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NEW MOBILITY BEHAVIOURS AND THEIR IMPACT ON CREATION OF NEW BUSINESS MODELS

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ABSTRACT

Megatrends developing in the global economy are mainly connected with social determinants influencing customer demand. A new generation, Y generation, declares other priorities than previous ones, what will result in the emergence of new mobility behaviour patterns. This in turn will be a drive for creation of new business models in particular sectors, for example in the automotive industry. The article presents these changes as well as autonomous vehicles and Mobility as a Service (MaaS) as concepts connected with future people mobility and new business models.

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INTRODUCTION

Changes in the global business ecosystem are mainly related to changes in demand, and these in turn are connected with megatrends. Social phenomena that may be observed for several years, and - in some cases - for decades, will continuously increase, although their intensity may be diversified. The Y generation, very different ideologically from the previous ones (Noble, Haytko & Phillips, 2009, p. 618; Parment, 2013, p. 191), entering adulthood is disrupting current systems of market forces and will result in transformation of existing business models into completely new ones, which will revolutionize a structure of supply chains.

The paper especially focuses on presentation and analysis of changes in mobility of people and goods related to current trends (Industry 4.0, the Internet of Things, Car

Connectivity, Sharing Economy and others) and their importance to development of new business models. The main aim of the study is to present influence of new mobility patterns (especially in large cities) on creation of two new models: Mobility Service Provider and Basic Mobility Provider, and a new kind of service: Mobility as a Service (MaaS). Also, it is important to place development of autonomous vehicles (AV's) among these categories. To achieve the goal of the paper, the authors used descriptive research methods – the main one is the method of critical analysis of secondary sources, namely research papers and business analysts studies.

The first part of the article contains a description of megatrends affecting changes in existing business models and creating new models in the global economy. The second part refers to the changes in these models on the example of the automotive industry, which is considered to be an indicator of changes in the global economic situation. Another part contains description of the main changes related to megatrends and new business models. The last part summarizes the article and provides guidelines for further research.

The research material gathered in the paper can be a starting point for empirical research related to particular megatrends in the global economy, mobility behaviour patterns and their impact on emergence of new business models. The article contains a number of hypotheses, which should be examined and verified.

MEGATRENDS

According to some researchers, today the economy is entering the final phase of the Kondratieff cycle, which will include innovation focused on convergence in many areas of economic activity (Roxana & Vasile, 2012; Hoppe, 2013; Ryszawska, 2013; Gauthier & Genet, 2014). Changes in the global economy will result in emerging of new business models.

Megatrends are global phenomena that develop in the economy for 30-50 years and affect development of strategies of global corporations. They relate primarily to social issues that significantly determine changes in a structure and size of demand (see Table 1), and technological changes associated with digital transformation (see Figure 1).

Today much is said about the era of Industry 4.0 (Hachmann, Keßler & De La Torre, 2016, p. 2-3; Sanders, Elangeswaran & Wulfsberg, 2016, p. 812), which is characterized by: (Roland Berger, 2015, p. 28):

- fast response to customer's requirements,
- high production flexibility,
- ability to produce smaller production batches,
- high process efficiency and stable processes,
- improved products,
- efficient use of resources.

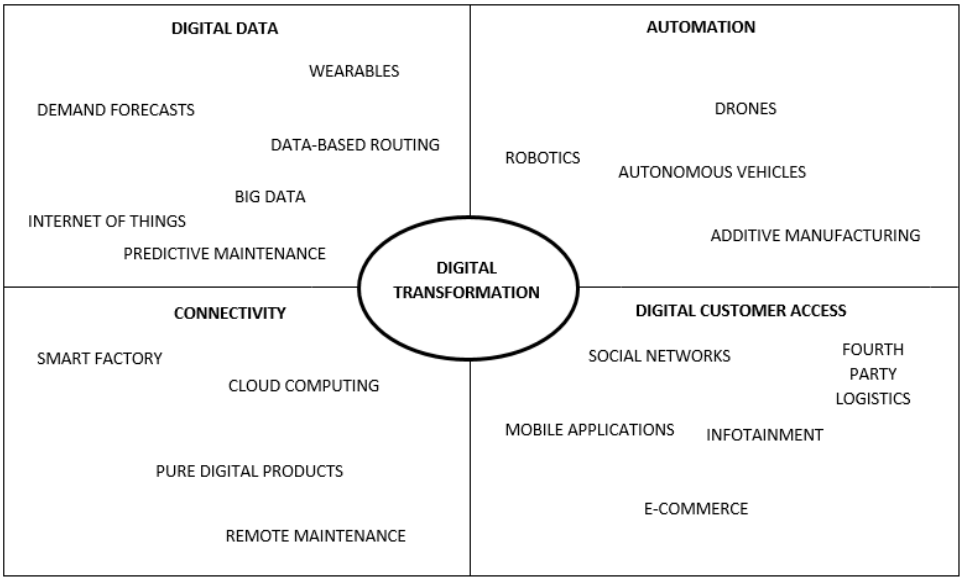

Figure 1. Dimensions of digital transformation
Source: Roland Berger, 2015, p. 7.

Individualization of demand, new ecology and mobility are thethree most important megatrends, from the point of view of the automotive industry, a branch of the world economy most sensitive to any changes in economic conditions and quickly implementing new business solutions (Ruff, 2015, p. 38). Individualization means consumers' resignation from purchasing mass products. Consumers are now non-conformists, their lifestyle is changing all the time. A new dimension of ecology focuses not only on saving natural resources and their rational consumption, but on maintaining harmony between the environment and societies, investment in local communities and their resources. Construction of large corporations' factories is connected to e.g. formation of nursery schools, housing, settlements, schools, parks, forests, saving local wildlife, etc. A young generation, called "millennial generation" or the "Millennials"[1], setting new trends in mobility, is more mobile than previous generations: Generation X and Baby Boomers[2], although in this area there are big differences between the Triad[3] and BRIC[4] countries. The BRICs continue to develop traditional forms of mobility, these markets are still unsaturated. In turn, the Triad markets develop new models of consumer behaviour, also in terms of people's mobility (see Table 2).

[1] Millennials, also known as Generation Y: a generation born in 1986-1999.
[2] Generation X: a generation of people born in 1965-1985. Baby Boomers: a generation of people born in 1946-1964.
[3] Triad countries: USA, Japan, Western Europe countries.
[4] BRIC: Brazil, Russia, India, China.

Table 1. Megatrends in the global economy

Areas of changes	Description
feminization	a growing role of women in building the global economy, emphasis on parities at the middle and senior managers level in multinational corporations
individualization	desire to receive tailor-made goods and services produced according to a customer's design; resignation from purchase of mass products
silver revolution	a growing role of people over the age of 50 in development of a socio-political-economic life
globalization	further deepening of business internationalization processes, directing global corporations' activities to new regions, including Africa
new ecology	combining environmental activities with the activities of CSR
webbyness, digitization	a growing role of the Internet in shaping business and social environment
mobility	changes in people's mobility, changes in ownership models
learning from the nature	adaptation of mechanisms governing the nature to create artificial intelligence
technological convergence	combining many technologies previously available in separate products in a single product
work changes	growing popularity of remote work (telecommuting); few jobs in a stationary form
growing risks connected with resources and energy	shrinkage of natural resources; searching for alternative sources of raw materials
climate change	destruction of plant and animal species; global warming
growing complexity	a growing number of participants in supply chains and relationships between them; multi-variant production

Source: own elaboration based on Winterhoff, Kahner, Ulrich, Sayler & Wenzel, 2009, p. 4; Burmeister, 2013, p. 6.

Table 2. Types of future mobility behaviour.

Region/Area	Type of mobility (% of users)	Description
Triad countries	Greenovator (27%)	a dominant type of mobility in the future combines care of the environment, work-life balance, high quality of life restrained in pursuit of luxury and a consumerism goal: environmental aspects, running costs, product durability
	Family Cruiser (11%)	patchwork family members - mobility is necessary, because of frequent visits to family members, mobility means high quality of life, use of inter-family car sharing goal: unlimited mobility for all family members

	Silver Driver (24%)	drivers aged 50 and over focused on enjoying life, new experiences, adventure, fun, sports competition, participation in social life goal: preserving autonomy of mobility, comfort, safety
	High-frequency Commuter (24%)	job nomads, have to commute daily (far away) to work usually residents of suburban areas, looking for the possibility of effective, flexible movement in the metropolitan areas mostly women usually rides funded by the employer car is a dominant mode of transport goal: low cost, speed, flexibility
	Global Jet Setter (2%)	constantly on the move, often change location (also in the field of housing and work) multi-mobile workers, smart mobility services-oriented, can professionally manage the mobility goal: quality of life, comfort, luxury, speed
	Sensation Seeker (4%)	like to drive a car for pleasure, it is a second home for them, combine it with individuality and freedom, their behaviour is related to the trend of the new ecology, goal: recreation, high quality of life, self-realization
	Low-End User (8%)	cost-oriented looking for inexpensive mobility solutions, are able to give it up for the lower cost of living goal: low costs
BRIC countries	Basic (48%)	having their own car gives them social advancement for them mobility is a sign of modernity and participation in the global economy very large group goal: saving energy, low price of a car, functionality
	Smart Basic (43%)	looking for mobility solutions that highlight their social advancement more focused on comfort and individuality than Basic Consumers not only want to imitate consumers from the West, but also focus on issues related to environmental protection and CSR goal: comfort, individuality, low cost, environmental aspects
	Premium (4%)	perceive luxury as expression of self-esteem and social status accept high prices focused on originality goal: luxury, individuality
	Others (5%)	

Source: own elaboration based on Winterhoff et al., 2009, p. 31-56.

Due to different types of customers and their needs, as well as regional diversity in these areas, changes in business models will be necessary.

BUSINESS MODELS OF THE FUTURE

Megatrends affect almost all economic sectors, including the automotive industry (see Table 3). In particular, three breakthrough technologies will transform the automotive world in the integration and convergence process (Seba, 2014):

- electric mobility (e-mobility),
- autonomous cars (AVs),
- solar energetics.

Table 3. Changes in the future automotive market

Changes in the automotive industry	Description
Shifting markets and revenue pools	New business models will increase the revenue of the automotive industry by approx. 30% to 1.5 trillion USD
	Despite emergence of mobility services, car sales will continue to grow, albeit at a slow pace - approx. 2% per year (in the Triad a decline in sales will be seen, in China and India – a significant increase).
Changes in mobility behaviour	One out of ten cars sold in 2030 will be a shared vehicle. 30% of cars in 2050 will be shared vehicles.
	Mobility in the city and in the country will be different. Mobility services will develop primarily in the city, in the country there will be a traditional model of ownership.
	15 percent of new cars sold in 2030 could be fully autonomous and 50% - mostly autonomous.
	Significant differences in development of the sales of electric cars will be seen (it will vary strongly at the local level). 10 to 50% of cars sold in cities in 2030 will be totally electric (10% in smaller cities, 50% in megacities)
New competition and cooperation	Incumbent players (like Tesla, BYD) will be forced to simultaneously compete on multiple fronts and cooperate with competitors. OEMs will have to extend their product portfolio with MaaS services
	New competitors (mostly software providers) will initially target only specific, economically attractive segments and activities along the value chain

Source: own elaboration based on Mohr, Kaas, Gao, Wee & Möller, 2016, p. 6-14.

L. Neckermann refers to these changes, speaking of three objectives, which the automotive industry pursues: zero emission, zero accidents, zero ownership (Röhrleef, 2015, p. 9).

M. Winterhoff et al. (2009) list four main business models of the future automotive industry, but two of them, namely Product Focused Manufacturer and Service Focused

Manufacturer, exist today. In the future, their business profile will not change much. There will be new business models related to the new standard of mobility (Basic Mobility Provider and Mobility Service Provider, see Table 4). A business model of BMP applies to a situation in which a mobility service is a subject of transaction (Spickermann, Grienitz & von der Gracht, 2014, p. 203, 216). A customer does not own a product, they only borrow it from its owner. New services – mobility services – will appear in the future market (a group called Mobility as a Service). In turn, PFM model tends in the opposite direction - to further strengthening of the ownership model. It is perfectly possible that, due to current trends and discrepancies in the global market in terms of customer preferences, OEM (Original Equipment Manufacturers) will have to deal with building two new business models and maintain former two, depending on the sales region. Ultimately, it is possible that mobility services will dominate in the automotive market, but only in a few decades.

Due to emergence of new business models, a way of supply chain functioning will change: there will be new, significant players, as seen in a supply chain involving Mobility Service Provider (see Figure 2).

Table 4. Business models of the future

Business model	Target customers (main groups)	Offer characteristics
Product Focused Manufacturer (35%)	Greenovator (40%) Silver Driver (14%) Family Cruiser (14%) Sensation Seeker (10%) Low-End User (8%)	Products: 1) premium: a rich portfolio of products, high technologies, high quality, alternative drives 2) low-cost: a poor portfolio, simple technologies, a sufficient level of quality at low cost Services: all the services in the product life cycle Features of a sales model: simple and complex financing services (leasing, insurance)
Service Focused Manufacturer (44%)	High-frequency Commuter (38%) Silver Driver (38%) Family Cruiser (13%) Greenovator (9%)	Products: a portfolio of products dedicated to customers from the low-end and top-end market Fulfilment of basic customers' requirements of, including mobility-related Services: service packages, car sharing, limousine service Insurance, sale of parts, inspection fleet management Features of sales model: short and long-term rent, leasing, kilometres-leasing, flex-leasing
Basic Mobility Provider (11%)	Greenovator (48%) Low-End User (41%) Family Cruiser (10%)	Products: simple, reliable means of transport that generate low maintenance costs Services: basic insurance and cheap financial services, cheap mobility services Features of sales model: low rates on products offered (e.g. pay-per-use), cheap service packages, sales and order fulfilment through the Internet and call centres

Mobility Service Provider (10%)	Greenovator (40%) High-frequency Commuter (23%) Silver Driver (23%) Global Jet Setter (12%)	Products: none Services: optimal mobility-mix, combined mobility offers (including the range of different branches of transport), day-and-night mobility advisor/ manager/ assistant Features of sales model: charge for mobility-mix optimization mobility management for monthly fees or fees depending on the number of transaction call centres

Source: own elaboration based on Winterhoff et al., 2009, p. 64-69.

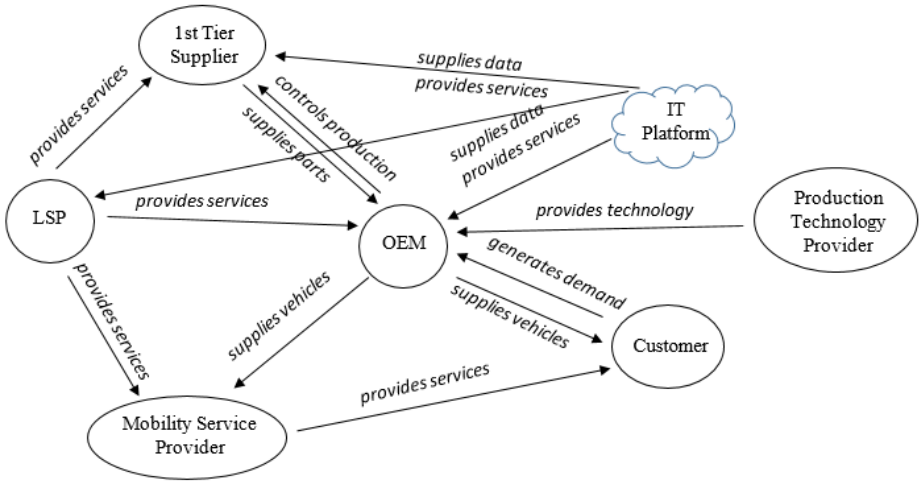

Figure 2. Reconfigured automotive supply chains of the future
Source: Roland Berger, 2015, p. 5.

OEMs will face many challenges connected with their areas of activity, because they will have to diversify their portfolio. They will have to respond at the right time to developing trends: changing mobility in cities, a traditional model in non-urban areas, a new nature of demand, not global but regional one, aftermarket and repair services development, increasing customer willingness to choose more differentiated solutions, development of electronics, etc.

According to McKinsey experts, OEMs should prepare for these changes in four dimensions (Mohr et al., 2016, p. 15-17):

1. Preparing for uncertainty: market players will have to prepare for market changes before they occur, which will allow them to proactively study customers, types of cities, regions, demographics, emerging economies, etc.;
2. Establishing beneficial partnership: all supply chains participants will have to make beneficial alliances in the sector and beyond. They will share research and development costs, also launching the product. Still, OEMs should control value chains and business ecosystems;

3. Organization's adaptation to the environment conditions: first of all they should be internally integrated, which will be difficult in case of global supply chains. Software will be a key element in it. They will need to adapt purchases, research and development, a product life cycle, launching of new versions of models and other areas.
4. Transforming product proposals: to maintain a market position, producers will have to continually increase variety of products and services (B2B and B2C).

MOBILITY AS A SERVICE (MAAS)

In the era of ubiquitous networking and the Internet of Things, mobility will be one of the key elements of human life, which can be seen also today, especially in large cities (Ambrosino, Nelson, Boero, & Pettinelli, 2016). Mobility may become the central element and the purpose of life of residents, living at a fast pace and traveling between multiple locations in the city, limited by prohibitions of parking and access to city centres. The nature of work of city residents will change, it will be more remote than ever. In addition, shortening product life cycles, also in the automotive industry, will result in a significant decrease in willingness to buy new cars (Dodourova & Bevis, 2014, p. 252-253). This combined with the approach to life of the Millennials, focused on the use of things, not their possession, will result in significant rise in demand for mobility services. Services will replace possession of things.

The trend, which is not yet visible, but its first symptoms are starting to appear, is Mobility as a Service (MaaS). Today, the SaaS (Software as a Service) business model is growing dynamically, smartphones are in common use, virtual applications are developing very fast. MaaS would rely on renting a car from its owner in order to take a particular route. Combined with a concept of an autonomous car, it would cause a revolution in the global market. It would also match a lifestyle and way of thinking of the Millennials, as well as the ubiquitous trend of digitization of life and convergence (including media, technology convergence and its other dimensions).

Mobility as a Service is a concept that already exists, mainly thanks to applications and Internet platforms offering car sharing and route optimization, consisting in usage of different modes of transport, while buying tickets from only one seller. If such solutions are available for different means of transport (including alternatives such as a bicycle), cars may join them. KPMG predicts that in the Triad countries, in 2029 25% of large cities inhabitants will daily use solutions designed for optimization of routes within the city, benefitting from car rentals and other means of transport (KPMG, 2014, p. 21).

MaaS would apply not only to cars available within large fleets supplied by Basic Mobility Providers and Mobility Service Providers, but also to individuals who do not use their cars all the time. There are also ideas to use trunks of these cars as mobile stores (KPMG, 2015), in which courier packages could be carried. All these changes will affect courier business, trade on Allegro, Ebay and similar websites, and even a method of delivering pizza, which may no longer be a man-performed process. For example, a car's owner comes to work for 8 hours, and meanwhile their car is used by others. This way, the car will generate additional income for the owner, while so far it has been generating only costs. At the time specified by the owner, their car will be waiting at the

workplace, ready for the way back home. During this return, the owner will be entertained by watching a favourite show, film, or will be completing overdue, unaccomplished work tasks.

New business models associated with MaaS will also generate new needs in the insurance field, such as collision, comprehensive and third party insurance. There will be entirely new insurance products intended for owners of large fleets, as well as individual ones, offering their cars to other users. A revolution in this area of the economy will be inevitable.

The greatest MaaS solutions will be provided by companies offering mobility services and having their own fleets, which may be called network fleets. Network connectivity between cars allows, for example, for exchange of information on congestion, road accidents, weather, etc. Such solutions have already been introduced in the industry (for example Daimler has implemented FleetBoard and Detroit Connect systems, which connect 365 thousands of vehicles worldwide; Hansen Report, 2013). It is expected that the solutions for the Internet of Cars (IoC) will contribute to minimization of external transport costs, safety improvement, increase in speed of routings execution. The IoC type solutions will be necessary also because of further development of car transport: by 2050 the size of this carriage type is expected to triple (Bolton, 2016).

16–25% urban population will benefit from mobility solutions is in case of the Triad and Russia, and 6–15% – in case of China, India and Brazil (KPMG, 2014, p. 22). So it confirms what has been shown in models of consumers in the BRIC and Triad countries: the Triad residents will be more likely to create and adapt new business models, while in the BRIC countries the traditional sales models will continue to dominate.

Emergence of new business models related to, among others, car sharing will result in disruption of existing relationships in the market and shifting operational frameworks of entities. There will be great changes relating, for example, to functioning of taxis or even their disappearance in some regions. Dimensions, such as time and place, will affect people's functioning. There is a great potential for companies producing cars, and electronic components, software, but also for service providers to increase market share (ThinkTank, 2016).

Stationary services will become mobile, and new services will appear (see Table 5). Hotels will experience decline in demand for services, because autonomous cars will offer transportation of passengers to a desired location during the night, offering onboard sleeper seats. Appearance of autonomous vehicles will cause development of passenger carriers: some of them may be present members of the hospitality industry. Probably there will be a boom of other "during-day" or "daily" services, such as therapeutic, insurance, financial consulting, beautician, hairdresser, restaurant ones ("dine while you drive" will replace previously known drive-in and coffee-to-go) (ThinkTank, 2016). There will also be large autonomous vehicles that could fulfil residential functions - seasonally or all year round. It will bring new opportunities, but first and foremost it will be a challenge for the industry, because such services have to be produced on order, the current level of complexity is growing very high, and the BTO (Build-to-Order) and similar concepts are becoming permanent not only in the automotive industry, but also other sectors dependent and independent from it. So interest in particular areas, such as the furniture business, finishing, design, installers, will increase. It will be also beneficial for service providers, operating on the roads, mainly service and repair facilities.

Table 5. Traditional and new business models in mobility.

Traditional/ new model type	Model	Description
Traditional	Car rentals	Renting a car for predetermined number of days
	Taxis	Point-to-point transport of passengers
	Carpooling/ carsharing	Transport of riders by non-professional driver based on fixed schedule departure and close destinations of co-riders
New	E-hailing	On-demand hiring of a private car by a group of riders (using an application and an electronic device)
	Shared e-hailing	On-demand hiring of a shared-occupancy car by multiple drivers (using an application and an electronic device)
	Car sharing (fleet operator)	On-demand short-term car rentals from its owner (fleet operator)
	Car rental (peer-to-peer)	On-demand short-term car rentals from its owner (individual owner) using an application, website and electronic device
	Carpooling 2.0	Carpooling with the use of a virtual application and an electronic device

Source: Betoncello & Wee, 2015.

A work model of, for example, sales representatives will change. They will be able to perform operations, not focusing on driving but on making phone calls to clients, sending e-mails. An already created term "job nomads", referring to a new employee model, is gaining popularity (ThinkTank, 2016). Offices will become, in many cases, unnecessary, significance will lie in efficient work, not a number of hours spent at the work desk. It is possible that many drivers will miss a traditional system of driving.

AUTONOMOUS VEHICLES (AVS)

A concept of autonomous vehicles has been successfully implemented in warehouses, seaports, also about ten years ago in research (Google cars). Roads and streets of the future will look very different than today. Many car manufacturers (OEM), such as Volvo, Mercedes, BMW, are declaring launch of mass production of autonomous cars (Bussgeldkatalog, 2016). Different automakers have assured that by 2025 (some by 2017) they will have produced a fully autonomous car. Even a town for testing autonomous cars has been built (Ann Arbor, Michigan, USA). Mercedes and Daimler call this concept "intelligent drive". A realistic scenario assumes that by 2050 autonomous vehicles will have dominated Western roads (Bussgeldkatalog, 2016). Some sources say that it will happen earlier: between 2025 and 2030 (ThinkTank, 2016). However, it is expected that by 2020 there will be 10 million autonomous cars (McLaughlin, 2014). Undoubtedly, electronics and software will have become 50% of car cost by 2030 and autonomous cars

will be connected with each other and with intelligent infrastructure (a concept of advanced connected car).

The Business Insider 2016 report shows a division of autonomous vehicles into two main groups: semi-autonomous one and fully autonomous one (Greenough, 2016). Semi-autonomous cars are today present in the market and offer, for example, self-parking. Fully independent vehicles do not require driver's intervention, apart from specification of a starting point and a destination. Their introduction is expected in 2019. They can be further divided into operated by a user and completely independent. The first ones (also due to legal restrictions and a lack of legal and insurance solutions) will enter the market in the next 5 years, completely independent – much later (see Table 6).

Table 6. Eras of autonomous cars development

Era	Years	Characteristics
I Fully autonomous vehicles being developed for consumers	2015-2028	AVs are parts of industrial fleets Car OEMs assess strategic impact of AVs (they have to choose they want to be premium incumbents, attackers, fast followers or late entrants/non-adopters in the market) New mobility models are emerging (pay per use, car-sharing, peer-to-peer car rentals, e-hailing) Vehicles communicate with each other
II Consumers begin to adopt AVs	2028-2038	Aftersales service landscape is reshaped (aftersales service providers offer vehicles; vehicles are often repaired and have a longer life cycle than today) Insurers shift from covering individuals to covering technical failures and add new products for e-mobility users Logistics and supply chains are redefined – a supply chain will be reconfigured, fully automated, more flexible Car ownership declines Bus services and logistics services are disrupted Vehicles communicate with infrastructure
III AVs become the primary means of transport	2038-2050	AVs free a time for drivers Ubiquitous autonomous door to door travel is available Parking demand and space is reduced Vehicle crashes number falls Congestion level falls AVs are a base for developing robots for consumer use

Source: Bentocello & Wee, 2015, Röhrleef, Deutsch & Ackermann, 2015, p. 5; Rodoulis, 2014, p. 13.

Consequences of autonomous vehicles include (McLaughlin, 2014; Gruela & Stanford, 2016, p. 21-25):

- fewer car accidents, therefore lower financial losses and fewer victims,
- revolution in automotive design: some car components will become unnecessary (for example windscreen), but many more will appear (especially electronic ones),

- reduced fear of an accident and eliminated fear of driving: even though it is hard to believe, there are some drivers who are terrified of driving,
- changing routes, signs, lights, etc.: nowadays drivers react differently to the same signals received on the way, their response time, for example to a traffic light, is different and so are habits, such as not stopping at a yellow light; future behaviour of autonomous cars will be standardized, they will adapt well for example to weather (a predictable machine vs. a non-predictable man),
- changing driver-related restrictions: now a driving license is a sign of maturity, adulthood, in the US it is actually the primary identity document. In the future, an independent, solitary trip on a self-driving car will be available to currently excluded groups, i.e. for children (cycling card holders), the elderly, the disabled or people returning from parties.
- destruction of the "car culture": a car, especially for a man, is a sign of independence and a social status. Drivers like to drive a car for pleasure, visit new places to chill out. But Avs appearance is a sign of progress, similar to that of abandoning horse-riding when a car appeared on a massive scale,
- development of telework (telecommuting): work on a car is also associated with reduction of risk of accidents, which is now high, when a driver is talking on the phone. People who work away from the family or need to commute on long distance could benefit from introduction of autonomous cars and stay longer with their family,
- development of radio and television advertising: more prime-time intervals for commercials,
- destruction of taxi drivers and chauffeurs workplaces: not all but it will be noticeable in the sector,
- erosion of privacy: the use of car-rental applications, as well as logging on the car-steering programs will be the same as a current Gmail account with dedicated advertising,
- development of legal regulations, including insurance (including collision, comprehensive and third party insurance), privacy, penalties and fines, traffic offenses. However, it will be easier for the police to trace a wanted persons,
- reduction in car thefts: an indirect effect, even though electronic crime may develop instead,
- reduction of visibility of social differences and an improved situation of those who cannot afford to have a car, poorer people will be able to enjoy good and new cars without buying them,
- greater sensitivity to natural phenomena, natural disasters and terrorist attacks - disturbances caused by, for example, hurricanes may cause a break in continuity of GPS and other systems; a central system of supervising car operation will be a target of terrorist attacks,
- changes in urban transport systems: more infrastructure components, partial withdrawal from traditional elements of the offer for the residents,
- further studies on mobility - for example aimed at flying cars.

Some systems for autonomous vehicles have already been introduced in the cities such as Singapore, where they primarily go to university campuses. A similar system

operates in Rotterdam. So far these are very limited solutions (vehicles move along several possible routes). However, some solutions are very interesting (for example, vehicles read, when they should return to the charging station) (Hanley, 2016). Most US states had already approved driving autonomous vehicles (Nevada in 2011 was the first state). In 2015, Tesla put an autopilot in its cars Tesla Motors Model S, which means the beginning of the sale of fully autonomous cars, but so far in a very limited quantities (Insurance Information Institute, 2016).

A vision of an autonomous car spins Google as well. It promises to introduce it commercially, not only for its own research purposes. These cars will not have a steering wheel, brakes or accelerator. The new business model from Google favours the Robo-Taxi model, in which car rides will be provided on demand. Google also wants to dominate the market, providing maps and software for self-driving car (Jiang, Petrovic, Ayyer, Tolani & Husain, 2015, p. 5). The new entrant, Google, is expected to capture 8% of the total car market by 2035. Google plans to release the following four technologies within four years (Jiang et al., 2015, p. 9):

- offering autonomous mobility services such as Robo-Taxi (this has a potential of reducing car ownership three times),
- producing and offering specialized maps and software,
- providing technology for monitoring traffic reduction systems,
- providing technology for robotics (probabilistic inference, planning and search, localization, tracking and control)

Implementation of the concept of autonomous cars involves a number of solutions in products, for example (Jiang et al., 2015, p. 4-5):

- Automated Park Assist Technology (available today, the first application in the Toyota Prius) - self parking without driver's participation,
- Adaptive Cruise Control Technology: are to be installed in cars as early as in 2016 - keeping a safe distance between a car and other objects on the road,
- Automated Highway Driving Assistant (2018): a system that allows a fast ride on the highway passing and overtaking other vehicles,
- Autonomous Driving Highway (2020): a car in which the driver may cede all control over the safety to driving control systems.

CONCLUSIONS AND FUTURE RESEARCH DIRECTIONS

Change in a lifestyle of residents (especially young people living in large cities) will cause a revolution in current mobility patterns. A concept of sharing economy will spread, new mobility solutions based on the MaaS will be introduced. Semi-autonomous and fully-autonomous vehicles will accelerate these changes by offering mobility solutions to disabled people and those not having a driving license. These will be just some of the trends, in addition to development of Hyperloop technology and magnetic trains, which will change the face of future mobility. These changes are unavoidable in the face of megatrends visible in the global economy for decades. But the most important change drive described in the paper will be definitely emergence of Y generation – its behaviours, convictions, values hierarchy and the demand created by them, characteristics of which will be totally different from the ones shown by previous generations.

The area of changes in people's mobility in cities, suburban areas, villages and the differences between the mobility patterns in the countries of the Triad, BRIC and other areas of the globe is largely unexplored. There are few studies on this subject, mainly business analyses of practitioners who study the topic selectively or relate only to one sector or transportation mode. Future studies should cover not only a detailed analysis in this field, but also a comprehensive model of future mobility. Especially, there is a need for empirical research into the mentioned area. An interesting topic of the research into the changes described in this article will also be reconfiguration of future supply chains connected with emerging of new business models.

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