

An article from the Economist Intelligence Unit

En route to connected cars

Like the smartphone before it, the connected car may well be a platform for all manner of new services and business models. Carmakers are still figuring out how to address that transformation



For today's buyer, the value of a car is increasingly linked to the digital features it contains, according to Gary Silberg, a partner at management consultancy firm KPMG and author of a recent report, *Your Connected Car is Talking: Who's Listening?*

The average automobile now contains more than 60 wired and wireless connections, from which its on-board computer collects and crunches data from sensors, GPS units, infotainment systems, mobile devices—and increasingly the Internet. All of these “enhance the user experience, making driving easier, safer, more personal, more fun and more productive,” Mr Silberg says.

This user experience is a growing factor in purchasing decisions. A study by Parks Associates, a market analyst, found that nearly two-thirds (64%) of US car owners from broadband-connected households would like at least one Internet-enabled feature in their next car.

Just as smartphones have given rise to new services and disrupted long-standing ones, connected cars could well prove to be the foundation of all manner of new business offerings. Already, insurers are using data collected from in-car sensors to offer

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policyholders pay-as-you-go deals and performance-related premiums. In July 2016 Volkswagen announced a partnership with electronics giant LG to help merge the connected car with the smart home. Meanwhile, thanks to the foundations being laid today, the dream of driverless cars is fast becoming a reality.

However, the IoT Business Index 2017, compiled by The Economist Intelligence Unit and sponsored by ARM and IBM, reveals that the automotive sector is not proceeding as quickly with the Internet of Things (IoT) as many others. The industry's external IoT index figure, which tracks IoT adoption in the context of products and services, is 4.36. This means that the average automotive company is transitioning from the "research" phase into "planning" its IoT deployments. The internal IoT index, which measures adoption in the context of internal operations and processes, is 4.06—that is, closer to "research" than "planning". Both these index figures are behind the cross-industry averages (see chart).

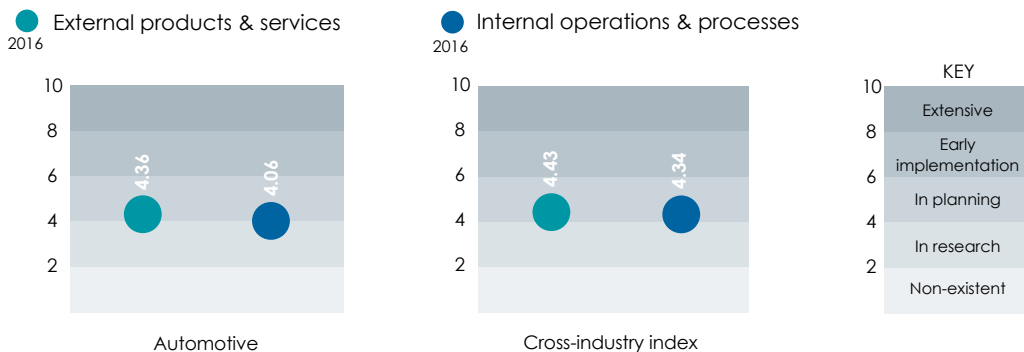
This does not reflect a lack of faith in the concept. Twenty-seven percent of automotive executives surveyed for the index believe that the IoT has already had a major impact in the industry, and a further 32% believe it will in the future. And nearly half (47%) say their organisation plans to increase its investment in the IoT by 11% or more in the next three years, a higher proportion than in any other sector.

Instead, it is more likely to be a reflection of the particular challenges that the industry faces with respect to digital transformation.

According to Jeff Owens, chief technology officer at Delphi Automotive, a manufacturer of auto parts and supplier to some of the world's biggest automotive companies, chief among these is the shift in mindset that requires carmakers to devote an increasing amount of time and effort to software engineering.

In particular, he says, in the race to satisfy drivers' appetites to extend their digital lifestyles to the driving experience, there's a huge R&D focus on finessing the interfaces they see both on the integrated centre stack (that area mid-dashboard where the radio used to sit); the driver instrument cluster that lies directly behind the steering wheel; and increasingly, head-up displays (HUDs) that convey information at a quick upward glance.

The IoT business index for the automotive industry



Source: Economist Intelligence Unit, 2016.

"It's all about delivering rich and appealing graphics and easy-to-navigate menus, which make immediate sense to the driver and which don't present a source of frustration, or worse, distraction," he says. Information must be packed into a relatively small space, but at the same time, he adds, "the driver must be given every opportunity to keep their hands on the wheel, their eyes on the road and their minds on the mission".

It also means partnering with technology companies outside their traditional domain, says Henry Bzeih, managing director, connected and mobility division at Kia Motors. "We know we can't do it all ourselves," he comments. "There's a lot of cloud-based technology behind today's connected car that powers the in-car experience, and we have to partner with the companies that provide it to increase the flexibility we offer to drivers in ways that are helpful to them."

This question of partnering with technology companies presents carmakers with a strategic quandary: do they adopt mature platforms from the likes of Apple and Google to get the functionality customers want into the market—but in doing so cede the guiding hand of innovation? Or do they invest in developing connected features themselves—and thereby try to compete with the giants of the Internet? Carmakers are certainly not shying away from investment: the top five manufacturers spent US\$46bn on R&D in 2015, according to professional services company PwC. But the eventual structure of the connected-car ecosystem is as yet unclear, making it hard for carmakers to advance their ambitions.

There is also the issue of data security and privacy to consider. One-fifth of automotive executives surveyed for the index identify concerns about security and privacy as one of the chief challenges their organisation faces in engaging with the IoT.

This is not a new concern, but it is certainly one that has weighed heavily on the minds of car buyers since *Wired* magazine demonstrated how two hackers were able to "hijack" a Jeep SUV over the Internet back in 2015, according to Alan Stevens, chief scientist and research director at the Transport Research Laboratory, a UK-based consultancy.

"That was a big wake-up call, both for the automotive industry and for its consumers," he says. "As a result, there's something of an arms race going on now in automotive, because there's a realisation that the internal buses that underpin modern vehicle connectivity may not offer the same security protections as many other connected devices."

"Just as default passwords have been shown to represent 'weak points' for many kinds of IoT devices, the same problems seem to exist in many vehicles on the road today," he continues.

Then there's the issue of connectivity, Professor Stevens adds. Many in-vehicle services continue to rely on their owners having Internet access, often through their smartphones, and being prepared to foot the bill for mobile data charges. This can be problematic, he points out, especially when cars are in low-coverage areas. So as well as mobile data standards such as 3G, 4G and, in future, 5G, carmakers are keeping their eye on alternative emerging connectivity standards such as ITS 5G, which proposes short-range communications delivered by roadside beacons, to ensure connected cars stay connected.

A further, critical challenge relates to the IoT's transformational impact. Connectivity does not just impinge on the driver experience but also on patterns of vehicle ownership and usage. The combination of connected cars and online services calls the idea that every household needs a car into question.

Paul DeLong, CEO of car2go, a car-sharing service pioneered by German automotive manufacturer Daimler, believes that modern carmakers need to think less in terms of capturing the revenue that a one-off purchase of an automobile provides and more in terms of the recurring revenue provided by the use of that automobile.

"What we've already shown at car2go is that there are different new ways for the automotive industry to serve different communities, especially urban populations," Mr DeLong says. Daimler now sees itself as "a mobility company, not a car company".

The need for automotive companies to transform their products, their internal operations, their business models and—like Daimler—their own self-image will only increase as driverless cars mature. As that happens, basic assumptions that the industry has taken for granted for nearly a century will be rendered obsolete. Not every carmaker will be able to make the transition but, as the IoT index reveals, many are eager for the challenge and are investing accordingly. That suggests many will. ■

About this article

This article accompanies The Internet of Things Business Index 2017: Transformation in motion, an investigation of business adoption of the Internet of Things (IoT), conducted by The Economist Intelligence Unit and sponsored by ARM and IBM. It draws on a global survey of 825 executives from a range of industries, including 75 from the automotive sector. Responses to a subset of survey questions were used to calculate two index scores: one for the external use of IoT (i.e. with respect to products and services), and the other for the internal use (i.e. with respect to internal operations and process). The index score for each industry represents the average stage of progress for companies in that industry. For more details on the survey and index methodology, read the full The Internet of Things Business Index 2017: Transformation in motion report.

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