Autonomous driving – are OEMs losing the driver seat?

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On the road to Autonomous Driving – the business perspective

Autonomous driving is becoming the hot topic of discussion in the automotive industry. Premium car-makers such as Audi, BMW and Daimler have showcased their know-how by trialing their prototypes on test courses and selected routes. Tesla has announced that their Model S customers will have the option of being driven by their car within the next three years.

Simultaneously, new competitors are entering the market: Google has tested its first driverless automobile on public streets and Apple considers the car to be the “ultimate mobile device” – this against the backdrop of ongoing rumors of a potential Tesla takeover which would provide Apple with an auto-piloted car.

Automotive OEM’s have of course begun to ask themselves how this technology will impact their future sales.

The answer is simple: the advent of autonomous driving promises significant additional profit pools on the way to continuing “service diversification”.

At the same time it reveals a substantial disruption threat from non-automotive companies that are currently challenging the rules of the game. Hence, the key questions raised in this paper are: which additional business opportunities with respect to autonomous driving will arise?

And, more importantly, what could future business models look like for automotive OEMs? After describing the meaning of autonomous driving, these challenging questions will be discussed in detail.

In essence, this Point of View argues that industry leadership may be maintained through business model adaptation, but that the ongoing shift towards holistic mobility solutions presents substantial challenges for OEMs.

The market potential of Autonomous Driving.

To create a coherent understanding of autonomous driving, it is necessary to establish a precise definition. According to the US National Highway Traffic Safety Administration different levels of autonomous driving are distinguished with respect to the level of that automation.  

Currently, premium vehicles have already reached Level 2 automated functionality with, for example, the simultaneous operation of adaptive cruise control and lane assistance. Autonomous driving, as we refer to it in this paper, is considered a transportation mode where the driver does not have to monitor the system.

Industry forecasts expect OEMs to be expanding their advanced driver assistance systems further (eHorizon, Adaptive Cruise Control etc.). They estimate that the OEMs are also likely to begin small-scale deployment of Level 3 partially autonomous cars (automated vehicles with limited driver intervention) within the 2020 timeframe.  

Autonomous Vehicle Sales, Worldwide: 2020 - 2050

in units (million)

![Autonomous Car Market Growth (Level 3 and 4, NHTSA).][1]

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1 Level 0 (No Automation): The human driver is in complete control of all functions of the car.
2 Level 1 (Function-specific automation): One function is automated.
Level 2 (Combined function automation): More than one function is automated at the same time, but the driver has to remain attentive all the time.
Level 3 (Limited self-driving automation): The driving functions are sufficiently automated so that the driver can safely engage in other activities.
Level 4 (Full self-driving automation): The car can drive by itself without a human driver.

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1 IHS Automotive 2014 and Accenture research.
OEM sales of Level 4 fully autonomous cars will start slowly in 2020 but are predicted to experience rapid growth with the beginning of volume deployment in 2025. This development is illustrated in figure 1.

In order to realize the growth illustrated above there are, among others, key major obstacles that need to be overcome. As there will be a shift in responsibility from the driver to the automated car functions, liability aspects need to be clarified.

These automated functions perform actions based on decisions derived from algorithms so there is the potential for ethical dilemmas to arise. What happens if a car is presented with the choice of protecting the driver and passenger in the car or a child crossing the street?

The trilemma between obeying legal rules, ethical questions and the cost of an accident needs to be solved before the system takes to the road.

New challenges drive need for business model transformation

Even though the market potential is substantial, on a business level this new technology involves three key challenges for OEMs:

First, driverless cars attract new non-automotive competitors blurring industry boundaries. Due to further digitalization of the vehicle itself and its environments, new tech competitors will enter the automotive industry, able to build cars and provide add-on services (see infobox).

Secondly, new customer offerings emerge as customers increasingly wish to consume services beyond simply moving from A to B. In this context, the most important enablers on the road to autonomous driving are “connected vehicles” and service ecosystems, as they have already triggered a change in OEMs’ business perspective.

Location-based connected services have become an integral part of the driving experience and autonomous driving customers will value the additional time and opportunity to enjoy advanced connected convenience and infotainment features while on the move and they will expect these commodities.3

Thus, the opportunity arises to generate additional revenue streams from in-car purchases by providing consumers, for example, with access to their financial products. The value proposition that customers look for will also have to include a seamless digital service experience.

Consequently, traditional factors such as engineering excellence and continuous mechanical innovation and refinement aimed at pure driving satisfaction may become subordinate considerations in the minds of future car buyers.

Automotive OEMs need to be aware of service-oriented tech companies

As illustrated by figure 2, besides pure financial figures, the technical capabilities and access to more than two billion customers present an obvious risk to OEMs, as these companies could apply their approach of an open innovation ecosystem to the car, rendering the car an interchangeable commodity.

3 For further information on connected car issues, please refer to Accenture’s PoV “The future of connected car. Part 1: OEMs vs. tech giants – winning the battle for customer access”.

Figure 2: Market Cap and cash positions of tech vs. automotive players.
OEMs will have to become evermore customer-centric if they are to meet the challenge of producing offers that continue to create value in the face of these shifting expectations and priorities.

Thirdly, further digitalization forces a shift in emphasis across the value chain. This becomes apparent when taking a closer look at cross-industry R&D expenses.

Even though automotive OEMs invested large amounts in their R&D departments in 2014 (e.g. Volkswagen $13 bn – approximately $1,200 per vehicle), they are not perceived as innovative leaders in comparison to their new competitors, Google ($8bn R&D), and Apple ($6bn R&D). In order to keep up with the new market entrants, OEMs need to redistribute their R&D expenditure focusing more on software, IT and data analytics – areas in which tech giants are obviously first movers.

Based on these challenges, Accenture is confident that in order to play a key role in the world of autonomous cars, OEMs will need to adapt their business model. Figure 4 underlines these arguments by connecting the respective car technology with possible generic OEM business models. The business model focus may range from product to service centricity.

Service centricity may unveil disruptive forces as technological innovations ease the invention of multisided marketplaces, thus creating completely new business opportunities.

Nevertheless, as technology develops further, the IT-capability requirements rise apace. Of course, multiple combinations of service and/or product offerings and types of marketplaces might evolve in the future.
Are you ready for business model transformation?

As outlined above, autonomous driving offers significant market potentials which can be addressed by different business models. OEMs need to ask the right questions now. The answers to them are key in determining the companies' value share in the autonomous driving challenge in the long run (see figure 4):

<table>
<thead>
<tr>
<th>Critical questions and...</th>
<th>...range of answers</th>
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<tbody>
<tr>
<td><strong>1.</strong> Which will be the market positioning of automotive OEMs?</td>
<td>- asset supplier - service provider</td>
</tr>
<tr>
<td><strong>2.</strong> How does autonomous driving change vehicles?</td>
<td>- traditional powertrain - electric vehicle</td>
</tr>
<tr>
<td><strong>3.</strong> What additional capabilities do OEMs need in the future?</td>
<td>- engineering - software/digitalization</td>
</tr>
<tr>
<td><strong>4.</strong> How does autonomous driving change customer behavior?</td>
<td>- ownership of desired property - commodity</td>
</tr>
<tr>
<td><strong>5.</strong> What is the value add of autonomous driving for customers?</td>
<td>- driving convenience - in-car services</td>
</tr>
<tr>
<td><strong>6.</strong> Which OEM revenue sources are affected?</td>
<td>- sales - aftersales</td>
</tr>
<tr>
<td><strong>7.</strong> What is the OEMs role in providing in-car services?</td>
<td>- enabler - producer</td>
</tr>
<tr>
<td><strong>8.</strong> How can OEMs monetarily benefit from in-car services?</td>
<td>- license business - self build</td>
</tr>
<tr>
<td><strong>9.</strong> Who owns and utilizes customers data?</td>
<td>- ICT - OEM</td>
</tr>
<tr>
<td><strong>10.</strong> How do OEMs cooperate with ICT companies within R&amp;D and during car usage?</td>
<td>- isolation - integration</td>
</tr>
<tr>
<td><strong>11.</strong></td>
<td>- ...</td>
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Figure 4: Critical Questions in the Context of Autonomous Driving.
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Authors

Accenture Digital
Dr. Gabriel Seiberth
Christian Schmitz
Roger Hampel

Accenture Strategy/Operations
Johannes Trenka
Matthias Tix
Lisa Flügel
Sophie Hochwarter

Accenture Strategy/Automotive
Dr. Sebastian Rauber

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