IHS AUTOMOTIVE
SupplierInsight

High-Tech industry Impact on Automotive: Apple and Other Potential Disruptors

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CHAPTER 1

Executive Summary

the goal. Uber's valuation of more than USD65 billion in recent funding rounds is predicated on its long-term success as a major player in mobility services via driverless fleets.

The number of companies developing software for self-driving and/or driverless cars are also impressive; there are seven companies, mostly start-ups, in this segment. Google is the pioneer and has the most experience in testing and software development. Baidu is the internet search leader in China and is developing self-driving software for the Chinese market. Baidu is a leader in deep learning technology, with a research lab in Beijing and an artificial intelligence (AI) lab in Silicon Valley. The other five companies are small start-ups involved in self-driving software development. NuTonomy is testing ride-hailing using self-driving software in a small area in Singapore.

High-tech and automotive relationships

Segment	Company	Product focus
BEVs and self-driving and driverless BEVs	• Apple	• BEV, self-driving BEV (?), driverless ride-hailing fleet (?)
	• Atieva	• Autonomous BEVs, factory planned in California
	• Faraday Future	• Luxury BEVs; factory being built in Nevada
	• Future Mobility	• Self-driving BEV, price of USD45,000 in 2020 for China
	• LeEco	• Self-driving BEV, concept at 2016 Beijing auto show
	• NextEV	• High-performance BEV; competing in Formula E racing
	• Tesla	• Luxury BEVs, BEV autopilot, self-driving BEV
	• Uber	• Ride-hailing, driverless ride-hailing testing
	• Zoox	• Driverless BEV, ride-hailing fleet, innovative technology
Self-driving and driverless software	• AdasWorks	• Deep learning and self-driving software
	• Baidu	• Driverless car software for China market
	• Comma.ai	• Self-driving car software; aftermarket autopilot product
	• Drive.ai	• Self-driving car software; display to communicate next actions
	• Google	• Driverless car software; driverless ride-hailing fleet (?)
	• Nauto	• Road infrastructure database for self-driving cars
	• NuTonomy	• Driverless car software; ride-hailing tests in Singapore
Sensor and others	• Local Motors	• 3D-printed cars; open-source, collaborative design software
	• Quanergy	• Chip-based lidar sensor and systems
	• Velodyne	• Family of lidar systems

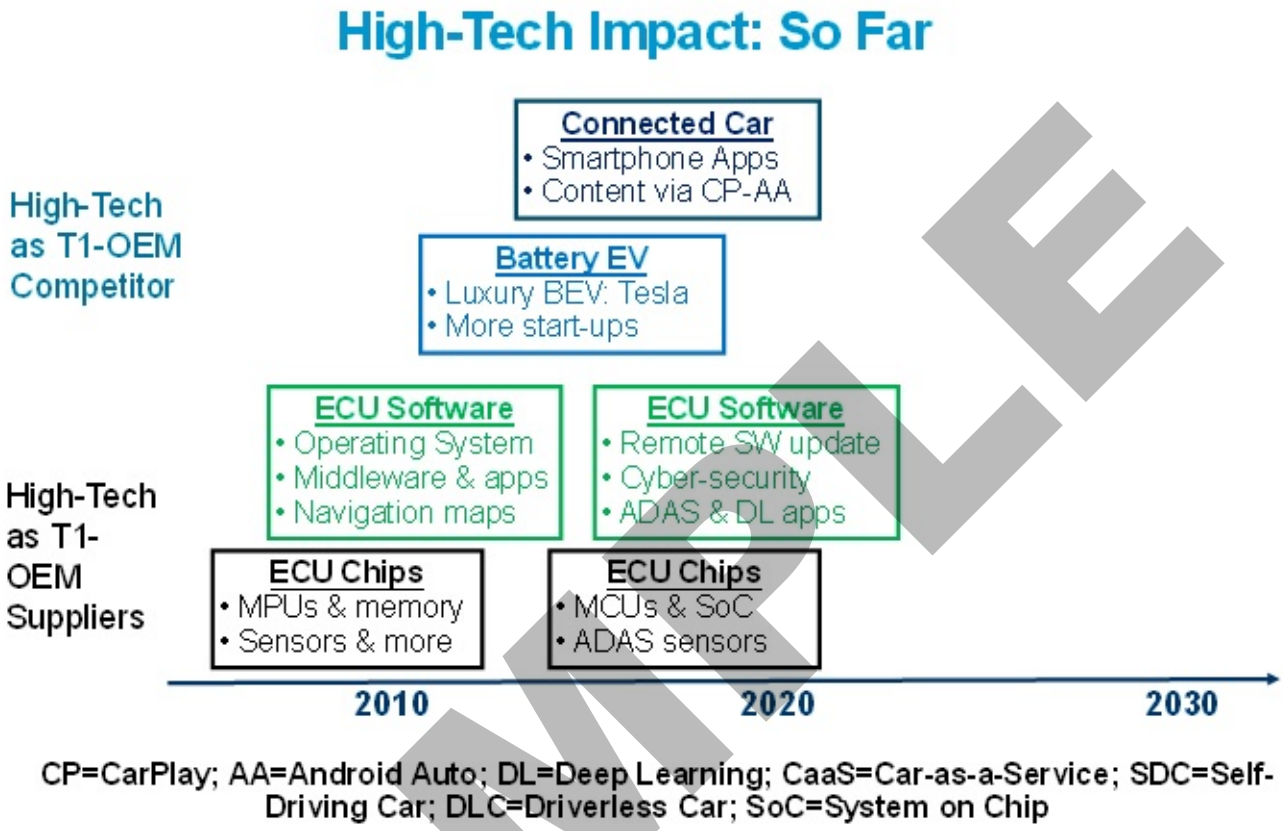
Comma.ai has announced an aftermarket autopilot for a few Acura and Honda models that only costs USD999 plus a USD24 fee per month for software updates. Drive.ai has an innovative feature, which is called human-robot interaction (HRI)—a display that lets the car communicate its next activity directly to pedestrians, bicyclists, and human drivers.

Local Motors is unique and is using 3D printing to produce a significant portion of a BEV chassis and other parts. Velodyne is the leading supplier of lidar systems used by most companies testing autonomous and self-driving cars. Quanergy is a start-up that will leverage chip manufacturing to steeply lower the future price of lidar systems.

In summary, the potential of the future mobility services market using driverless fleets will be quite large and will become a major opportunity for the high-tech industry and the auto industry. The leading auto manufacturers are taking growing high-tech competition seriously. The leading auto OEMs are active in developing autonomous driving technologies and will become major players in self-driving and driverless vehicles segments. Both the high-tech industry and the auto industry will likely have some success in the large future driverless fleet mobility market.

Overview

The auto industry has used products from the high-tech industry for several decades. This relationship is changing; the high-tech industry is also becoming a competitor in some segments of the auto industry. The following figure is a big-picture summary of these trends so far.



In this relationship, the high-tech industry has primarily been a supplier to the auto industry. Initially, the high-tech industry mostly supplied chips for use in the growing number of auto electronics systems—electronic control units(ECUs). Next came software as ECU complexity increased and the infotainment or head units became multifunctional, with navigation systems and media players. Infotainment then needed a complex operating system, which came from the high-tech industry.

The first era of the connected car, telematics systems, came mostly from the auto industry. As car connectivity added smartphones as the wireless communication link, the high-tech industry is taking a larger share, and with Apple CarPlay and Android Auto, the content portion of infotainment is shifting to the high-tech industry. These connected car systems also need additional software from the auto industry for over-the-air (OTA) software updates and cybersecurity software and hardware. However, the high-tech industry will retain mostly a supplier relationship for OTA and cybersecurity.

This competition from high-tech will likely increase substantially in the future owing to three main products:

- Battery electric vehicles (BEVs)
- Self-driving vehicles
- Driverless vehicle fleets for mobility services

These three product categories are based on many technologies coming from the high-tech industry, with significant adaptations to be able to work in the auto industry.

BEV opportunities are already allowing start-up companies from the high-tech industry to compete as auto manufacturers, but at very low volumes currently. As the BEV product category becomes more desirable owing to better technology, its sales volume will grow and more BEV start-ups will enter. Tesla is considered a success story that many start-ups are trying to copy. Many of these BEV start-ups are well-funded, and some are likely to succeed.