transforming from competition between direct competitors

into new competitive relationships, but also in partnerships and opened ecosystems. To succeed, the automotive manufacturers and providers should form new alliances or to be part of the new ecosystems. With the increasing role of the software in forming the innovations and value of the product, the companies should act in a way that their competencies and processes respond to the new challenges and the consumer definition of innovations, software based value, cybersecurity, personal data protection and constant product updates. The automotive manufacturers should additionally differentiate their products and services, and to offer new ways of providing value and full customer experience with the products.

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