Three reasons why incumbent OEMs might become the dominant actors in the autonomous commercial vehicle industry

Three reasons why incumbent OEMs might become the dominant actors in the autonomous commercial vehicle industry

The automotive industry is currently facing a new technology paradigm driven by autonomous vehicles pushing OEMs into one of their greatest challenges yet: mastering the fundamentally new technology capabilities related to autonomous driving. The industry is currently looking at the need to move from today's prototype autonomous solutions derived from years of advanced engineering research towards safe, industrialized solutions – a long journey and likely one of underestimated length. As described in the first article in this series, the future of the automotive industry and the competitive landscape is more uncertain than ever before, with startups going head-to-head with OEMs, new actors from nearby industries entering the field and incumbent OEMs forced to make strategic decisions impacting their future competitiveness.

Fundamentally, an autonomous vehicle consists of three main building blocks that need to be mastered together with a solid verification and validation method to confirm system safety and several enablers, such as infrastructure and connectivity, to make the autonomous system work.

- Automated Driving System Dedicated Vehicles (ADS-DV)
  - A base vehicle with redundant systems (braking, steering, power systems etc.)
- Automated Driving System (ADS)
  - The self-driving software, including a perception system (typically Lidar, Radar, Camera) and dedicated hardware (such as ECUs)
- Transport Management System (TMS)
  - The off-board system that sends mission and route management information to the autonomous vehicle, which it then executes according to commands

However, as previously stated, there is some uncertainty as to whether incumbent OEMs will manage to develop and commercialize a complete autonomous vehicle themselves or be challenged by new actors and startups. Below are three arguments as to why incumbent OEMs will succeed in outdoing other actors and maintain – and potentially even expand – their position in the value chain.

1. **Developing an autonomous vehicle requires substantial truck and transport solution knowledge – knowledge that OEMs have**

   Typically, incumbent OEMs are better prepared to build a safe and reliable ADS-DV capable of managing the challenges related to autonomy as it is close to their current core business and heritage and, as such, is a natural step to take. With the driver removed, a base vehicle must manage every situation on its own, so redundant steering, braking and power systems are of critical importance, together with knowledge of vehicle dynamics and how the truck will perform at any given time and under any given road conditions as input to the decision making process in the ADS.

   On the other hand, solid ADSs and TMSs require state-of-the-art software development work not considered a core competence among incumbent OEMs, at least not in comparison to software development companies such as Google and Uber. However, since substantial truck and transport solutions knowledge is needed to develop efficient ADSs and TMSs for commercial vehicles, a trade-off for OEMs arises as to whether they should partner up with dedicated software development companies or amass the necessary capabilities inhouse.

   It is likely that flexibility and responsiveness to change are key to commercializing autonomous vehicles. Normally, flexibility and responsiveness to change are managed through outsourcing and supplier relations. However, a traditional supplier/OEM relationship could be questionable due to the many unknowns in automation development and the substantial numbers of change requests required during the development period. Accordingly, a strategic partnership could be a solution, although the dependency on the partner over time for changes and the scaling of autonomous solutions will most likely make incumbent OEMs think twice before deciding whether to invest in developing and commercializing the technology themselves or not.

2. **OEMs can utilize the benefits of starting operations in confined areas and then bringing those solutions onto public roads – something that new actors might struggle with**

Developing autonomous commercial vehicles is a complex task. A likely development strategy is to start operations in confined areas to test the systems in real but controlled environments, and this can be done significantly earlier here than would be possible on public roads. The solutions can then be brought onto public roads. Assuming this turns out to be a successful development strategy, it is likely that OEMs will be the dominant actors in the autonomous commercial vehicle industry.

The reason for this is that an understanding of customer operations and demands is central to delivering an efficient autonomous transport solution for commercial applications in confined areas (such as mines and ports, for example). Even though the recommended approach would be platform-based, with a single platform suitable for use in several applications, this would still require adaptations for each specific customer, such as for integration with the customer's site or production system. Accordingly, close collaboration between customers and technical development teams is key. This is something that OEMs are positioned to manage since they already have business relationships with end customers (such as mining companies) and a good understanding of customer needs and challenges, which comprise important input in the development of autonomous solutions for confined areas.

As for public roads, many actors are focused on developing autonomous solutions for this purpose. Among these actors, several logistic companies have begun integrating self-driving technology development (such as Uber and Amazon). However, assuming that incumbent OEMs can utilize the power of machine learning to transition their autonomous systems for confined areas into public road solutions, it is likely that they will outdo logistic companies and other tech companies targeting full-stack automation development.

3. **First-mover advantages are supposed to be significant – historically, fast commercialization of new disruptive technologies often requires significant control of the value chain – control that OEMs are best positioned to take**

The first company (and perhaps second and third, but probably not twentieth) to bring autonomous commercial vehicles to market will likely experience significant first-mover advantages. One of the main reasons is that self-driving systems are based on artificial intelligence and machine learning, meaning that the more hours or miles the system drives and encounters real-world problems, the better it gets. Through connectivity, the lessons learned by one vehicle can instantly be transferred to all vehicles, meaning that the larger the number of vehicles out there driving, the faster the system learns.

Looking back in history at other technology paradigm shifts, we can see that control of the value chain is often central to being fast to market, triggering vertical integration and access to key technology and enablers. One recent example is the adoption of electric vehicles. Charging infrastructure is a critical enabler in commercializing electric vehicles and this is something that Tesla quickly realized, consequently building their own charging infrastructure, contributing to the large-scale market introduction of long-range electric vehicles years before incumbent OEMs. Historically, vehicle fuelling infrastructure has not been a matter for OEMs, but with the introduction of electrification Tesla did not have the time to wait for someone else to provide the charging infrastructure, and so had to vertically integrate to be fast to market and build higher entry barriers.

In the context of autonomous vehicles, logic indicates that access to key automation technology is vital to be fast to market. It is likely the case that one actor will need control of significant parts of the value chain, and OEMs are best positioned to take such control. Accordingly, it is probable that OEMs will develop the automation technology themselves and/or acquire companies that already have. Once again, strategic partnerships could be a way forward, but with increased dependency as a downside.

Summary
As can be seen, there are factors indicating that OEMs might be the dominant actors in the commercial vehicle industry in the autonomous era. However, several uncertainties remain. In later articles, we will further explore other likely scenarios, describing the possible future competitive landscape of the commercial vehicle industry.

This is the second article in the series targeting how autonomous trucks will transform the commercial vehicle industry. Stay tuned for the next article in the series.

This article was written by Fortos Autonomous Transport Solution practice together with students from Gothenburg School of Business, Economics and Law. Please feel welcome to contact us to discuss this topic in greater detail or challenge our views.

WANT TO KNOW MORE?

Staffan Brahe, Partner

Head of Autonomous Transport
Solutions
Staffan.Brahe@fortos.se
+46(0)76-517 27 83

**Rikard Boije af Gennäs,
Senior Manager**

Rikard.Boije.af.Gennas@fortos.se
+46(0)73-945 66 42

**Linus Fransson, Senior
Consultant**

Linus.Fransson@fortos.se
+46(0)72-250 72 94

Transformation
is our heritage.

Fortos has a long history as one
of the most valuable advisors to
leading multinational
organizations in the Automotive
industry. We support our
customers to achieve successful
transformations through our deep
understanding of their business,
our world-class trans-formation
competence and long term
commitment to deliver
sustainable client value. Learn
more about us at Fortos.se

FORTOS

Transforming business