Transforming Carmakers Into Powerful Data-Driven Businesses

A roadmap to unlocking new revenue opportunities and achieving competitive advantage in a fast-evolving ecosystem
Unlocking the True Value of Data

Traditional carmakers are already under pressure to re-invent themselves. They need to become software-driven companies to compete in a fast-changing market shaped by next-generation connectivity, autonomous technologies, electrification and shared mobility. Key to their success will be a need to simultaneously focus on data.

Most sectors and industries are in the throes of digital transformation where one of the paybacks is generating data that will drive continuous improvement, bringing them closer to customers and signposting new revenue opportunities. The car industry may be behind the curve, but with in-car connectivity now commonplace and the arrival of 5G imminent, data-driven business models need to be factored into everything they do.

According to McKinsey, car-generated data will be a $450-750 billion market by 2030. The challenge for carmakers is to ensure they have a slice of the revenue, because a battle is underway in a market that has moved away from simpler times, when manufacturers were in control of their own future. Today, high-tech internet companies, MNOs (Mobile Network Operators) and third parties from multiple sectors have services to sell and have set their sights on staking a claim in the connected car ecosystem.
Global technology companies pose a particular threat with cloud platforms and business models predicated on harvesting huge volumes of data. They are masters of fast-growing ecosystems. Vehicles look like the new frontier, mobile phones on wheels, a natural extension of their domains. Carmakers must respond and put themselves at the centre of new revenue models and secure a share of wallet – the key is the data they control and the partnerships they forge to extract value from it.

The immediate challenge is transitioning from decades building iconic car brands with engineering excellence to more software-driven design. Many manufacturers are well advanced on a journey that requires culture change on a massive scale and depends on developing core expertise internally. They have to overcome technical challenges, embed software and new electrical/electronic (E/E) architectures in their manufacturing processes; essentially they have to build different kinds of vehicles. Tesla has disrupted the market by doing it from scratch. Now traditional car manufacturers must follow a similar path.

Building software expertise is one thing, having the capability to harvest the data and apply data analytics is another. Here they will need external help. Part of the challenge is collecting and collating data from a range of vehicles across the globe. Having the key requirements would be a big test for a technology company, let alone a car manufacturer.
CONNECTED CAR ECOSYSTEM

Each of these technologies demands specialist knowledge and an ability to seamlessly integrate them. Not only does it need a deep understanding of network and device functionality, it requires expertise in the data pipeline, the journey of raw data from multiple sources to data lakes and warehouses, where BI (Business Intelligence) tools are used to surface insights in reports and dashboards. This is not an ecosystem that a vehicle manufacturer can easily build.

Sensors to provide data points
The number of in-car systems and sensors is expected to grow and expand from standard mechanical functions like brake and wheel performance to more sophisticated tasks: radar for early hazard warnings, ultrasonic for object detection, cameras, lidar and odometry for autonomous vehicles. Each provides data points that can be accessed for a range of short and long-term insights. The ability to identify the sources for all this vehicle-generated data will be a major transformation in automotive moving forward.

Compute power to process data
Capturing data is only one challenge; processing it is another. A revolution is underway in connectivity, data centres and high performance computing that will be instrumental in how connected car data is processed. 5G will leverage small cells and take radio processing from the base station to the edge, where micro data centres will have the compute power to process some of the raw data. Otherwise, high-performance computing systems will be required to integrate into a vehicle for raw sensor data processing locally, and will be transmitted over 5G to the cloud.

Turning data into insights with AI and machine learning
Using algorithms to build models that draw on multiple data sources is where every business is heading, moving from descriptive to predictive and prescriptive analytics. Descriptive analytics looks back to look forward and relies on historical data, whereas the other methods use modelling techniques to determine what might happen in the future. To do any of it at scale demands a production environment that can make reports available to multiple business units, turning data into insights that can help make informed decisions based on evidence, not a hunch.
LEVERAGING MULTIPLE DATA SOURCES FOR BETTER INSIGHTS

Telematics and remote diagnostics provided the first wave of in-car analytics, leveraging data from the electronic control unit (ECU) and supported with over-the-air updates.

Other data sources emerged with Advanced Driver Assisted Systems (ADAS), where sensors and cameras help with parking, respond to obstacles or driver errors – data that could be used for driver training.

Data from infotainment and navigation systems introduces behavioural analysis, along with Human Machine Interface (HMI) data that can be collected and collated from touchscreens, buttons and controllers. Automotive HMI is evolving to improve safety and support human-machine interactions with gesture and speech recognition.

Other data streams will be sourced externally as V2X (Vehicle-to-Everything) services evolve. In smart cities, cars will connect with infrastructure – traffic lights, advertising hoardings, forecourt services, car parks – or with other vehicles, people and devices.

Some of these data sources, like telematics and driver-assistance systems, are already embedded in carmaker product offerings. Others are still being developed and their value to carmakers is still to be determined.

All these developments present both an opportunity and a challenge for carmakers. The opportunity to use data for market differentiation is too big to ignore – particularly as connected services will increasingly inform car buying decisions. The opportunity for new revenue streams is equally prescient, where something like forecourt services could be the basis for new commercial relationships. The challenge is how carmakers can turn data from such disparate sources into insights for competitive advantage.
Cubic Telecom is the central unifying partner in the connected car ecosystem.

Our unique ability to correlate data from multiple sources across global markets gives carmakers the control and visibility they need. We address the complexity of implementing an analytics strategy, providing the software and connectivity to access data across a range of vehicle models and IoT devices over mobile networks in multiple territories.

**Vehicles**
We can access data related to different models from the same manufacturer, enabling make and user demographic analysis. Understanding end-user behaviour will be essential as in-car connectivity services flourish. We can provide real-time macro and micro monitoring from the in-car sensors, ensuring quality of service and enabling service prioritisation. Carmakers can then match bandwidth to services by analysing customer behaviour.

**Mobile Networks**
We provide granular insights of performance and bandwidth utilisation across different territories. Local mobile operators can share group usage in a country, but not on a per vehicle basis or with wider context. We can correlate car models with network performance to identify technical variables or analyse usage that indicates how different types of customers favour different models and services.

**IoT Devices**
We are able to analyse the performance of a particular device or compare sensors to arrive at a better understanding of the effectiveness of each component. Carmaker procurement decisions will be informed by data from all the variables – the car model, the network in different territories, the services in smart cities, and how effectively each device integrates with other components in the ecosystem.
Car manufacturers, like businesses in other sectors, are aware of the value of data and that the value rises exponentially with sources and volume — just as long as they can find a way to process and analyse it at scale. By 2030, KPMG estimates that around 4,000 gigabytes of data per day will be generated by a single autonomous vehicle. The challenge of processing it is compounded in the car industry where accessing data depends on mobile networks that vary from country to country.

There is a multitude of data available to help carmakers better understand their customers but its magnitude and complexity limits their ability to collect, analyse and act on it. Carmakers do not have full control or access to data from external or internal sources; where data does exist it’s often trapped in silos across different parts of the organisation.

As with other sectors, the cloud is increasingly recognised as the solution. Cubic is a cloud software company, which means we have the scale and flexibility to take advantage of the growing volumes of data and the new service opportunities created by connected vehicles. At the same time, we take advantage of networks that are increasingly software-driven and leverage NFV (Network Functions Virtualisation), where virtualisation liberates the infrastructure from hardware constraints.

Because we identify and control traffic at a network packet level, Cubic can stand over data streams going in and out of the car, providing manufacturers with a real-time view of network traffic regardless of the network operator. We enable a complete view over a fleet of cars or go micro and dig down into a single vehicle view - globally or in specific countries - on a particular network. We work with our MNO partners to take analysis down to cell site ID level if necessary.
The Cubic connectivity management platform – PACE – connects vehicles in multiple countries and provides carmakers with access to rich data sources in a fully managed cloud environment that is secure, scalable and accessible from anywhere. Carmakers can use it to orchestrate data management solutions, integrating telemetry and technical performance data with new sources, such as bandwidth usage related to in-car activity.

Cubic’s INSIGHTS solution couples technical and quality of service data with behavioural analysis of end-users. Carmakers have a powerful 360-degree view of their vehicles and unique insights into what works and what doesn’t. Data can be shared by dashboards and reports for different user groups.

With Cubic’s PLXOR solution, deep insights are available into end-user activity and the way people interact with vehicles and connected services. Vehicle attributes, for example, can be attached to a network instance such as an outage, providing granular insights that would not previously have been visible.

CUBIC ENABLES

- Network traffic classification and network performance analysis
- Global systems monitoring and reporting
- Behavioural analysis related to in-car services
Our cloud platform can scale with our clients as the adoption of electric and autonomous cars generates more V2X data. There will be accelerated demand for data collection and analysis as more use cases and business models emerge — our platform is ready.

Cubic’s unique ability to collect and collate network, vehicle, and end-user data will deliver a range of benefits to carmakers:

- Access more insights faster for data-driven decision-making
- Correlate data from network, vehicle and device for multiple insights
- Use data from real-time events to proactively manage performance
- Develop a deep understanding of market segmentation
- Trigger proactive alerts and reporting that drives continuous improvement
- Identify emerging trends and new business opportunities
- Leverage historical data for predictive analytics and strategy planning

Data sourced and managed by Cubic will drive profits as the automotive value chain evolves. Intellectual property will become important as new business models and partnerships are formed; valuable new revenue streams will be opened up around Mobility-as-a-Service and infotainment propositions. Crucially, carmakers will have the insights and knowledge to secure their place at the centre of a fast-changing market. They can take control with Cubic, and keep it.
ABOUT CUBIC

Cubic Telecom delivers innovative IoT connected software solutions to Automotive, Agriculture, and Transport manufacturers. Its ecosystem of revenue-generating services combines real-time analytics with global connectivity in 190 countries, always aligned to regional regulatory requirements.

Its global connected software platform PACE is used by leading companies around the world including Audi, Microsoft, Kymeta, Panasonic Automotive, Volkswagen, CNH Industrial, Skoda, e.GO Mobile and Arrival.

Headed by CEO Barry Napier, the company is privately held with over €110 million in funding by Audi Electronics Venture GmbH, Qualcomm, Valid, the European Investment Bank, Enterprise Ireland, and the Ireland Strategic Investment Fund, among others.
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