Top 8 Transformative Technology Predictions for 2018

6-7 February 2018  |  Frankfurt, Germany

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Transformative technologies

• Coming together in new, powerful ways
• Driving innovations that disrupt industries
• Fundamentally changing businesses

What do transformative technologies mean for the automotive industry in the near and long term?

How are transformative technologies converging to reinvent the car?

How are transformative technologies creating changing transportation and logistics?
Top transformative technologies for 2018

- IoT
- AI
- Cloud & Virtualization
- Connectivity
- Machine Vision
- Blockchain
- Robots & Drones
- Ubiquitous Video
Industry innovations in autonomous vehicles, infotainment, natural language processing, and augmented reality, security and access

Compounding adoption of analytics-driven IoT platforms, computing at the edge, and data exchange brokerages (DEBs)

Services enabling improved machine learning and AI, radically transforming business’ usage and understanding of data

AI in new vehicles ADAS or infotainment systems 2015 & 2025

40B IoT devices at the edge between 2018 and 2025

Off-Premises Cloud Services Market – 22% CAGR

$124B CY 2016

$343B CY 2021
IHS Markit 8 key transformative technologies for 2018

Connectivity
A host of other iterations of LTE, from Cat 1 to Gigabit LTE, will serve consumer, enterprise, and IoT use cases before and after 5G is commercially launched.

Computer vision
From facial recognition software to self-driving cars, advanced robotics, and surveillance, this technology will accelerate innovation across multiple industries.

Ubiquitous video
Continued consumption of video, to alter strategies in multiple markets not directly tied to video or display supply chains.

Robots & drones
The potential of robots and drones to transform long-standing business models.

Blockchain
Blockchain-based services beyond financial services are already being deployed and will continue to grow.
Convergent technology cycles cause long-term industry-wide transformations

There is a new wave of transformative technologies with the potential to significantly impact the world around us. The rate at which we see these technologies take hold has grown rapidly in recent years.

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<td>IP Protocol Development</td>
<td>Cable television</td>
<td>Lithium-ion batteries</td>
<td>Increased bandwidth and apps marketplace</td>
<td>Lithium-ion batteries and long-range connectivity</td>
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Email brought instant communication to business processes
24-hour news cycle changed consumption of content
Portable electronics revolutionized availability of technology
- Content streaming business models emerged
- Content changes for mobile consumption
- App marketplace service business models
- Electric vehicle penetration changes market demand for oil
- 'Things' become available to more markets

2018+
Convergence of AI + IoT + Cloud
Convergence of transformative technologies accelerates change
As different transformative technologies come together, impact goes from linear to exponential

A fundamental enabler: connectivity has driven digitization in consumer, commercial and industrial markets for over 20 years

A driver of efficiency and productivity: many industries have realized significant improvements through embedded processing, connectivity and sensors

A critical tool for achieving scale: with maturing and increasingly sophisticated IoT implementations, cloud storage and analytics have become critical

Essentials for data collection: companies are focusing on how they can manage and utilize all of the data they collect with deep learning, machine learning and AI
Why do we care about this?
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Because convergent technology is now impacting the automotive industry
Over the next 20 years where does technology innovation shift the balance of power?

- Consumers (individuals)
- Car manufacturers and tier 1s
- Platforms (i.e. Google)
- Telecom operator
- Governments and municipalities (shared economy)

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https://api.cvent.com/polling/v1/api/polls/sp4rf4mk
The average value of electronic systems per car is growing at over 5% CAGR to over $1,600 by 2022.
This new technology enables new features, but also creates new risks

**Infotainment**
Content through vehicle makes car a multi-use device for consumer (like smartphone)

**Securing the car**
All of this data now makes the car a vulnerable device with critical implications

**Telematics**
Driver more involved with data will customize system upgrades

**Data vendors**
Car becomes new channel to reach consumers for operators and app developers
Connectivity is being widely deployed into cars directly, via OBDs and being brought in by consumer devices

Connectivity is being integrated into cars to support in-vehicle entertainment, provide information about traffic conditions, monitor engine performance and enable the car to respond to its surrounding environment.

In 2018, an estimated 65M connectable devices in the connected car
Connectivity has moved focus from broadcasting, to streaming, to always-on high-bandwidth

Telematics by broadband generation: 2016

- 2G+: 49%
- 3G: 34%
- 3G+: 6%
- 4G LTE: 11%

Telematics by broadband generation: 2023

- 2G+: 0%
- 3G: 2%
- 3G+: 7%
- 4G LTE: 14%
- 4G+: 10%
- 5G: 0%
While automotive may not have the scale of other connected devices, it is now becoming part of the same broader ecosystem.
We can see this reflected in the positioning of in-vehicle app platforms and the increasing positioning of telcos as intermediary telematics platform providers.

- **10M companion apps**
  - 361 models
  - 26 OEMs
  - 28 suppliers

- **100+ apps**
  - 455 models
  - 27 OEMs
  - 36 countries

- **Dozens of apps**
  - 164 models
  - 7 OEMs
  - Kawasaki and Yamaha

- **148 models**
  - 15 suppliers
  - 11 domestic branches
  - 14 international brands
The brief history of internet platform companies is defined by reach, and automotive represents a new location and completely untapped dataset.
Reach confers access to large-scale datasets, which can then be further mined for patterns and trends.
AI use-cases can be leveraged as an entry point for new players into the automotive industry
To provide scale the automotive opportunity is projected to develop at a similar pace to the smart home opportunity.

Smart speaker shipments by platform (millions)

- Amazon Alexa
- Google Assistant
- Apple Siri
- Other
And the broader scale has already been developed in the smartphone market
So what we’ve seen already is the transition from the car as a technology platform to the car as an data-generating connected device.
But technology convergence will have further meaningful, and long-term, impacts on the industry.

- **2010-2015**: Car becomes technology platform & data nodes
- **2015-2020**: Connected car generates big data
- **2020-2025**: Autonomous transportation starts to become a reality
- **2025 & Beyond**: Transportation industry undergoes paradigm shift
But technology convergence will have further meaningful, and long-term, impacts on the industry.
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So what are the key future trends we are looking for in this transition?

- **What is the car? AI key to development for autonomous car**
- **How is the car used? Robots and drones impact transport and logistics**
- **How is the environment impacted? Smart cities**
Key applications within the smart city are influenced by transformative technology and autonomous vehicles

- Deployment of sensors to detect the presence of a vehicle in a parking space to reduce congestion.
- Deployment of sensors or crowdsourcing to collect data on vehicle traffic.
- Vehicle-to-vehicle or vehicle-to-infrastructure communication to improve safety.
- Deployment of ‘smart tickets’ for the purpose of improved transportation.
- Deployment of sensors to detect the presence of a vehicle in a parking space to reduce congestion.
- Deployment of sensors or crowdsourcing to collect data on vehicle traffic.
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Smart city is already driving the development of the next definition of transportation

25.8% of projects: The US is the leading market for mobility and transport.
Latin America is developing more slowly, but has potential for the integration of mobility and security projects.

28.4% of projects: The EU’s funding and environmental goals shape the dynamics of the region.

25.8% of projects: Rapid urbanization and the growing need to improve mobility will drive market growth. Competition among leading cities will increase momentum.

22.5% of projects: Early-stage development with oases of mobility and transport leadership, such as Dubai.