VIEWPOINT

The Next Big Disruption in the Auto Industry

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The long gestation period involved in developing new models has not inhibited auto majors from introducing new cars. However, going by the shifts in automobile technology, the next big disruption will likely be the brainchild of technologists. Today, 'computing power' and 'connectivity' are as important as 'horsepower.' The shape of the future automotive will be influenced by the electric, autonomous, connected (EAC) vehicle - a highly configurable and continuously updating platform. The cars of the future will have new features incorporated on a continuous basis (as with smartphones) rather than on a model basis. It will lead to a new ecosystem of suppliers and OEMs partnering with technology partners and create new business models. The entire value chain may be disrupted, with new laws promulgated in the areas of safety regulations, cyber security, and data privacy.

While there have been significant hardware improvements, especially in the areas of material science and design techniques, they have not kept pace with the innovation for the car's software. The software will become the binding interface between the driver and the hardware.

The millennial generation – the dominant demographic among automobile buyers - value connectivity and computing power when making purchase decisions. Though car buyers expect the same now, they do not have the luxury of receiving constant upgrades to the existing technology; instead they need to visit the car dealership for every successive update. The future buyer will look forward to software upgrades (just as it happens on a mobile phone), which will provide a superior experience. The automotive industry is gravitating towards making cars where software can be updated without necessitating a change in hardware or a visit to the dealer.

Another significant requirement of millennials is a smooth transition from outside the car to the inside, and vice versa. Staying connected is a way of life for them. While today's cars have the provision of pluggable devices connecting to the car, this concept has not become a reality. The automobile of the future, driven by the Internet of Things (IoT), will be controlled with the buyer's handheld device or voice.

The automotive industry is approaching a tipping point of disruption, with the driverless electric automobile taking shape. The connected car market is currently growing at a five-year compounded annual growth rate of 45% - 10 times faster than the overall car market. It is estimated that 75% of the cars shipped globally in 2020 will be built with Internet-enabled hardware.

Five years ago, navigation systems used to be just another component in the car that OEMs used to outsource from third party vendors. Today OEMs see a greater value in a closer collaboration with 'non-traditional' suppliers such as Sharp, Google (Android Auto), Apple and Nvidia ensuring higher emphasis on quality, usability and performance standards.

An important trend is the emergence of non-traditional companies such as Apple and Google. It points to two shifts: the cars of the future are going to be more electronic than mechanical and the hub of automotive innovation is moving from Detroit to Silicon Valley. According to IHS, 10% to 25% of the cost of making cars and light trucks is now linked to software. Just as non-traditional enterprises revolutionized the smartphone market, they will also disrupt the automotive market. Jen-Hsun Huang, chief executive of chip maker Nvidia Corp, predicts that a disruption, similar to the one of the smartphone, will take place with the car, which will transform into a delightful computer rolling down the street.

Interestingly, modern day high-end cars already have 100 million+ lines of software code under their hood to manage fuel efficiency, performance, and emissions. The emerging driverless automobile will be developed on top of this framework, incorporating Advanced Driver Assistance Systems (ADAS) and eventually self-driving capability using sensors supporting 360-degree scanning, Vehicle-to-Vehicle (V2V) communication systems which prevent collisions and Vehicle-to-Environment communication encompassing traffic, pedestrians, and weather. Initially, the autonomous driving car will be expensive, but the technology driving it will make the car available at a lower price. For instance, the price of the Mercedes-Benz S550's control software could be as much as US$ 23,000, i.e. approximately the price of a midsize car or small sport-utility vehicle. However, within the next ten years the electronics and software controlling a car could be as low as $5500.

While these advanced systems do need core mechanical and automobile engineering, technological expertise to deal with a treasure trove of data is imperial. Logical comprehension and decoding of this large data is very critical for machine learning systems to achieve steady state and adapt to various different situations on the road. Not surprisingly, technology majors such as Google and Apple have such data in abundance compared to traditional OEMs.

In the 1980s, Japanese auto companies anticipated US demand for fuel-efficient cars and launched vehicles that caught Detroit by surprise. Today, the main risk for OEMs is not about an Apple or Google car upending the automobile industry. Rather, the primary risk is that Apple and Google could turn OEMs into mere hardware makers or "mere assemblers" as Charles Fine feared more than 15 years ago. Apple CEO Tim Cook recently said that the automotive industry is ripe for "massive change," with new software, electric motors, and self-driving capability becoming "much more important, in a huge way."

The traditional OEMs are no less confident, with Dieter Zetsche, Chairman of Daimler, declaring, "We do not plan to become the Foxconn of Apple," referring to the Taiwanese company that manufactures iPhones for Apple. Even though they have not been proactive in anticipating the EAC trend, OEMs are responding to the shifts by establishing offices in Silicon Valley.

Toyota plans to open research institutes near Stanford University in Palo Alto, California as well as the Massachusetts Institute of Technology in Cambridge. Similarly, Mercedes-Benz and BMW, followed by Honda, Nissan, and Ford have Silicon Valley on their radar. Volkswagen has gone one step ahead by hiring videogame designers from Electronic Arts and engineers from Walt Disney animation studio, Pixar to work on multimedia systems and autonomous-driving projects. Even automotive suppliers such as Robert Bosch GmbH and Delphi Automotive PLC have Bay Area research outposts.

OEMs have resolved that they will not experience a 'Kodak moment.' The pioneer of photography ignored digital as a disruptive technology, in spite of the fact that a Kodak engineer invented the digital camera. It paved the way for Sony to seize the first-mover advantage. Perhaps the future of the automotive industry will be determined by a partnership of auto OEMs and technology firms for an infinitely smart and advanced car.

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