DIGITAL OUTLOOK

AUTOMOTIVE INDUSTRY

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INTRODUCTION

The automotive industry is caught between a number of evolutionary and revolutionary trends. From executives anticipating major business model disruptions to many being convinced that data will power these new business models, and the majority agreeing that the automobile's digital ecosystem will soon earn more revenue than its hardware, the disruption rages on.

Given that the modern automobile is a computer on wheels, what does the industry feel about digital technology? What are the technology trends that will make the greatest impact on the business? How equipped are automobile companies to take advantage of these trends? To understand what was top of mind in the automotive sector heading into the New Year, we surveyed 1,000 senior decision makers from business and IT, from large organizations (with 1,000 employees or more and annual revenue of at least US$500 million) in nine industries, including 110 respondents from the automotive industry.

While identifying the key digital technology trends was the most important objective of the study, it was not the only one. The survey also sought to understand which digital technologies were in use within automotive companies and the broad purpose for which they had been deployed – improve existing operations, solve new problems, or create new opportunities.

It then reviewed these findings against current and immediate investments in digital technologies to understand where the money was actually going.

The research findings were supplemented with our own perspective on the automobile sector and anecdotes about the happenings in the industry to produce this short but incisive report.

EXECUTIVE SUMMARY

- According to the automotive companies surveyed, investing in technologies for digital supply chains (57 percent), environment-friendly automobiles (56 percent), and autonomous vehicles (56 percent) are the most common trends which will make a positive impact on their organization within the next three years.
- Artificial intelligence (71 percent), 3D printing (66 percent), and cyber security (57 percent) are the digital technologies being utilized the most by automobile companies today.
- Automobile manufacturers plan to invest in digital technologies in the next 12 months. Connected cars (67 percent), autonomous vehicles (66 percent), and digital supply chains (65 percent) are currently receiving investments from most enterprises who consider them a trend for the coming three years.
- Almost all automotive industry respondents said that their organization could improve both existing skills and technologies in preparation for implementing the top trends.

TOP AUTOMOTIVE TRENDS FOR THE NEXT THREE YEARS

1 DIGITAL SUPPLY CHAINS

2 CLEAN TECHNOLOGIES

3 AUTONOMOUS VEHICLES

A diverse set of digital trends, from smart factories to car-as-a service solutions, entered the conversation. When asked to name the trends with the greatest positive impact on the organization in the next three years, the respondents mentioned the following (only those named by 30 percent or more are listed below, and not showing the three most commonly chosen):

a. Investment in technologies to deliver and manage just-in-time inventory.

b. Investment in direct to consumer data collection, analyses, and data-based insights generation.

c. Investment in marketing automation and CRM systems for dealer engagement.

d. Investment in smart factories that use artificial intelligence (AI), algorithms and robotic process automation to run a variety of operational processes, and employ robots to work alongside staff on the shop floor.

e. Investment in building richer connected car features.

f. Investment in the sharing economy and car-as-a service solutions.

On average, each automotive respondent named four items in their list of trends that will make a significant positive impact on their organization in the next three years. And the three trends receiving the most mentions – cited by 57, 56, and 56 percent of the respondents, respectively, as making a positive impact on the business – show that automobile companies are quite focused on the revolutionary and disruptive digital trends that are sweeping their business.

Investment in the digital supply chain received the most mentions – from 57 percent of the respondents. Investment in environment-friendly automotive technologies and autonomous vehicle technology were each mentioned by 56 percent of the respondents as trends making the greatest impact on their organization in the next three years.

Which of the following trends will have the most positive impact on your organization within the next three years?

Investment in digital supply chain	**57%**
Investment in autonomous vehicle technology	**56%**
Investment in technology to make automotive more environment-friendly	**56%**
Investment in technology to deliver and manage just-in-time inventory	**50%**
Investment in direct to consumer data collection, analyses, and insights generation	**46%**
Investment in marketing automation and CRM systems for dealer engagement	**43%**
Investment in smart factory	**43%**
Investment in building richer connected car features	**41%**
Investment in the sharing economy and car-as-a-service solutions	**35%**
Investment in augmented reality based virtual showcases and virtual showrooms	**18%**
Average number of trends that will have a positive impact on respondent's organizations within the next three years	**4**

Let us talk a little bit about the top three most commonly reported trends.

1 Supply Chains Go Even More Digital

The supply chain is the lifeblood of the automotive industry. Original equipment manufacturers (OEMs) have highly complex supply chains that source thousands of components from around the world. Over the years, the supply chain transitioned from paper based processes to IT enabled operations, and is now well on its way to becoming fully digital, standing on a pillar of Web-enabled capabilities. The digital supply chain relies on technologies such as the Internet of Things, social media, mobility, analytics, and AI to connect entities, systems, and processes (planning, supply, manufacturing, and logistics) within and outside its ecosystem. The result is high visibility and seamless data flow that not only helps to improve and automate processes and decisions, but also paves the way for future business models. For example, at an automotive plant owned by robotics company Kuka, which produces Jeep Wrangler bodies, 60,000 devices connect to a central data management system. The system maintains detailed production and quality control records that can be retrieved at any time in the future, should a problem arise. And Volkswagen has set up an open platform called Discovery – a single repository of all information pertaining to different parts and their suppliers – to send pickup and arrival data about inbound parts to various suppliers and carriers.

One respondent in the qualitative portion of the study described a digital supply chain as a system that is able to gather all the data from engineering, from the plant, from the quality, commerce, or logistics. Their belief is that one unique system would provide better communication and collaboration within their organization.

Automobile makers are also collaborating together and with third parties, such as logistics companies, to leverage in-vehicle telematics systems to track cars and communicate within the supply chain. In the future, the industry might use technologies like virtual reality and digital twins to simulate and validate supply chain processes before they are actually executed.

2 Clean Technologies Are In Focus

The automobile industry has been one of the drivers of clean-tech development in recent years, accounting for one in five patents awarded between 2011 and 2016. 2017 turned out to be a big year for environment-friendly automotive technologies, when, anticipating the autonomous vehicle wave, every major carmaker from General Motors to Toyota announced an electric vehicle program. Mercedes-Benz, for example, said it would offer 50 electric versions of all its cars by 2022, while General Motors plans to add 20 new electric and fuel cell vehicles by 2023.

Europe is expected to become a big market for clean-tech automobiles; France and Britain will not allow gasoline-powered cars after 2040. In the United Kingdom clean-tech is gaining a lot of support from consumers, who are switching to electric and other environment-friendly cars; in October 2017, demand for hybrid and electric cars rose 37 percent, while the demand for diesel fell by nearly 33 percent. Europe's inclination towards clean technologies was evident in our survey too, where Germany (80 percent) and the United Kingdom (73 percent) recorded the maximum percentage of respondents including investment in environment-friendly technologies in their list of most impactful trends.

3 The Industry Readies Itself For Autonomous Vehicles

The self-driving car is one of the most disruptive innovations in recent times. A 2017 report on the autonomous vehicle market predicted that global revenue would grow 39.6 percent each year between 2017 and 2027 to touch US$126.8 billion. Current timeline estimates for commercialization of automated driving features forecast high or full automation by 2020.

A number of trends are at play in the growth of autonomous vehicles. Consumer preference for ride sharing services for their ease and affordability, desire for cleaner automotive options, and advances in digital technologies, such as AI, are some of the biggest drivers. Worldwide, manufacturers are investing big sums in developing autonomous cars – a longstanding research institution calculated US$80 billion worth of investments in 160 deals between August 2014 and June 2017.

In a deal that could amount to US$1.4 billion, Uber will buy several thousand self-driving cars from Volvo between 2019 and 2021. Fiat Chrysler, BMW and Intel are collaborating to build an autonomous driving platform with the aim of supplying the technology to automobile companies, while Audi and Nvidia are launching a driverless car by 2020. And Tesla has announced that all its cars will be driverless by 2019.

DIGITAL TECHNOLOGIES THAT AUTOMOTIVE COMPANIES USE – AI, 3D PRINTING, CYBER SECURITY, AND CLOUD

Automotive companies utilize six digital technologies on average. The most deployed technologies in the industry are AI, 3D printing, cyber security, and enterprise cloud, in use at 71, 66, 57, and 57 percent of companies, respectively.

Which of the following digital technologies does your organization currently utilize?

AI (machine learning, deep learning, natural language processing, natural language generation, and visual recognition)	71%
3D printing	66%
Cyber security	57%
Enterprise cloud	57%
Big data analytics	55%
ERP and enterprise application implementation/modernization	46%
Internet of Things	45%
Enterprise service management solutions	45%
Business process management solutions	43%
APIs	42%
Dev-ops and agile	39%
Blockchain	32%
Mainframe modernization	20%

For automotive manufacturers, the most important purpose of implementing these technologies is to improve existing business operations and then to solve new business problems. In the case of AI though, the survey respondents gave almost equal importance to improving existing business operations (54 percent), solving new business problems (54 percent), and creating new opportunities (49 percent).

When the following areas of digital technologies and solutions were implemented within your organization, was it to improve existing business operations, solve new kinds of business problems, or create new opportunities?

	Improve existing business operations	Solve new business problems	Create new opportunities
3D printing	68%	41%	38%
AI (machine learning, deep learning, natural language processing, natural language generation, and visual recognition)	54%	54%	49%
APIs	57%	54%	26%
Big data analytics	57%	53%	42%
Blockchain	54%	51%	26%
Business process management solutions	70%	51%	36%
Cyber security	67%	57%	33%
Dev-ops and agile	60%	47%	33%
Enterprise cloud	63%	46%	33%
Enterprise service management solutions	59%	57%	33%
ERP and enterprise application implementation/ modernization	73%	47%	37%
Internet of Things	58%	50%	40%
Mainframe modernization	77%	36%	59%

WHERE AUTOMOTIVE COMPANIES ARE INVESTING – AI AND 3D PRINTING

Automotive organizations plan to invest in digital technologies in the next 12 months.

Where are they putting this money? Are they investing in disruptive technologies to bring totally new possibilities to life or only in tried and tested solutions that keep the business running?

More importantly, are automotive companies putting money into the trends they deemed most significant within the next three years? To understand this, the survey asked the respondents whether they were investigating or investing in the top three trends they had named as having the most impact on their organization in the next three years. Here are the findings.

Not only were most companies already investing in, or planning to invest in the key trends that the respondents believe will have the most positive impact in the next three years, they were also showing similar interest in the other trends on the list.

The trends attracting the maximum investments were richer, connected cars (67 percent), autonomous vehicles (66 percent), and digital supply chains (65 percent), followed by smart factories (56 percent) and direct to consumer data collection, analyses, and insights (55 percent).

As expected, a greater proportion of respondents from Europe – Germany (88 percent) and France (67 percent) – said they were investing in environment-friendly automotive technologies than the industry average (50 percent).

Is your organization investing in or investigating any of the top trends?

	Investing in this trend	Planning on investing in this trend	Investigating this trend	Not investing in, planning on investing in or investigating this trend
Investment in building richer connected car features	67%	30%	3%	-
Investment in autonomous vehicle technology	66%	25%	9%	-
Investment in digital supply chain	65%	24%	10%	-
Investment in smart factory	56%	36%	8%	-
Investment in direct to consumer data collection, analyses, and insights generation	55%	25%	20%	-
Investment in the sharing economy and car-as-a-service solutions	52%	33%	14%	-
Investment in technology to make automotive more environment-friendly	50%	35%	13%	2%
Investment in marketing automation and CRM systems for dealer engagement	47%	47%	3%	3%
Investment in technology to deliver and manage just-in-time inventory	45%	30%	21%	3%
Investment in AR based virtual showcases and virtual showrooms	40%	40%	20%	-

To the question, "Which of the following technologies or solutions will your organization use in order to realize the promise of all of these trends?" the automotive respondents, who believe at least one trend will have a positive impact, answered by naming more or less the same technologies being used the most, namely AI (65 percent), 3D printing (64 percent), cyber security (55 percent), and big data analytics (54 percent).

But overall, how equipped are they to implement these trends? When the survey asked the respondents if they had what it took to implement their top trends, a huge majority said they possibly needed to improve their skills (93 percent) and their technologies further (91 percent).

IN CONCLUSION

2018 will be an important year for the automotive sector, which will spend these 12 months understanding and managing trends, leading it to a very different future state where vehicles will not pollute and will drive themselves, and even factories and supply chains will run on their own, enabled by intelligent automation technologies. The industry is already making the right technology investments to take advantage of these trends, but of its own admission, needs to do more to build up its technological resources as well as its skill sets.

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